



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	11/28/2017	9826686	78873.176US2	8522

34018 7590 11/08/2017  
Greenberg Traurig, LLP  
77 W. Wacker Drive  
Suite 3100  
CHICAGO, IL 60601-1732

### ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

#### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Toshinari Yamaoka, Nanjing, CHINA;  
CHERVON INTELLECTUAL PROPERTY LIMITED, Road Town, VIRGIN ISLANDS, BRITISH;  
Fangjie Nie, Nanjing, CHINA;  
Haishen Xu, Nanjing, CHINA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](http://SelectUSA.gov).

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>SUPPLEMENTAL</b>		<b>Attorney Docket Number</b>	78873.176US2
<b>Application Data Sheet 37 CFR 1.76</b>		<b>Application Number</b>	15/250,408
<b>Title of Invention</b>	GARDENING TOOL		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

## Inventor Information:

<b>Inventor 1</b>					<b>Remove</b>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Toshinari		Yamaoka		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>		16-704 Renheng Bamboo Garden, No. 5 Yulan Road			
<b>Address 2</b>		Yuhua District			
<b>City</b>	Nanjing	<b>State/Province</b>			
<b>Postal Code</b>			<b>Country <sup>i</sup></b>	CN	
<b>Inventor 2</b>					<b>Remove</b>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Fangjie		Nie		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>		Room 402 Biboge, Culture Country, No. 88 Tianyuan Rd			
<b>Address 2</b>		Jiangning District			
<b>City</b>	Nanjing	<b>State/Province</b>			
<b>Postal Code</b>			<b>Country <sup>i</sup></b>	CN	
<b>Inventor 3</b>					<b>Remove</b>
<b>Legal Name</b>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>SUPPLEMENTAL</b>		Attorney Docket Number	78873.176US2
<b>Application Data Sheet 37 CFR 1.76</b>		Application Number	15/250,408
Title of Invention	GARDENING TOOL		

<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>
	Haishen		Xu	
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN	
<b>Mailing Address of Inventor:</b>				
<b>Address 1</b>	Room 302, No. 32, Rehe South Road			
<b>Address 2</b>	Xiaguan District			
<b>City</b>	Nanjing	<b>State/Province</b>		
<b>Postal Code</b>		<b>Country <sup>i</sup></b>	CN	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button. <div style="text-align: right;"><b>Add</b></div>				

### Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.	
<b>Customer Number</b>	34018
<b>Email Address</b>	chiipmail@gtlaw.com
<div><b>Add Email</b></div> <div><b>Remove Email</b></div>	

### Application Information:

<b>Title of the Invention</b>	GARDENING TOOL		
<b>Attorney Docket Number</b>	78873.176US2	<b>Small Entity Status Claimed</b>	<input type="checkbox"/>
<b>Application Type</b>	Nonprovisional		
<b>Subject Matter</b>	Utility		
<b>Total Number of Drawing Sheets (if any)</b>	6	<b>Suggested Figure for Publication (if any)</b>	

### Publication Information:

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

### Representative Information:

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>SUPPLEMENTAL</b>		Attorney Docket Number	78873.176US2
<b>Application Data Sheet 37 CFR 1.76</b>		Application Number	15/250,408
Title of Invention	GARDENING TOOL		

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	34018		

### Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending	<a href="#">Remove</a>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	14511490	2014-10-10

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

### Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)<sup>i</sup> the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

<a href="#">Remove</a>			
Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>i</sup> (if applicable)
201310468919.9	CN	2013-10-10	
<a href="#">Remove</a>			
Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>i</sup> (if applicable)
201410167041.X	CN	2014-04-23	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.



<b>SUPPLEMENTAL</b>		Attorney Docket Number	78873.176US2
<b>Application Data Sheet 37 CFR 1.76</b>		Application Number	15/250,408
Title of Invention	GARDENING TOOL		

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p><input type="checkbox"/> NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p>
--

## Authorization to Permit Access:

<p><input type="checkbox"/> Authorization to Permit Access to the Instant Application by the Participating Offices</p> <p>If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.</p> <p>In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.</p> <p>In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.</p>
---

## Applicant Information:

<p>Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.</p>
--

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>SUPPLEMENTAL</b> <b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	15/250,408
Title of Invention	GARDENING TOOL		

**Applicant 1**

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

- ☒ Assignee
 ☐ Legal Representative under 35 U.S.C. 117
 ☐ Joint Inventor
- ☐ Person to whom the inventor is obligated to assign.
 ☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name CHERVON INTELLECTUAL PROPERTY LIMITED Chervon (HK) Limited

**Mailing Address Information For Applicant:**

Address 1	<u>P.O. Box 957</u>		<u>Room 803B 8/F, Allied Kajima Building</u>	
Address 2	<u>Offshore Incorporations Centre</u>		<u>138 Gloucester Road</u>	
City	<u>Read Town</u>	<u>Wanchai</u>	State/Province	
Country	<u>VG</u>	<u>Hong Kong</u>	Postal Code	
Phone Number			Fax Number	
Email Address				

Additional Applicant Data may be generated within this form by selecting the Add button.

**Assignee Information including Non-Applicant Assignee Information:**

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Assignee 1**

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>SUPPLEMENTAL</b>		Attorney Docket Number	78873.176US2
<b>Application Data Sheet 37 CFR 1.76</b>		Application Number	15/250,408
Title of Invention	GARDENING TOOL		

Prefix	Given Name	Middle Name	Family Name	Suffix

**Mailing Address Information For Assignee including Non-Applicant Assignee:**

Address 1			
Address 2			
City		State/Province	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

**Signature:**

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. 2017-10-24

Signature	<del>/Keith R. Jarosik/</del>	<del>/Keith R. Jarosik/</del>	Date (YYYY-MM-DD)	2016-08-29
First Name	Keith R.	Last Name	Jarosik	Registration Number
				35906 47683

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

34018 7590 07/24/2017  
**GREENBERG TRAURIG, LLP**  
**77 WEST WACKER DRIVE**  
**SUITE 3100**  
**CHICAGO, IL 60601-1732**

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Cynthia Tapia	(Depositor's name)
/Cynthia Tapia/	(Signature)
October 24, 2017	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2	8522

TITLE OF INVENTION: GARDENING TOOL

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/24/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
PEZZUTO, ROBERT ERIC	3671	056-010800

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Greenberg Traurig, LLP

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Chervon (HK) Limited

Wanchai, Hong Kong

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-2428 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Keith R. Jarosik/

Date October 24, 2017

Typed or printed name Keith R. Jarosik

Registration No. 47,683

Electronic Patent Application Fee Transmittal				
Application Number:		15250408		
Filing Date:		29-Aug-2016		
Title of Invention:		GARDENING TOOL		
First Named Inventor/Applicant Name:		Toshinari Yamaoka		
Filer:		Keith Richard Jarosik/Cynthia Tapia		
Attorney Docket Number:		78873.176US2		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				960

Electronic Acknowledgement Receipt	
<b>EFS ID:</b>	30742671
<b>Application Number:</b>	15250408
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8522
<b>Title of Invention:</b>	GARDENING TOOL
<b>First Named Inventor/Applicant Name:</b>	Toshinari Yamaoka
<b>Customer Number:</b>	34018
<b>Filer:</b>	Keith Richard Jarosik/Cynthia Tapia
<b>Filer Authorized By:</b>	Keith Richard Jarosik
<b>Attorney Docket Number:</b>	78873.176US2
<b>Receipt Date:</b>	24-OCT-2017
<b>Filing Date:</b>	29-AUG-2016
<b>Time Stamp:</b>	13:48:22
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$960
RAM confirmation Number	102517INTEFSW00000031502428
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	



<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	078873_176US2SupplADS.pdf	4877395	no	7
			ea9fda40e7eed226e51e2cf201fc48917478e8e6		
<b>Warnings:</b>					
<b>Information:</b>					
This is not an USPTO supplied ADS fillable form					
2	Issue Fee Payment (PTO-85B)	078873_176US2IssueFeeTrans.pdf	100412	no	1
			8dab70b9907af3443fe122d6ea1b9facd8a0f02		
<b>Warnings:</b>					
<b>Information:</b>					
3	Fee Worksheet (SB06)	fee-info.pdf	30598	no	2
			9eb9484c098a9576f940137f1c7f3bf475dd2079		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			5008405		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Toshinari Yamaoka	)	
		)	Examiner: Pezzuto, Robert Eric
Serial No.:	15/250,408	)	
		)	Group Art Unit: 3671
Filed:	August 29, 2016	)	
		)	Atty. Docket No.: 078873.176US2
Title:	GARDENING TOOL	)	

**RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Corrected Application Papers mailed on August 8, 2017, enclosed is the following:

- Replacement Sheet, FIG. 7.

No fee is believed due. However, the Commissioner is authorized to charge any fee deficiency which may be required or credit overpayment to deposit account number 50-2428 in the name of Greenberg Traurig, LLP.

Respectfully submitted,

Date: August 23, 2017

By: /Gary R. Jarosik/  
Gary R. Jarosik, Reg. No. 35,906  
Greenberg Traurig, LLP  
77 W. Wacker Drive/Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

REPLACEMENT SHEET

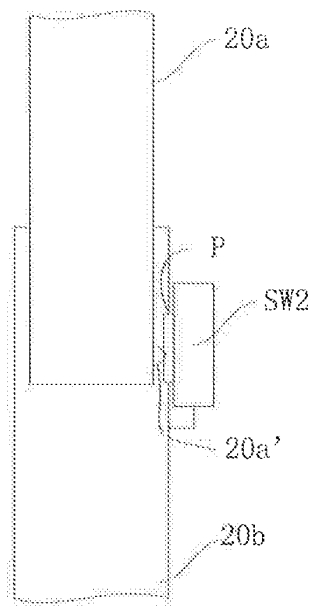


FIG. 6

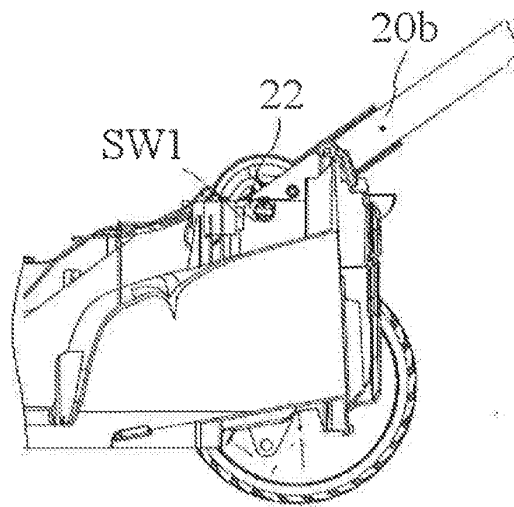


FIG. 7

Electronic Acknowledgement Receipt	
<b>EFS ID:</b>	30159991
<b>Application Number:</b>	15250408
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8522
<b>Title of Invention:</b>	GARDENING TOOL
<b>First Named Inventor/Applicant Name:</b>	Toshinari Yamaoka
<b>Customer Number:</b>	34018
<b>Filer:</b>	Gary R. Jarosik/Cynthia Tapia
<b>Filer Authorized By:</b>	Gary R. Jarosik
<b>Attorney Docket Number:</b>	78873.176US2
<b>Receipt Date:</b>	23-AUG-2017
<b>Filing Date:</b>	29-AUG-2016
<b>Time Stamp:</b>	13:23:26
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	078873_176US2Response.pdf	97354	no	1
			9dde113b28282318f9858855ba7f8f073e081a3		

### Warnings:

<b>Information:</b>					
2	Drawings-only black and white line drawings	078873_176US2Replacement.pdf	272131	no	1
			4a5c0a77b1d10e66b4a58b49941b3b4d9c bfe45c		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			369485		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2	8522
34018	7590	08/08/2017		
Greenberg Traurig, LLP 77 W. Wacker Drive Suite 3100 CHICAGO, IL 60601-1732			EXAMINER PEZZUTO, ROBERT ERIC	
			ART UNIT 3671	PAPER NUMBER
			NOTIFICATION DATE 08/08/2017	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chiipmail@gtlaw.com  
escobedot@gtlaw.com  
jarosikg@gtlaw.com



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

Application No. : 15250408  
Applicant : Yamaoka  
Filing Date : 08/29/2016  
Date Mailed : 08/08/2017

## NOTICE TO FILE CORRECTED APPLICATION PAPERS

### *Notice of Allowance Mailed*

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

**Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.**

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

*A copy of this notice **MUST** be returned with the reply. Please address response to  
"Mail Stop Issue Fee, Commissioner for Patents,  
P.O. Box 1450, Alexandria, VA 22313-1450".*

/Marsha Palmer/  
Publication Branch  
Office of Data Management  
(571) 272-4200

**IDENTIFICATION OF DRAWING DEFICIENCIES**

- ☐ There is a hole or the image thereof within the illustration. FIG(s)
- ☐ The illustration is penetrated or traversed by a solid or broken line that is not intended to be part of the drawing, such as a dark line caused by a flaw in the copying process. FIG(s)
- ☐ An ink stamp or the image thereof obscures part of the illustration. FIG(s)
- ☐ The drawing is marred by black smudges, obliterations, or fax/copier marks (for example, speckles or dots in a substantial portion of the drawing). FIG(s)
- ☐ Figure numbers are duplicated or missing. FIG(s)
- ☐ Drawing sheet or figure is missing. FIG(s)
- ☐ Numbers, letters, or reference characters in the drawing have been crossed out or are illegibly handwritten. FIG(s)
- ☐ The character of the lines, numbers, and letters is poor. FIG(s)
- ☐ The drawing's background shows that the original drawing was made on graph paper or other paper with a pattern or decoration. FIG(s)
- ☐ The FIG. number label is placed in a location that causes the drawing to be read upside down. FIG(s)
- ☒ Data, a reference number, or part of the drawing is truncated or missing, or a lead line has no reference number. FIG(s) 7
- ☐ The drawing and/or the FIG. label contain(s) foreign language. FIG(s)
- ☐ This utility application contains a photograph of a view that is capable of being illustrated as a line drawing. FIG(s)
- ☐ A petition under 37 CFR 1.84(a)(2) to accept color drawings has been granted, but the brief description of the drawings in the specification does not contain (or has not been amended to contain) the paragraph required by 37 CFR 1.84(a)(2)(iii).
- ☐ This reissue application contains added and/or amended drawings that are not labeled as "New" or "Amended" or "Canceled" as required by 37 CFR 1.173(b)(3). FIG(s)
- ☐ This Design reissue application contains a drawing that is labeled as "Canceled" but is not surrounded by brackets, or a drawing that is surrounded by brackets but is not labeled as "Canceled." See 37 CFR 1.173(b)(3). FIG(s)
- ☐ OTHER:
- ☐ COMMENTS:



UNITED STATES PATENT AND TRADEMARK OFFICE  
COMMISSIONER FOR PATENTS  
P.O. BOX 1450  
ALEXANDRIA VA 22313-1451

PRESORTED  
FIRST-CLASS MAIL  
U.S. POSTAGE PAID  
POSTEDIGITAL  
NNNNN

Ring  
c/o Greenberg Traurig, LLP  
77 W. Wacker Drive  
Suite 3100  
CHICAGO, IL 60601-1732



**Courtesy Reminder for  
Application Serial No: 15/250,408**

Attorney Docket No: 78873.176US2

Customer Number: 34018

Date of Electronic Notification: 07/24/2017

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:

jarosikg@gtlaw.com  
chiipmail@gtlaw.com  
escobedot@gtlaw.com

To view your correspondence online or update your email addresses, please visit us anytime at <https://sportal.uspto.gov/secure/myportal/privatepair>. If you have any questions, please email the Electronic Business Center (EBC) at [EBC@uspto.gov](mailto:EBC@uspto.gov) or call 1-866-217-9197.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

34018 7590 07/24/2017  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

EXAMINER

PEZZUTO, ROBERT ERIC

ART UNIT

PAPER NUMBER

3671

DATE MAILED: 07/24/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2	8522

TITLE OF INVENTION: GARDENING TOOL

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/24/2017

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

**PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
or Fax (571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

34018 7590 07/24/2017  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2	8522

TITLE OF INVENTION: GARDENING TOOL

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/24/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
PEZZUTO, ROBERT ERIC	3671	056-010800

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

**NOTE:** Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

**NOTE:** If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

**NOTE:** Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

**NOTE:** This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2	8522
34018 7590 07/24/2017 GREENBERG TRAUIG, LLP 77 WEST WACKER DRIVE SUITE 3100 CHICAGO, IL 60601-1732			EXAMINER PEZZUTO, ROBERT ERIC	
			ART UNIT 3671	PAPER NUMBER

DATE MAILED: 07/24/2017

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>Notice of Allowability</b>	<b>Application No.</b> 15/250,408	<b>Applicant(s)</b> YAMAOKA ET AL.	
	<b>Examiner</b> ROBERT PEZZUTO	<b>Art Unit</b> 3671	<b>AIA (First Inventor to File) Status</b> Yes

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application filed August 29, 2016.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

- a) ☒ All    b) ☐ Some    \*c) ☐ None of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Examiner's Amendment/Comment                  |
| 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date <u>8/29/16, 9/13/16</u> | 6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material                           | 7. <input type="checkbox"/> Other _____.                                  |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____.   |   |

/ROBERT PEZZUTO/  
Primary Examiner, Art Unit 3671

<b>Notice of References Cited</b>	Application/Control No. 15/250,408	Applicant(s)/Patent Under Reexamination YAMAOKA ET AL.	
	Examiner ROBERT PEZZUTO	Art Unit 3671	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-3,659,170 A	04-1972	Burkett; Wilford B.	H02K7/1026	310/77
*	B	US-3,750,378 A	08-1973	Thorud; Richard A.	A01D43/0631	56/10.5
*	C	US-3,942,604 A	03-1976	Black III; Charles E.	B60K28/00	180/19.3
*	D	US-4,833,935 A	05-1989	Roelle; David R.	A01D34/6818	180/19.3
*	E	US-5,203,147 A	04-1993	Long; Charles K.	A01D34/6818	56/10.1
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		15250408
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit	3671	
	Examiner Name		
	Attorney Docket Number	78873.176US2	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6737598		2004-05-18	Allen et al.	
	2	4043102		1977-08-23	Uhlinger et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20140331809	A1	2014-11-13	Mikula et al.	
	2	20140190141	A1	2014-07-10	Edholm et al.	
	3	20140102063	A1	2014-04-17	Yamaoka et al.	
	4	20120317821	A1	2012-12-20	Tsuchiya et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.E.P/



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		15250408	
	Filing Date		2016-08-29	
	First Named Inventor	Toshinari Yamaoka		
	Art Unit	3671		
	Examiner Name			
	Attorney Docket Number	78873.176US2		

	5	20100162674	A1	2010-07-01	Eaton et al.	
	6	20090217636	A1	2009-09-03	Loxterkamp et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

#### FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup>	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1	1299582	CN		2001-06-20	Nanjing Science & Engineering		<input checked="" type="checkbox"/>
	2	101897261	CN		2010-12-01	Ningbo Daye Garden Machinery Co Ltd		<input checked="" type="checkbox"/>
	3	102683052	CN		2012-09-19	Hai An Weishi Heavy Machinery Co Ltd		<input checked="" type="checkbox"/>
	4	201146132	CN		2008-11-05	Guoxiong Hu		<input checked="" type="checkbox"/>
	5	201821663	CN		2011-05-11	Nanjing Chervon Ind Co Ltd		<input checked="" type="checkbox"/>
	6	202873363	CN		2013-04-17	Nanjing Chervon Ind Co Ltd		<input checked="" type="checkbox"/>
	7	102845186	CN		2013-01-02	Nanjing Chervon Ind Co Ltd		<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	15250408
	Filing Date	2016-08-29
	First Named Inventor	Toshinari Yamaoka
	Art Unit	3671
	Examiner Name	
	Attorney Docket Number	78873.176US2

NON-PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>		
	1		<input type="checkbox"/>		
If you wish to add additional non-patent literature document citation information please click the Add button					
EXAMINER SIGNATURE					
Examiner Signature	/ROBERT E PEZZUTO/		Date Considered 07/19/2017		
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.					
<sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.					

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.E.P/

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	15250408
Filing Date	2016-08-29
First Named Inventor	Toshinari Yamaoka
Art Unit	3671
Examiner Name	
Attorney Docket Number	78873.176US2

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☒ See attached certification statement.
- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Gary R. Jarosik/	Date (YYYY-MM-DD)	2016-09-13
Name/Print	Gary R. Jarosik	Registration Number	35906

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Yamaoka et al.	)	
	)	
Serial No.: 15/250,408	)	Examiner:
	)	
Filed: August 29, 2016	)	Group Art Unit: 3671
	)	
Title: GARDENING TOOL	)	Docket No. 078873.176US2

**CERTIFICATION STATEMENT****FILED VIA EFS-WEB**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

The Information Disclosure Statement being filed concurrently herewith should be considered because it is submitted, pursuant to 37 C.F.R. §1.97(b)(3) before the mailing of a first Office Action on the merits. Therefore, no fee is required.

Respectfully submitted,

Date: September 13, 2016

By: /Gary R. Jarosik/  
Gary R. Jarosik, Reg. No. 35,906  
Greenberg Traurig, LLP  
77 W. Wacker Drive - Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

CHI 67397864v1

-----  
Certificate of Electronic Transmission: The undersigned hereby certifies that this document and its attachments are being transmitted electronically via EFS-Web to the United States Patent and Trademark Office on this 13<sup>th</sup> day of September, 2016.

By: /Cynthia Tapia/  
Name: Cynthia Tapia




## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 www.uspto.gov

## BIB DATA SHEET

CONFIRMATION NO. 8522

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
15/250,408	08/29/2016	056	3671	78873.176US2		
<b>APPLICANTS</b> CHERVON INTELLECTUAL PROPERTY LIMITED, Road Town, VIRGIN ISLANDS, BRITISH; <b>INVENTORS</b> Toshinari Yamaoka, Nanjing, CHINA; Fangjie Nie, Nanjing, CHINA; Haishen Xu, Nanjing, CHINA; <b>** CONTINUING DATA *****</b> This application is a CON of 14/511,490 10/10/2014 PAT 9596806 <b>** FOREIGN APPLICATIONS *****</b> CHINA 201310468919.9 10/10/2013 CHINA 201410167041.X 04/23/2014 <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 09/08/2016						
Foreign Priority claimed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 35 USC 119(a-d) conditions met <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Verified and /ROBERT ERIC PEZZUTO/ Acknowledged Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	<b>STATE OR COUNTRY</b> CHINA	<b>SHEETS DRAWINGS</b> 6	<b>TOTAL CLAIMS</b> 20	<b>INDEPENDENT CLAIMS</b> 2
<b>ADDRESS</b> GREENBERG TRAURIG, LLP 77 WEST WACKER DRIVE SUITE 3100 CHICAGO, IL 60601-1732 UNITED STATES						
<b>TITLE</b> GARDENING TOOL						
<b>FILING FEE RECEIVED</b> 1600	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

<b>Search Notes</b>  	<b>Application/Control No.</b>  15250408	<b>Applicant(s)/Patent Under Reexamination</b>  YAMAOKA ET AL.
	<b>Examiner</b>  ROBERT PEZZUTO	<b>Art Unit</b>  3671

CPC- SEARCHED		
Symbol	Date	Examiner
A01D 43/0631,34/63,34/475,34/6806,34/6818,34/828,34/78,34/824,34/67,69/10,69/02,203 4/6843,2101/00	7/18/17	/RP/
B60K 28/00,28/04	7/18/17	/RP/
B62D 51/002	7/18/17	/RP/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
56	10.1,10.5,10.8,17.4,320.2	7/18/17	/RP/
180	19.3,272	7/18/17	/RP/

\* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
East search	7/18/17	/RP/
Inventor name search	7/18/17	/RP/


<b>INTERFERENCE SEARCH</b>
----------------------------

	/ROBERT PEZZUTO/ Primary Examiner.Art Unit 3671
--	--

<b>US Class/ CPC Symbol</b>	<b>US Subclass / CPC Group</b>	<b>Date</b>	<b>Examiner</b>
56	10.8	7/19/17	/RP/
A01D	69/10,69/02,34/824	7/19/17	/RP/
PGPubs		7/19/17	/RP/

	/ROBERT PEZZUTO/ Primary Examiner.Art Unit 3671
--	--




<b>Issue Classification</b> 	<b>Application/Control No.</b> 15250408	<b>Applicant(s)/Patent Under Reexamination</b> YAMAOKA ET AL.	
	<b>Examiner</b> ROBERT PEZZUTO	<b>Art Unit</b> 3671	

CPC					
Symbol				Type	Version
A01D	69	10		F	2013-01-01
A01D	69	02		I	2013-01-01
A01D	34	824		I	2013-01-01
A01D	34	67		I	2013-01-01
A01D	34	6806		I	2013-01-01
A01D	34	828		I	2013-01-01
A01D	2034	6843		A	2013-01-01
A01D	2101	00		A	2013-01-01

CPC Combination Sets					
Symbol	Type	Set	Ranking	Version	

NONE		<b>Total Claims Allowed:</b>	
		20	
(Assistant Examiner)	(Date)		
/ROBERT PEZZUTO/ Primary Examiner.Art Unit 3671	7/19/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2&9

<b>Issue Classification</b> 	<b>Application/Control No.</b> 15250408	<b>Applicant(s)/Patent Under Reexamination</b> YAMAOKA ET AL.
	<b>Examiner</b> ROBERT PEZZUTO	<b>Art Unit</b> 3671

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION													
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED								
56			10.8			A	0	1	D	34 / 63 (2006.01.01)									
CROSS REFERENCE(S)						A	0	1	D	69 / 10 (2006.01.01)									
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		

NONE		<b>Total Claims Allowed:</b>	
		20	
(Assistant Examiner)	(Date)		
/ROBERT PEZZUTO/ Primary Examiner.Art Unit 3671	7/19/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2&9



Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date		2016-08-29	
	First Named Inventor	Toshinari Yamaoka		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		78873.176US2	

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S.PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.								
FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2i</sup>	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1	0903074	EP	A1	1999-03-24	Wolf Outils		<input type="checkbox"/>
If you wish to add additional Foreign Patent Document citation information please click the Add button								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T <sup>5</sup>

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.E.P/

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	78873.176US2	

	1		<input type="checkbox"/>
--	---	--	--------------------------

If you wish to add additional non-patent literature document citation information please click the Add button

#### EXAMINER SIGNATURE

Examiner Signature	/ROBERT E PEZZUTO/	Date Considered	07/19/2017
--------------------	--------------------	-----------------	------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.E.P/

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	2016-08-29
	First Named Inventor	Toshinari Yamaoka
	Art Unit	
	Examiner Name	
	Attorney Docket Number	78873.176US2

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Keith R. Jarosik/	Date (YYYY-MM-DD)	2016-08-29
Name/Print	Keith R. Jarosik	Registration Number	47683

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Yamaoka et al.	)	
	)	
Serial No.: Filed herewith	)	Examiner:
	)	
Filed: Filed herewith	)	Group Art Unit:
	)	
Title: GARDENING TOOL	)	Docket No. 078873.176US2

**CERTIFICATION STATEMENT****FILED VIA EFS-WEB**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

The Information Disclosure Statement being filed concurrently herewith should be considered because it is submitted, pursuant to 37 C.F.R. §1.97(b)(3) before the mailing of a first Office Action on the merits. Therefore, no fee is required.

Respectfully submitted,

Date: August 29, 2016

By: /Keith R. Jarosik/  
Keith R. Jarosik, Reg. No. 47,683  
Greenberg Traurig, LLP  
77 W. Wacker Drive - Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

CHI 67359832v1

-----  
Certificate of Electronic Transmission: The undersigned hereby certifies that this document and its attachments are being transmitted electronically via EFS-Web to the United States Patent and Trademark Office on this 29<sup>th</sup> day of August, 2016.

By: /Cynthia Tapia/  
Name: Cynthia Tapia





# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2

**CONFIRMATION NO. 8522**

34018  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

## PUBLICATION NOTICE



OC000000089418578

**Title:**GARDENING TOOL

**Publication No.**US-2017-0049048-A1

**Publication Date:**02/23/2017

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at [www.uspto.gov](http://www.uspto.gov) using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



## 证 明

本证明之附件是向本局提交的下列专利申请文件副本。

申 请 号：201310468919.9

申 请 类 型：发明专利

发 明 创 造 名 称：割草机及其控制电路

申 请 日：2013 年 10 月 10 日

申 请 人：南京德朔实业有限公司

发明人或设计人：山冈敏成、聂方杰、许海深

局长  
申长雨

2014 年 11 月 01 日



## 权 利 要 求 书

1. 一种割草机，包括本体和操作把手，其特征在于，所述操作把手通过一枢轴枢转地连接至本体，且所述枢轴随着操作把手的转动而转动，所述本体上设置有第一触发开关，所述第一触发开关与割草机的主机开关串联在割草机的控制电路中，所述枢轴上具有一触发件，当所述操作把手转动至工作位置时，所述触发件使第一触发开关触发，而当操作把手转动至非工作位置时，所述触发件不会使第一触发开关触发。
2. 根据权利要求 1 所述的割草机，其特征在于，其中还包括一具有多个挡位的换挡件，该换挡件设置在操作把手与本体的连接处，上述操作把手上设有与上述换挡件的多个挡位自动卡接以实现固定或调整上述操作把手的锁定机构。
3. 根据权利要求 2 所述的割草机，其特征在于，其中所述锁定机构包括：用于调节档位的换挡组件、用于控制上述换挡组件的操作组件；上述操作把手包括：两个连杆以及所述枢轴，上述两个连杆的另一端部位于上述把手枢轴的同侧；上述换挡组件包括：与上述换挡件的挡位配合的自动伸缩销、套装在上述自动伸缩销外围并与之构成滑动连接的销套、用于将上述自动伸缩销向上述换挡件的方向自上述销套弹出的弹性件；上述操作组件包括：用于控制上述自动伸缩销的操作件、用于将上述操作件安装在上述连杆上的固定件；上述销套与上述其中一个连杆固定连接，上述自动伸缩销远离上述换挡件的一端穿过上述销套与上述操作件相连接。
4. 根据权利要求 3 所述的割草机，其特征在于，上述操作组件还包括使上述操作件在无外力时自动复位的复位件。
5. 根据权利要求 1 所述的割草机，其特征在于，其中所述的操作把手为可伸缩的。
6. 根据权利要求 5 所述的割草机，其特征在于，其中所述的操作把手包括滑动连接的内管和外管，所述外管的上端外侧设置有一第二触发开关，所述第二触发开关与第一触发开关机器以及割草机的主机开关串联在割草机的控制电路中，且所述的外管对应第二触发开关的位置还有一个开口，第二触发开关的触发部与所述开口位置对齐，所述内管的下端部具有一操作件，当所述的内管被拉至外管的所述开口位置时，所述的操作件触发所述第二触发开关，否则所述第二触发开关都是处于非触发状态。
7. 一种割草机的控制电路，其特征在于，包括串联连接的电源、工作马达、主机开关和第一触发开关，所述主机开关和第一触发开关共同控制电源是否供电给工作马达，其中所述第一触发开关设置于所述操作把手旋转处，所述操作把手通过一枢轴可枢转的连接至本体，且所述枢轴随着操作把手的转动而转动，所述枢轴上设置一触发件，用于触发所述第一触发开关。



## 权 利 要 求 书

---

8. 根据权利要求 7 所述的割草机的控制电路，其特征在于，其中还包括第二触发开关，所述第二触发开关与电源、工作马达、主机开关和第一触发开关为串联连接，所述割草机的操作把手为可伸缩的，所述的第二触发开关设置在所述操作把手的伸缩处。



## 说明书

# 割草机及其控制电路

### 技术领域

**[0001]** 本发明涉及园林工具领域，且特别是有关于一种割草机及其控制电路。

### 背景技术

**[0002]** 割草机是一种用于平整草坪的工具，其主要通过主机体的马达带动刀片实现对过长的草叶的剪切，为了实现高效率的割草，割草机的马达功率比较大，因此其对操作者的人身安全也有一定隐患，现在一般通过较长的把手使操作者尽可能远离主机体，避免发生危险，但是为了能够方便收纳割草机，把手杆往往是可折叠的，这就有可能当把手处于折叠状态时，使用者误触开关，从而启动割草机，此时操作者非常靠近主机体，很容易发生危险。

### 发明内容

**[0003]** 本发明的目的在于提供一种在把手处于非工作位置时能够禁止机器启动的割草机及其控制电路，以提高对使用者人身安全的保护。

**[0004]** 为达上述目的，本发明首先提出一种割草机，包括本体和操作把手，所述操作把手通过一枢轴可枢转的连接至本体，且所述枢轴随着操作把手的转动而转动，其中所述本体上设置有第一触发开关，所述第一触发开关与割草机的主机开关串联在割草机的控制电路中，所述枢轴上具有一触发件，当所述操作把手转动至工作位置时，所述触发件使第一触发开关触发，而当操作把手转动至非工作位置时，所述触发件不会使第一触发开关触发。

**[0005]** 进一步，所述割草机还包括一具有多个挡位的换挡件，所述换挡件设置在操作把手与本体的连接处，上述操作把手上设有与上述换挡件的多个挡位自动卡接以实现固定或调整上述操作把手的锁定机构。其中所述锁定机构包括：用于调节档位的换挡组件、用于控制上述换挡组件的操作组件；上述操作把手包括：两个连杆以及所述枢轴，上述两个连杆的另一端部位于上述把手枢轴的同侧；上述换挡组件包括：与上述换挡件的档位配合的自动伸缩销、套装在上述自动伸缩销外围并与之构成滑动连接的销套、用于将上述自动伸缩销向上述换挡件的方向自上述销套弹出的弹性件；上述操作组件包括：用于控制上述自动伸缩销的操作件、用于将上述操作件安装在上述连杆上的固定件；上述销套与上述其中一个连杆固定连接，上述自动伸缩销远离上述换挡件的一端穿过上述销套与上述操作件相连接。

**[0006]** 进一步，其中上述操作组件还包括使上述操作件在无外力时自动复位的复位件。

**[0007]** 进一步，其中所述的操作把手为可伸缩的。其中所述的操作把手包括滑动连接的内管和外管，所述外管的上端外侧设置有一第二触发开关，所述第二触发开关与第一触发开关



## 说明书

机器以及割草机的主机开关串联在割草机的控制电路中，且所述的外管对应第二触发开关的位置还有一个开口，所述内管的下端部具有一操作件，当所述的内管被拉至外管的所述开口位置时，所述的操作件通过所述开口触发第二触发开关，否则所述第二触发开关都是处于非触发状态。

**[0008]** 为达上述目的，本发明另提出一种割草机的控制电路，包括串联连接的电源、工作马达、主机开关和第一触发开关，所述主机开关和第一触发开关共同控制电源是否供电给工作马达。其中所述第一触发开关设置于所述操作把手旋转处，所述操作把手通过一枢轴可枢转的连接至本体，且所述枢轴随着操作把手的转动而转动，所述枢轴上设置一触发件，用于触发所述第一触发开关。

**[0009]** 进一步，所述控制电路还包括第二触发开关，所述第二触发开关与电源、工作马达、主机开关和第一触发开关为串联连接，所述割草机的操作把手为可伸缩的，所述的第二触发开关设置在所述操作把手的伸缩处。

**[0010]** 本发明的有益效果在于：首先本发明在操作把手的转轴处设置一触发开关，当操作把手处于非工作位置时，所述触发开关不能被触发，这样的话，即使操作者误操作主机开关也不会开启机器。而且在所述的操作把手的伸缩处也设置有一触发开关，这样使得操作把手在未被拉伸至操作位置时误触主机开关都不会开启机器，提高了对使用者人身安全的保护，实现了双重安全保护。

**[0011]**

附图说明

**[0012]** 图1为本发明第一实施例中割草机的结构示意图。

**[0013]** 图2为图1中的割草机操作的局部分解示意图。

**[0014]** 图3为本发明第一实施例的割草机的控制电路示意图。

**[0015]** 图4为图1中操作把手枢轴处触发开关未触发时的示意图。

**[0016]** 图5为图1中操作把手枢轴处触发开关被触发时的示意图。

**[0017]** 图6为图1中割草机的换挡件及锁定结构处的分解示意图。

**[0018]** 图7为图6中换挡件的分解示意图。

**[0019]** 图8为本发明第二实施例的割草机的控制电路的示意图。

**[0020]** 图9为本发明第二实施例中割草机把手伸缩处的触发开关未被触发时的示意图。

**[0021]** 图10为本发明第二实施例中割草机把手伸缩处的触发开关未被触发时的示意图。

**[0022]**

具体实施方式

-



## 说明书

[0023] 以下结合附图和具体实施例对本发明作具体的介绍。

[0024] 如图 1 和图 2 所示，割草机 100 包括本体 10 和操作把手 20，且所述割草机 100 还具有一主机开关 SW，设置于所述操作把手 20 的上端，使用者通过操作扳机 B，即可触发主机开关 SW。

[0025] 本实施例中，如图 2 所示，操作把手 20 通过一枢轴 21 可枢转的连接至本体 10，且所述枢轴 21 随着操作把手 20 的转动而转动，进一步所述的操作把手 20 为可伸缩的，且操作把手 20 包括互相为滑动连接的内管 20a 和外管 20b。其中割草机 100 的本体 10 上设置有触发开关 SW1，触发开关 SW1 与割草机 100 的主机开关 SW 串联在割草机的控制电路中，如图 3 所示。枢轴 21 上具有触发件 22。

[0026] 当操作把手 20 转动至工作位置时，触发件 22 使触发开关 SW1 触发，如图 4 所示，这样当使用者需要开启割草机时，使用者操作扳机 B 触发主机开关 SW 即可。

[0027] 而当操作把手 20 转动至非工作位置时，此时枢轴 21 随着操作把手 20 一起转动，此时枢轴 21 上的触发件 22 也向下运动，远离触发开关 SW1，触发开关被释放，如图 5，导致割草机的控制电路断开，此时即使使用者在操作的过程中误触主机开关 SW，割草机也无法被启动，避免了割草机对使用者造成伤害，提高了割草机的安全性。

[0028] 进一步，本实施例中，如图 1、图 6-7 所示，割草机 100 还包括具有多个挡位的换挡件 23，设置在操作把手 20 与本体 10 的连接处。操作把手 20 上设有与换挡件 23 的多个挡位自动卡接以实现固定或调整操作把手 20 的锁定机构 24。

[0029] 换挡件 23 是用于设置档位并与锁定机构配合以锁定档位的，作为一种优选方案，该换挡件 23 是外形为板结构的换挡锁定板 231，当然，换挡件也可以采用其他形式的，比如块状的。另外，换挡锁定板 231 的下部还设有一个安装缺口 233，使得枢轴 21 在转动换挡时不会受到阻碍。需要说明的是，档位优选形成于换挡锁定板 231 上的多个限位孔 235a-235c 或圆弧形的限位缺口 234，且限位孔 235a-235c 位于限位缺口 234 的两侧。

[0030] 为了更好地灵活调整和固定档位，锁定机构 24 包括：用于调节档位的换挡组件和用于控制上述换挡组件的操作组件。

[0031] 其中，换挡组件包括：自动伸缩销 241、销套 242 和弹性件 243。其中，自动伸缩销 241 可以与限位孔 235a-235c 和限位缺口 234 配合实现档位锁定，销套 242 与外管 20b 固定连接并套在自动伸缩销 241 的外围，与自动伸缩销 241 构成滑动连接，弹性件 243 可以将自动伸缩销 241 向换挡锁定板 231 的档位处自动弹出，实现在无外力作用下自动锁定档位。

[0032] 作为一种优选方案，在销套 242 的与外管 20b 固定连接的一端设有外螺纹；外管 20b



## 说明书

则在两者连接的位置形成一个通孔 247，并且在通孔 247 内加工形成与销套 242 的外螺纹相配合的内螺纹，从而将销套 242 与外管 20b 固定连接在一起。当然，也可以采用其他方法：比如，销套 242 设有外螺纹的部分穿过外管 20b 后与螺母 246 固定连接在一起，也可以实现将销套 242 与外管 20b 固定连接在一起。

**[0033]** 为了使自动伸缩销 241 能够更好地自动与档位配合，在自动伸缩销 241 上形成了销限位结构，在销套 242 上则形成了套限位结构，弹性件 243 处于销限位结构与套限位结构之间。优选该弹性件 243 为螺旋弹簧，且销限位结构为在自动伸缩销 241 外围形成的环形台阶，套限位结构为在销套 242 内部形成的环形台阶，这样一来，螺旋弹簧的一端抵住销限位结构，另一端抵住套限位结构，使自动伸缩销 241 具有向换挡件的档位运动的趋势，从而实现自动锁定档位。

**[0034]** 进行换挡操作时，必须要使自动伸缩销 241 退出档位并且移动，这就需要带动自动伸缩销 241 运动的操作组件。

**[0035]** 操作组件包括：操作件 244 和固定件 245。其中，操作件 244 是操作者实现档位调整的执行部件，且在其用于手握的一端设有防滑把手，以便操作者更可靠地控制操作件 244。自动伸缩销 241 穿过销套 242 和外管 20b，与操作件 244 的另一端构成转动连接。优选自动伸缩销 241 与操作件 244 构成连接的部位形成轴孔，在轴孔中插入轴（图未示）使两者构成可转动的连接。

**[0036]** 固定件 7 固定连接在设有通孔 247 的外管 20b 上，操作件 244 则与该固定件 245 转动连接在一起。为了使操作件 244 与固定件 245 能够构成转动连接，作为一种优选方案，在固定件 245 和操作件 244 上均形成了连接轴孔 240，安装时在连接轴孔 240 内插入转轴（图未示）即可，这样构成的转动连接不但牢固可靠而且结构简单、便于安装。这样的话，操作件 244 就构成了一个以与固定件 245 构成连接的位置处作为支点的杠杆，当外力驱使操作件的防滑把手向外管 20 靠近时，就可以使得自动伸缩销 241 在操作件 244 的作用下远离换挡件并退出档位，从而为档位调整做好准备。

**[0037]** 为了进一步提高使用的便捷性，操作组件还包括一个使操作件 244 在无外力作用的状态下能够自动复位的复位件 248。优选的复位件 248 采用套接在转轴外围的扭力弹簧，该扭力弹簧的一端抵住操作件 244，另一端抵住固定件 7 或者与固定件 245 固定连接的外管 20b。因而，在没有外力的作用下，扭力弹簧的弹性能量将驱使操作件 244 实现自动复位。当然，此处的复位件 248 也可以基于磁性能量进行设计，这是很容易想到的变换，不作赘述。





## 说明书

[0038] 通过上述，我们已经介绍了一种能够便捷、可靠地实现自动换挡的多档位把手机构，仅以在安装了销套 242 的外管 20b 的外侧安装了保护罩 249，从而确保对多档位把手机构和割草机的保护，并使其外形更加美观紧凑。

[0039] 为了使换挡锁定板 231 与割草机主体的固定更加牢固，换挡锁定板 231 弯折并向平行于枢轴 21 的方向延伸形成止动结构 232，割草机主体则设有与止动结构 232 配合的安装结构（图未示），安装结构可以但不限于是与割草机主体一体形成的可以容纳止动结构 232 的凹槽，这样一来，换挡锁定板 231 通过螺丝固定在割草机主体上，并且止动结构 232 与安装结构的配合能够有效防止两者发生位置错动，保证两者的安装和限位十分可靠。

[0040] 作为一种优选方案，档位包括限位孔 235a-235c 和限位缺口 234，其中，限位孔的数量为 3 个，其中两个相邻设置，位于限位缺口 234 的同一侧，作为正常割草使用时调节操作把手高度的第一高度档位 235a 和第二高度档位 235b，从而满足不同身高的人群需求；另外一个限位孔 235c 设置在限位缺口 234 的另一侧，作为用于收纳割草机时折叠把手的收纳档位；限位缺口 234 为一端圆弧形的、可供自动伸缩销 241 运动、用于倒草操作时的活动档位。这样，割草机具有两个工作位置，以及 1 个倒草位置（非工作位置），当操作把手处于高第一高度档位 235a 和第二高度档位 235b 时，触发开关 SW1 均处于触发状态。

[0041] 由上可知，在上述第一实施例中，割草机 100 在操作把手 20 的枢转处设置了一安全开关，枢转处的触发开关 SW1 触发了，使用者就可以通过主机开关 SW 来操控割草机的启动或关闭。

[0042] 然而，本其他实施例中，其余的结构与第一实施例中类似，区别仅在于所外管 20b 的上端外侧还设置有触发开关 SW2，所述触发开关 SW2 与触发开关 SW1 以及割草机的主机开关 SW 串联在割草机的控制电路中，如图 8 所示。本实施例中，割草机的控制电路包括串联连接的电源、工作马达、主机开关 SW、触发开关 SW1 和触发开关 SW2，所述主机开关 SW、触发开关 SW1 和触发开关 SW2 共同控制电源是否供电给工作马达。

[0043] 外管 20b 对应触发开关 SW2 的位置还有一个开口 P，所述内管 20a 的下端部具有一操作件 20a'，当内管 20a 被拉至外管 20b 的开口 P 位置时，即操作把手 20 处于拉伸至工作位置的状态，操作件 20a' 触发触发开关 SW2，如图 9 所示，这样当触发开关 SW1 也是处于触发状态时，使用者仅需控制主机开关 SW，就能控制割草机是启动还是关闭，否则操作件 20a'。否则，当操作把手 20 被收缩回外管 20b 内时，操作件 20a' 向着远离触发开关 SW2 的方向移动，无法触发触发开关 SW2，这种情况下，即使触发开关 SW1 也是处于触发状态时，使用者操作扳机 B 触发主机开关 SW 也无法启动割草机。这样，当割草机的操作



## 说明书

---

把手 100 处于工作位置但是却处于收缩状态时，使用者误触扳机 B，启动割草机，避免了对使用者的人身安全带来危险。

**[0044]** 综上所述，本发明在操作把手的转轴处设置一触发开关，当操作把手处于非工作位置时，所述触发开关不能被触发，这样的话，即使操作者误操作主机开关也不会开启机器。而且在所述的操作把手的伸缩处也设置有一触发开关，这样使得操作把手在未被拉伸至操作位置时误触主机开关都不会开启机器，提高了对使用者人身安全的保护，实现了双重安全保护。

**[0045]** 以上显示和描述了本发明的基本原理、主要特征和优点。本行业的技术人员应该了解，上述实施例不以任何形式限制本发明，凡采用等同替换或等效变换的方式所获得的技术方案，均落在本发明的保护范围内。



## 说明书附图

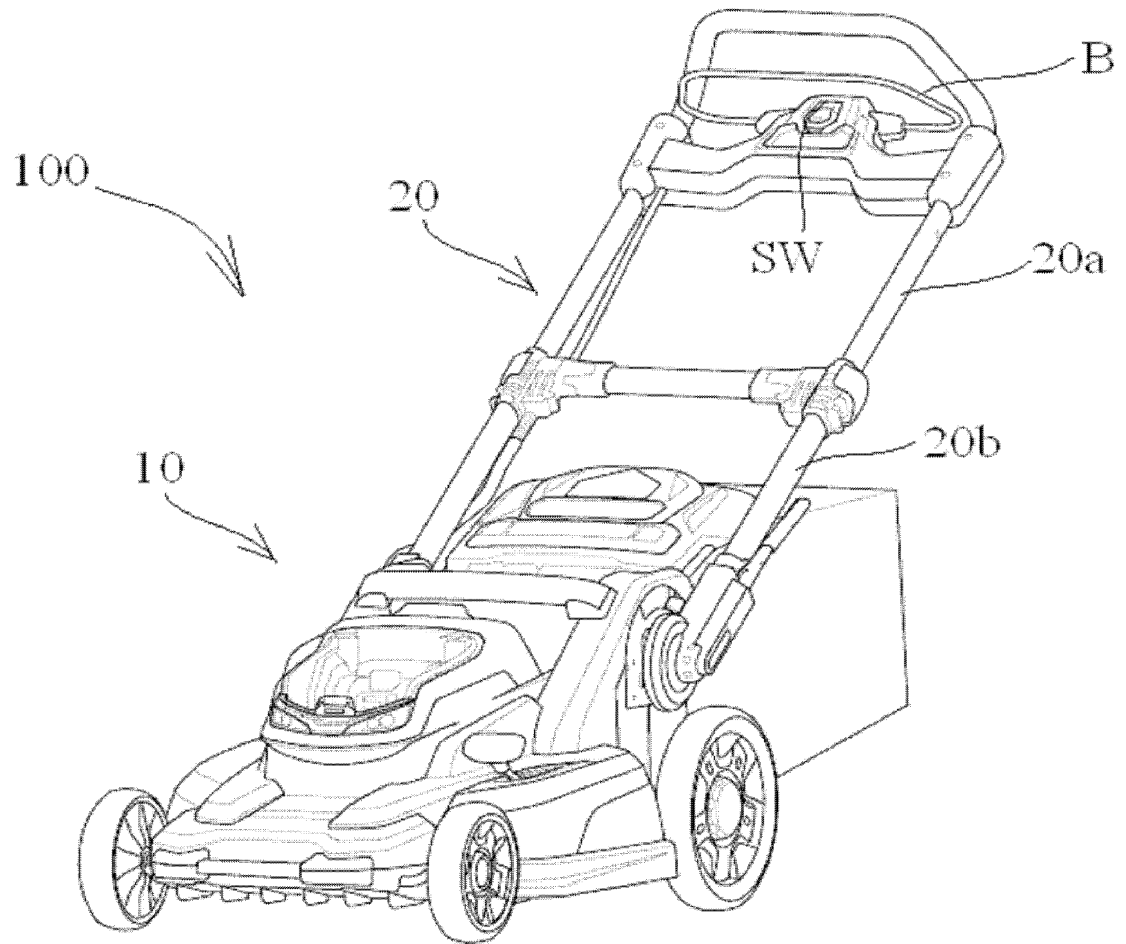


图 1



## 说明书附图

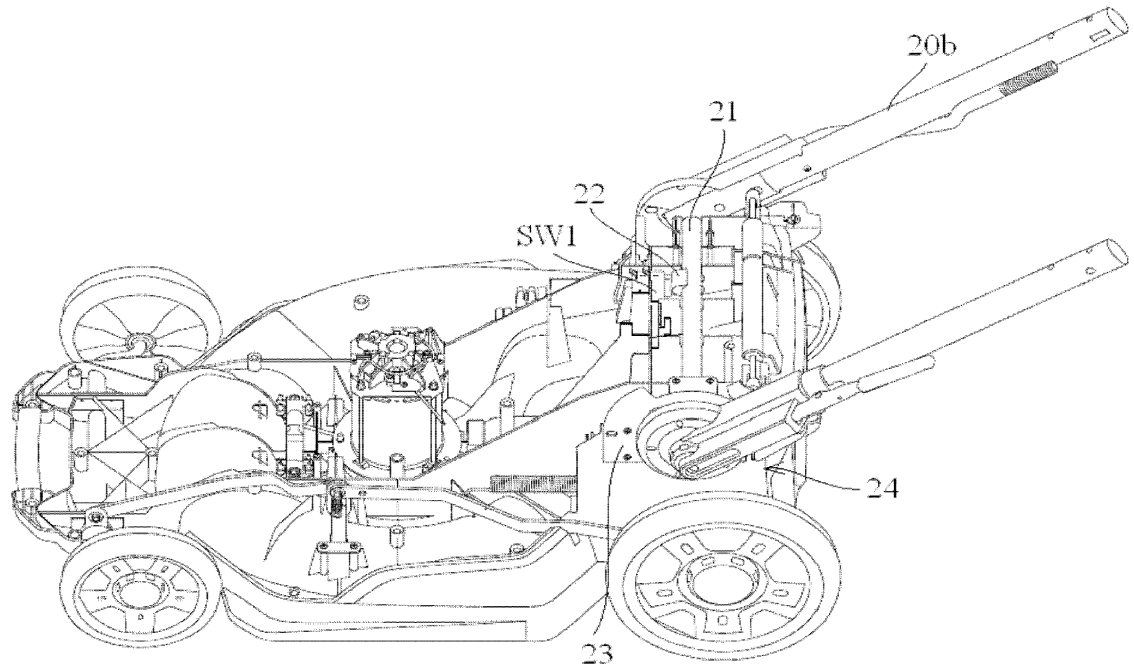


图 2

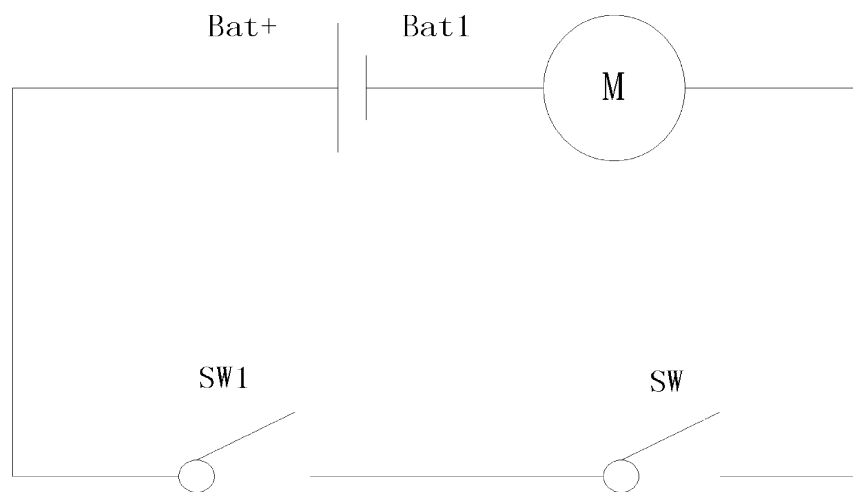


图 3



## 说明书附图

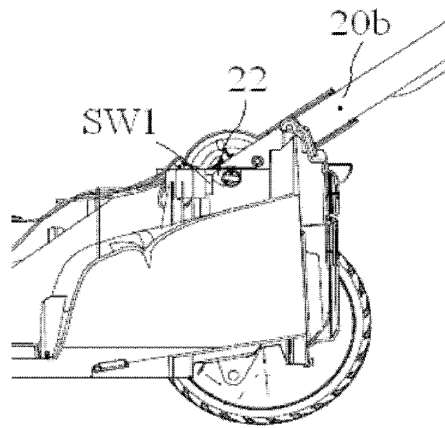


图 4

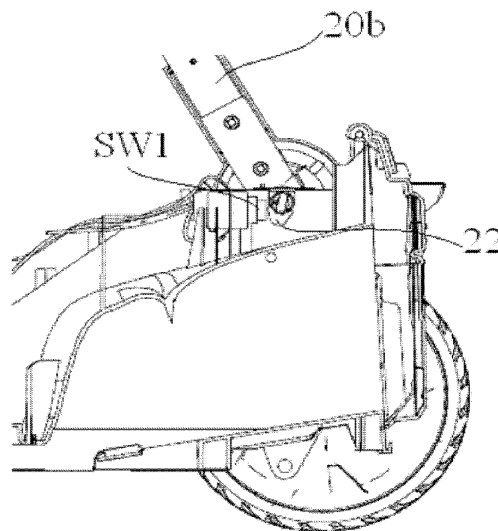


图 5



## 说明书附图

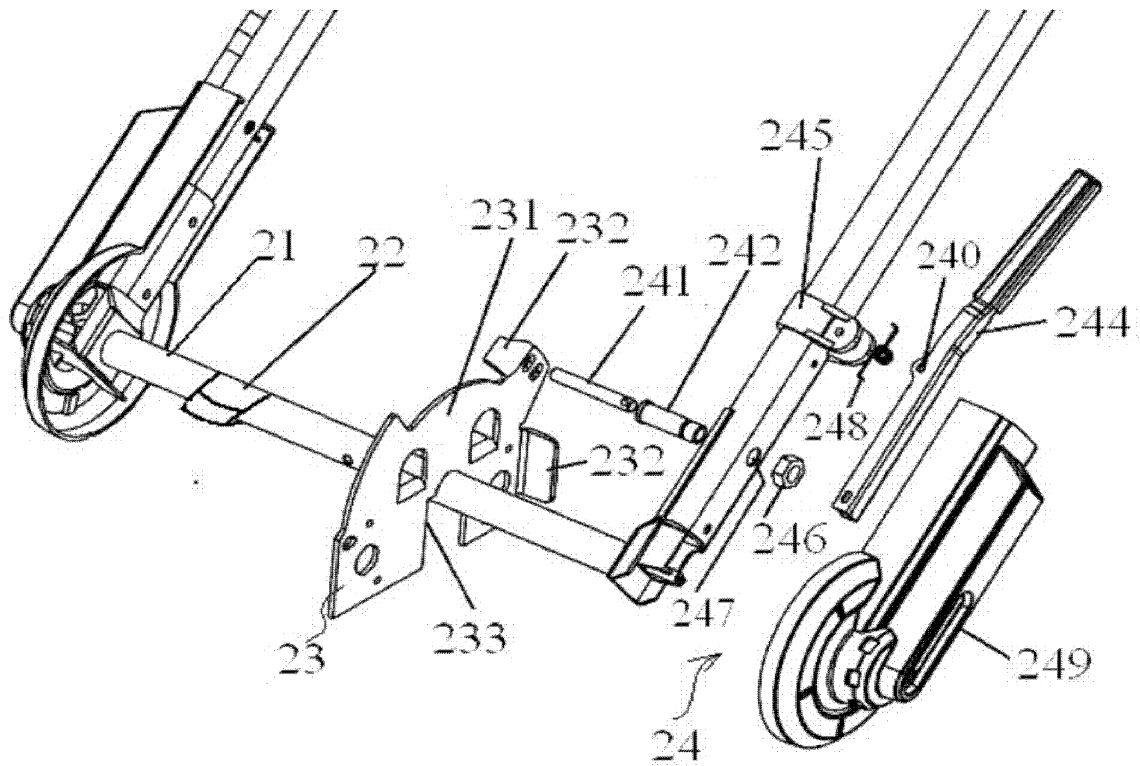


图 6



## 说明书附图

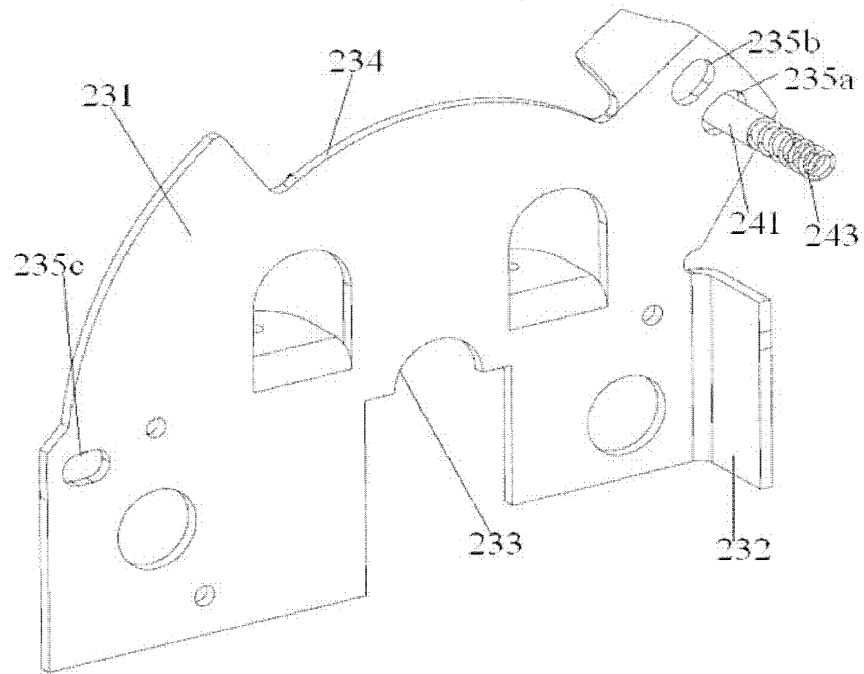


图 7

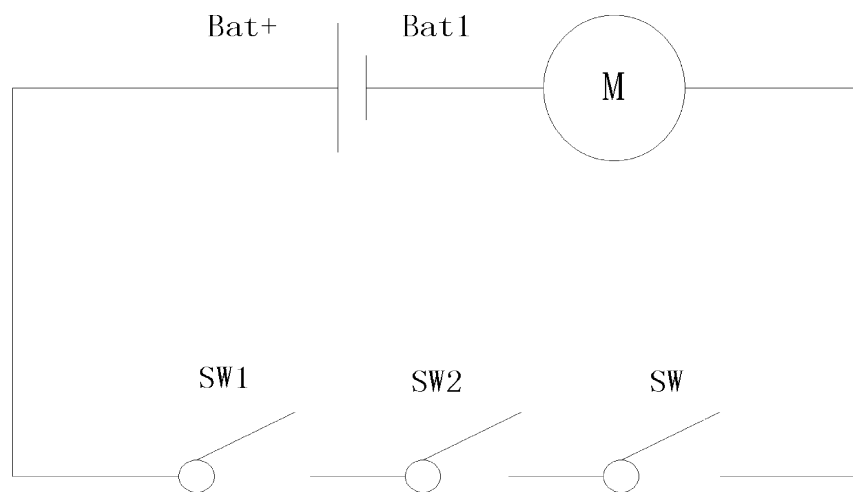


图 8



## 说明书附图

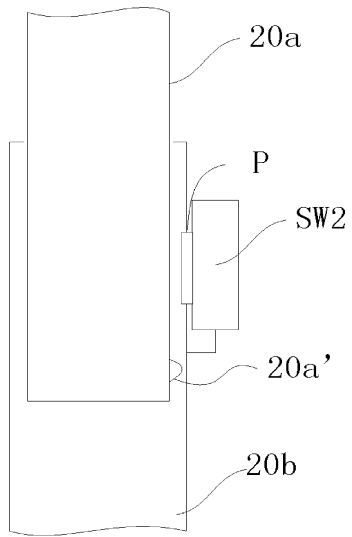


图 9

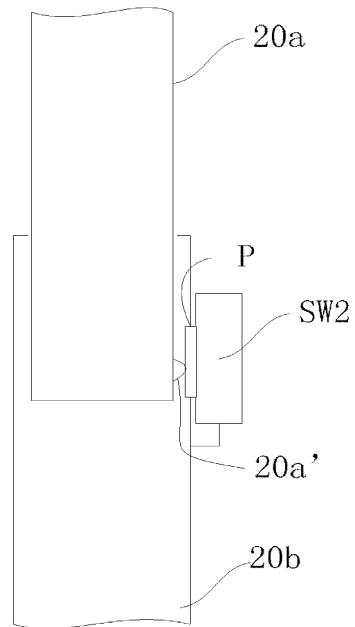


图 10





## 证 明

本证明之附件是向本局提交的下列专利申请文件副本。

申 请 号：201410167041.X

申 请 类 型：发明专利

发 明 创 造 名 称：园林工具

申 请 日：2014 年 04 月 23 日

申 请 人：南京德朔实业有限公司

发明人或设计人：山冈敏成、聂方杰、许海深

局长  
申长雨

2014 年 10 月 31 日



## 权 利 要 求 书

1. 一种园林工具，包括：主机以及与之转动连接的把手，所述主机包括：功能附件以及能驱动该功能附件工作的原动机；其特征在于：所述园林工具还包括：能综合根据所述把手的转动位置和所述把手即时的操作状态控制所述原动机或/和所述功能附件的控制系统。
2. 根据权利要求 1 所述的园林工具，其特征在于，所述园林工具为电动工具，所述原动机为电机。
3. 根据权利要求 2 所述的园林工具，其特征在于，所述控制系统包括：至少具有两个控制装置且在其中一个控制装置处于指定状态时其余控制装置才能实现控制的电路系统。
4. 根据权利要求 3 所述的园林工具，其特征在于，所述电路系统包括：电源，使所述电源能为所述电机供电的供电电路、作用于所述供电电路且仅在其处于指定状态时所述电源才能为所述电机供电的角度预险装置、能被操作进而控制所述电机电流通断的操作装置。
5. 根据权利要求 4 所述的园林工具，其特征在于，所述角度预险装置包括：直接控制所述供电电路的角度预险开关或/和通过信号指令间接控制供电电路的角度预险信号发生器。
6. 根据权利要求 5 所述的园林工具，其特征在于，所述角度预险开关和角度预险信号发生器均为通过接触触发的触点开关和通过感应触发的位置开关中的一种。
7. 根据权利要求 6 所述的园林工具，其特征在于，所述触点开关设置在靠近所述把手与主机构成转动连接的转轴处，其触点仅在所述把手旋转至指定位置时被所述把手或主机接触触发；所述位置开关设置在靠近所述把手与主机构成转动连接的转轴处，其仅在所述把手旋转至指定位置时被所述把手或主机的位置变化造成的信号反馈所触发。
8. 根据权利要求 3 至 7 任意一项所述的园林工具，其特征在于，所述控制系统还包括：在所述电机断电时通过物理接触对所述功能附件进行制动的制动系统，所述制动系统至少受到所述电路系统控制。
9. 根据权利要求 2 所述的园林工具，其特征在于，所述把手为具有多个伸缩关节的伸缩把手，所述控制系统至少具有三个控制装置且在其中两个控制装置分别处于指定状态时其余控制装置才能实现控制的电路系统。
10. 根据权利要求 9 所述的园林工具，其特征在于，所述电路系统包括：电源，使所述电源能为所述电机供电的供电电路，作用于所述供电电路且仅在处于指定状态时所述电源才能为所述电机供电的角度预险装置，作用于所述供电电路且仅在其与所述角度预险装置均处于各自的指定状态时所述电源才能为所述电机供电的距离预险装置、能被操作进而控制所述电机电流通断的操作装置。
11. 根据权利要求 10 所述的园林工具，其特征在于，所述距离预险装置包括：直接控制所



## 权 利 要 求 书

---

述供电电路的距离预险开关或/和通过信号指令间接控制供电电路的距离预险信号发生器。

**12.** 根据权利要求 11 所述的园林工具，其特征在于，所述距离预险开关和把手信号发生器均为通过接触触发的触点开关和通过感应触发的位置开关中的一种。

**13.** 根据权利要求 12 所述的园林工具，其特征在于，所述触点开关设置于所述伸缩关节的连接处，其触点仅在两个相连接的伸缩关键相对拉开至指定位置时被接触触发；所述位置开关设置于所述伸缩关节的连接处，其仅在两个相连接的伸缩关键相对拉开至指定位置时被所述伸缩关键位置变化造成的信号反馈所触发。

**14.** 根据权利要求 9 至 13 任意一项所述的园林工具，其特征在于，所述控制系统还包括：在所述电机断电时通过物理接触对所述功能附件进行制动的制动系统，所述制动系统至少受到所述电路系统控制。

## 说明书

# 园林工具

### 技术领域

**[0001]** 本发明涉及一种园林工具，具体涉及一种具有把手且能根据把手的操作状态进行预险控制的园林工具。

### 背景技术

**[0002]** 割草机等花园工具主要通过主机的原动机（比如：电机）带动功能附件（比如刀片）实现对工具功能，一般而言此类工具功率较高、功能附件的运动也具有高速、高频的特点，因此其对操作者的人身安全也有一定隐患，现在一般通过较长的把手使操作者尽可能远离主机，避免发生危险，但是为了能够方便收纳割草机，把手是可通过折叠、旋转等方式进行收纳的，这就有可能在把手处于收纳状态、用户过于靠近主机时，用户误触开关，从而启动割草机，此时操作者非常靠近主机，很容易发生危险。

### 发明内容

**[0003]** 为解决现有技术的不足，本发明的目的在于提供一种能综合根据把手的转动位置和把手即时的操作状态控制原动机、功能附件的园林工具。

**[0004]** 为了实现上述目标，本发明采用如下的技术方案：

一种园林工具，包括：主机以及与之转动连接的把手，主机包括：功能附件以及能驱动该功能附件工作的原动机；该园林工具还包括：能综合根据把手的转动位置和把手即时的操作状态控制原动机或/和功能附件的控制系统。

**[0005]** 进一步地，园林工具为电动工具，原动机为电机。

**[0006]** 进一步地，控制系统包括：至少具有两个控制装置且在其中一个控制装置处于指定状态时其余控制装置才能实现控制的电路系统。

**[0007]** 进一步地，电路系统包括：电源，使电源能为电机供电的供电电路、作用于供电电路且仅在其处于指定状态时电源才能为电机供电的角度预险装置、能被操作进而控制电机电流通断的操作装置。

**[0008]** 进一步地，角度预险装置包括：直接控制供电电路的角度预险开关或/和通过信号指令间接控制供电电路的角度预险信号发生器。

**[0009]** 进一步地，角度预险开关和角度预险信号发生器均为通过接触触发的触点开关和通过感应触发的位置开关中的一种。

**[0010]** 进一步地，触点开关设置在靠近把手与主机构成转动连接的转轴处，其触点仅在把

## 说明书

手旋转至指定位置时被把手或主机接触触发；位置开关设置在靠近把手与主机构成转动连接的转轴处，其仅在把手旋转至指定位置时被把手或主机的位置变化造成的信号反馈所触发。

**[0011]** 进一步地，当把手为具有多个伸缩关节的伸缩把手时，控制系统至少具有三个控制装置且在其中两个控制装置分别处于指定状态时其余控制装置才能实现控制的电路系统。

**[0012]** 进一步地，电路系统包括：电源，使电源能为电机供电的供电电路，作用于供电电路且仅在处于指定状态时电源才能为电机供电的角度预险装置，作用于供电电路且仅在其与角度预险装置均处于各自的指定状态时电源才能为电机供电的距离预险装置、能被操作进而控制电机电流通断的操作装置。

**[0013]** 进一步地，距离预险装置包括：直接控制供电电路的距离预险开关或/和通过信号指令间接控制供电电路的距离预险信号发生器。

**[0014]** 进一步地，距离预险开关和把手信号发生器均为通过接触触发的触点开关和通过感应触发的位置开关中的一种。

**[0015]** 进一步地，触点开关设置于伸缩关节的连接处，其触点仅在两个相连接的伸缩关键相对拉开至指定位置时被接触触发；位置开关设置于伸缩关节的连接处，其仅在两个相连接的伸缩关键相对拉开至指定位置时被伸缩关键位置变化造成的信号反馈所触发。

**[0016]** 进一步地，控制系统还包括：在电机断电时通过物理接触对功能附件进行制动的制动系统，制动系统至少受到电路系统控制。

**[0017]** 本发明的有益之处在于：综合根据把手的转动位置和把手即时的操作状态控制原动机、功能附件，在把手处于非正常使用状态下，即使把手上正常用于启动工具运行的操作装置被误操作，原动机和功能附件也因未被驱动而保证用户的安全，预防危险的发生。

### 附图说明

**[0018]** 图 1 是本发明园林工具的一个优选实施例结构示意图；

图 2 是图 1 所示实施例的部分结构示意图；

图 3 是图 1 所示实施例中把手及其角度档位机构的爆炸结构示意图；

图 4 是图 5 中换挡件的结构示意图；

图 5 是图 1 所示实施例中把手的两个伸缩关节连接处的结构示意图；

图 6 是图 5 所示两个伸缩关节在另一相对位置状态下的结构示意图；

图 7 是图 1 所示实施例中角度预险装置在一状态下的结构示意图；

图 8 是图 7 所示部分在另一状态下的结构示意图；

图 9 是本发明中角度预险装置另一个优选实施例的结构示意图；

## 说明书

图 10 是图 9 所示部分在另一状态下的结构示意图。

### 具体实施方式

**[0019]** 以下结合附图和具体实施例对本发明作具体的介绍。

**[0020]** 参照图 1 至图 10 所示，本发明的园林工具作为一种优选方案为一电动割草机 100。

**[0021]** 该割草机 100 包括：主机 10、把手 20 和控制系统（图未标识）。把手 20 转动连接至主机 10，用户可以通过转动把手 20 调节操作姿态或减少割草机 100 所占的空间实现收纳。

**[0022]** 主机 10 包括原动机和功能附件（两者均未示出），功能附件用于实现工具的功能，对割草机 100 而言，功能附件为割草刀片，原动机的作用在于驱动功能附件以一定的方式运动使其完成工具功能，对于割草机 100 而言，原动机驱动功能附件高速转动。在该实施例中原动机为电机，以下也以原动机为电机作为基础进行说明。

**[0023]** 把手 20 为了使用户具有较为舒适和可靠的操作感受，把手 20 优选包括两个把手杆（图未标识），它们靠近主机 10 的一端分别连接至转轴 21 处以实现与主机 10 的转动连接，它们远离主机 10 的一端之间设置操作部（图未标识），在该操作部处设置有操作装置（图未标识），对于割草机 100 而言，操作装置包括：一主机开关 SW1，在用户主观上希望驱动原动机使主机 10 工作时，用户可以通过操作主机开关 SW1 实现。作为一种优选方案，主机开关 SW1 可以串联在割草机 100 电源为电机供电的线路中，通过自身的通断进行控制。

**[0024]** 需要说明的一点是，该主机开关 SW1 并非是控制电机以及功能附件的唯一装置，其仅是用于实现用户的操作需求。

**[0025]** 另外，作为具体实施方案，操作部设置一扳机 B，用户可以通过操作扳机 B 实现对主机开关 SW1 的控制。作为一种优选方案，

为了使用户通过调整处于一个相对合适的距离去操作主机，对于一个把手杆而言，其包括两个伸缩关节 20a、20b，更具体的而言，其中一个伸缩关节 20a 形成套管结构，另一伸缩关节 20a 插入在伸缩关节 20b 中使它们构成滑动连接，从而使伸缩关节 20a 能实现伸缩。

**[0026]** 另外，参照图 2、3、5 所示，为了实现把手 20 转动时的角度档位调节，作为一种优选方案，角度档位机构（图中未标识）包括：换挡件 23 锁定机构 24，其设置在使把手 20 与主机 10 构成连接的转轴 21 处。把手 20 上设有与换挡件 23 的多个挡位自动卡接以实现固定或调整把手 20 的锁定机构 24。

**[0027]** 换挡件 23 是用于设置档位并与锁定机构配合以锁定档位的，作为一种优选方案，该换挡件 23 是外形为板结构的换挡锁定板 231，当然，换挡件也可以采用其他形式的，比如块状的。另外，换挡锁定板 231 的下部还设有一个安装缺口 233，使得转轴 21 在转动换挡

## 说明书

时不会受到阻碍。需要说明的是，档位优选形成于换挡锁定板 231 上的多个限位孔 235a、235b、235c 或圆弧形的限位缺口 234，且限位孔 235a、235b、235c 位于限位缺口 234 的两侧。

**[0028]** 为了更好地灵活调整和固定档位，锁定机构 24 包括：用于调节档位的换挡组件和用于控制上述换挡组件的操作组件。

**[0029]** 其中，换挡组件包括：自动伸缩销 241、销套 242 和弹性件 243。其中，自动伸缩销 241 可以与限位孔 235a、235b、235c 和限位缺口 234 配合实现档位锁定，销套 242 与外管 20b 固定连接并套在自动伸缩销 241 的外围，与自动伸缩销 241 构成滑动连接，弹性件 243 可以将自动伸缩销 241 向换挡锁定板 231 的档位处自动弹出，实现在无外力作用下自动锁定档位。

**[0030]** 作为一种优选方案，在销套 242 的与外管 20b 固定连接的一端设有外螺纹；外管 20b 则在两者连接的位置形成一个通孔 247，并且在通孔 247 内加工形成与销套 242 的外螺纹相配合的内螺纹，从而将销套 242 与外管 20b 固定连接在一起。当然，也可以采用其他方法：比如，销套 242 设有外螺纹的部分穿过外管 20b 后与螺母 246 固定连接在一起，也可以实现将销套 242 与外管 20b 固定连接在一起。

**[0031]** 为了使自动伸缩销 241 能够更好地自动与档位配合，在自动伸缩销 241 上形成了销限位结构，在销套 242 上则形成了套限位结构，弹性件 243 处于销限位结构与套限位结构之间。优选该弹性件 243 为螺旋弹簧，且销限位结构为在自动伸缩销 241 外围形成的环形台阶，套限位结构为在销套 242 内部形成的环形台阶，这样一来，螺旋弹簧的一端抵住销限位结构，另一端抵住套限位结构，使自动伸缩销 241 具有向换挡件的档位运动的趋势，从而实现自动锁定档位。

**[0032]** 进行换挡操作时，必须要使自动伸缩销 241 退出档位并且移动，这就需要带动自动伸缩销 241 运动的操作组件。

**[0033]** 操作组件包括：操作件 244 和固定件 245。其中，操作件 244 是操作者实现档位调整的执行部件，且在其用于手握的一端设有防滑把手，以便操作者更可靠地控制操作件 244。自动伸缩销 241 穿过销套 242 和外管 20b，与操作件 244 的另一端构成转动连接。优选自动伸缩销 241 与操作件 244 构成连接的部位形成轴孔，在轴孔中插入轴（图未示）使两者构成可转动的连接。

**[0034]** 固定件 7 固定连接在设有通孔 247 的外管 20b 上，操作件 244 则与该固定件 245 转动连接在一起。为了使操作件 244 与固定件 245 能够构成转动连接，作为一种优选方案，在

## 说明书

固定件 245 和操作件 244 上均形成了连接轴孔 240，安装时在连接轴孔 240 内插入转轴（图未示）即可，这样构成的转动连接不但牢固可靠而且结构简单、便于安装。这样的话，操作件 244 就构成了一个以与固定件 245 构成连接的位置处作为支点的杠杆，当外力驱使操作件的防滑把手向外管 20 靠近时，就可以使得自动伸缩销 241 在操作件 244 的作用下远离换挡件并退出档位，从而未档位调整做好准备。

**[0035]** 为了进一步提高使用的便捷性，操作组件还包括一个使操作件 244 在无外力作用的状态下能够自动复位的复位件 248。优选的复位件 248 采用套接在转轴外围的扭力弹簧，该扭力弹簧的一端抵住操作件 244，另一端抵住固定件 7 或者与固定件 245 固定连接的外管 20b。因而，在没有外力的作用下，扭力弹簧的弹性能量将驱使操作件 244 实现自动复位。当然，此处的复位件 248 也可以基于磁性能量进行设计，这是很容易想到的变换，不作赘述。

**[0036]** 通过上述，我们已经介绍了一种能够便捷、可靠地实现自动换挡的多档位把手机构，仅以在安装了销套 242 的外管 20b 的外侧安装了保护罩 249，从而确保对多档位把手机构和割草机的保护，并使其外形更加美观紧凑。

**[0037]** 为了使换挡锁定板 231 与割草机主体的固定更加牢固，换挡锁定板 231 弯折并向平行于转轴 21 的方向延伸形成止动结构 232，割草机主体则设有与止动结构 232 配合的安装结构（图未示），安装结构可以但并不限于是与割草机主体一体形成的可以容纳止动结构 232 的凹槽，这样一来，换挡锁定板 231 通过螺丝固定在割草机主体上，并且止动结构 232 与安装结构的配合能够有效防止两者发生位置错动，保证两者的安装和限位十分可靠。

**[0038]** 作为一种优选方案，档位包括限位孔 235a、235b、235c 和限位缺口 234，其中，限位孔的数量为 3 个，其中两个相邻设置，位于限位缺口 14 的同一侧，作为正常割草使用时调节把手高度的的第一高度档位 235a 和第二高度档位 235b，从而满足不同身高的人群需求；另外一个限位孔 235c 设置在限位缺口 234 的另一侧，作为用于收纳割草机时折叠把手的收纳档位；限位缺口 234 为一端圆弧形的、可供自动伸缩销 241 运动、用于倒草操作时的活动档位。

**[0039]** 控制系统能综合根据把手 20 的转动位置和把手 20 即时的操作状态控制原动机或/和功能附件。

**[0040]** 这里所指的操作状态至少包括如下：用户在把手 20 上操作装置所进行的操作。在把手 20 为伸缩把手时，操作状态还包括：把手 20 自身的伸缩状态。控制系统在执行控制时至少具有两个基于把手 20 状态的组成因素判断的步骤，只有当这些判断步骤符合设定的组合



## 说明书

时，控制系统才启动原动机使功能附件开始工作，控制系统通过具体的装置构成这些判断的硬件基础，这些装置对控制系统的反馈又基于把手 20 具体的操作情况对它们的触发、关断或其他方式的影响，所以控制系统能根据把手 20 的转动的角度和操作状态

为了实现以上技术方案，作为优选，控制系统包括：至少具有两个控制装置且在其中一个控制装置处于指定状态时其余控制装置才能实现控制的电路系统。

**[0041]** 作为进一步优选方案，当原动机为电机时，控制系统包括：电源（图中未示出）、供电电路（图中未示出）。其中电源通过供电电路为电机供电。除此之外，该控制系统还包括：作用于供电电路且仅在其处于指定状态时电源才能为电机供电的角度预险装置、能被操作进而控制电机电流通断的操作装置。

**[0042]** 操作装置可以是串联到为电机供电的回路中的开关也可以是通过向供电电路发送控制信号的信号装置，之前所介绍的主机开关 SW1 可以作为操作装置的具体实现形式，用户通过操作主机开关 SW1 实现对控制系统中操作装置的控制。

**[0043]** 角度预险装置主要用于实现对把手 20 角度的监控，在把手 20 并没有旋转到指定位置（即能使用户安全操作并相对远离主机 10 的位置）时，用户无论如何操作控制系统中其余的控制装置（比如操作装置），电机都不会被启动，功能附件不工作。

**[0044]** 角度预险装置包括：直接控制供电电路的角度预险开关或/和通过信号指令间接控制供电电路的角度预险信号发生器。

**[0045]** 角度预险开关和角度预险信号发生器区别在于是否直接对供电电路进行控制，它们自身起码具有两种不同的控制模式以实现切换控制。

**[0046]** 其中，角度预险开关可以作为一种开关装置，在设计电路时使其连接在供电电路中为电机供电的回路中，从而通过自身的通断直接实现控制。

**[0047]** 需要说明的一点是，角度预险开关可以通过自身导通而使供电电路为电机供电，也可以通过自身的关断而使供电电路为电机供电，这与供电电路的设计有关，这样的电路设计原理是本领域人员所熟悉的，在此不加赘述。

**[0048]** 角度预险信号发生器既可以是一种开关也可以是一种探测装置，在设计电路时其供电电路中并不参与供电，其控制状态的切换并不能直接通断供电电路中为电机供电的回路，而是通过自身的控制信号对能直接通断电机供电回路的开关装置进行控制。需要说明的是，角度预险信号发生器信号既可以通过有线的模式进行传递也可以通过无线的模式进行传递。

**[0049]** 角度预险开关通过直接导通或切断电机的电能来源来实现控制，其优点在于控制直接可靠，响应及时且便于实现。

## 说明书

**[0050]** 角度预险信号发生器则作为二级控制装置通过自身信号控制直接导通或切断电机的电能来源的开关装置实现控制。其优点在于由于避免直接连接到为其供电的回路中，可以降低控制所需的电流和电压，保证安全。

**[0051]** 在考虑成本的情况下，可以根据具体的情况，选择它们中的一种，如果为了实现双重安全保障，则可以同时设置角度预险开关和角度预险信号发生器，实现双保险。

**[0052]** 作为优选方案，角度预险开关为通过接触触发的触点开关和通过感应触发的位置开关中的一种；角度预险信号发生器为通过接触触发的触点开关和通过感应触发的位置开关中的一种。本发明中所指的触点开关是指通过物理接触对其触点进行接触而实现控制状态切换的一种开关；本发明所指的位置开关是指能感知对象的位置变化从而实现控制状态切换的一种开关。

**[0053]** 作为一种优选方案，当角度预险开关或角度预险信号发生器为触点开关时其实体方案可以采用如图 2、7、8 所示的实施方案或图 9、10 所示的实施方案。

**[0054]** 如图 2、7、8 所示，触点开关 SW1 固定的设置在主机 10 上，其触点朝向转轴 21 的一侧设有其触点，转轴 21 轴向上对应触点开关 SW1 处设有一个触发件 22，当把手 20 带动转轴 21 转动时，触发件 22 会在转至指定角度时（一般而言为把手 20 转至安全位置时）触发触点开关 SW1 的触点。

**[0055]** 如图 9、10 所示，触点开关 SW1'' 安装在把手 20'' 上并随之转动，触点开关 SW1'' 的触点朝向主机 10''，主机 10'' 设置有一个固定的触发件 22''，该触发件 22'' 朝向把手 20'' 的一侧形成有一个斜面 F，当把手 20'' 转动时，触点开关 SW1'' 随之转动，当转动至一定角度时，随着转动的进行，斜面 F 逐渐压迫触点开关 SW1'' 的触点，直至转至指定角度时，斜面 F 完全触发触点开关 SW1''。

**[0056]** 由于把手 20 为伸缩把手时，其伸缩可能会使用户靠近主机 10 从而造成危险隐患。因此作为一种优选方案，电路系统还包括：作用于供电电路且仅在其与角度预险装置均处于各自的指定状态时电源才能为电机供电的距离预险装置（附图未标识）。

**[0057]** 总体而言，距离预险装置与角度预险装置在系统中的作用一样，即在自身控制状态不满足的情况禁止控制系统启动电机，距离预险装置与角度预险装置为控制系统的中两个独立的控制装置，只有当它们均处于允许控制系统启动电机的状态时，操作装置才能被操作用于实现电机的启动。

**[0058]** 所以，距离预险装置在电路结构以及器件选择上也可以采用如角度预险装置同样的技术方案，以上适用于角度预险装置的技术方案均可应用到距离预险装置上。距离预险装置

## 说明书

的区别在于，其实体元件的安装位置需使其能反映把手 20 的伸缩情况。

**[0059]** 当距离预险装置的实体元件采用位置开关时，因为本身位置开关就是监测位置变化的，所以该方案较为容易设计，将位置开关本身设置在主机 10 上，将被其监测的元件或结构设置在把手 20 的用于操作的一端，这样一来位置开关即能通过监测把手 20 用于操作的一端是否足够远离而实现控制，当然也可以采用相反设计。

**[0060]** 当距离预险装置的实体元件采用触点开关 SW2 时，参照图 5、6 所示，作为一种优选方案，该触点开关 SW2 安装在伸缩关节 20b 的顶端，伸缩关节 20b 为套管结构，触点开关 SW2 的触点 P 穿过伸缩关节 20b 的管壁而伸入套管结构的内部，伸缩关节 20a 插入到伸缩关节 20b 中，其底端设有一触发件 20a'，当伸缩关节 20a 被拉出伸缩关节 20b 时（即把手 20 处于伸展状态），触发件 20a' 通过接触触发触点开关 SW2 的触点 P。

**[0061]** 另外，作为一种优选方案，为了防止电机断电后，功能附件仍在惯性的作用下运动从而对用户造成伤害，控制系统还包括：在电机断电时通过物理接触对功能附件进行制动的制动系统，制动系统至少受到电路系统控制。在电路系统中的控制装置中任意一个控制使电机断电，那么控制系统则控制制动系统使其阻止功能附件继续在惯性的作用下运动，实现紧急刹车。这种制动可以对功能附件进行接触得以实现也可以通过对与之固定连接的传动件接触实现制动。在制动系统中电控制对实体装置的控制可以通过电磁体吸引和释放得以实现，这些都是本领域技术人员所熟知的技术手段，在此不加赘述。

**[0062]** 以上显示和描述了本发明的基本原理、主要特征和优点。本行业的技术人员应该了解，上述实施例不以任何形式限制本发明，凡采用等同替换或等效变换的方式所获得的技术方案，均落在本发明的保护范围内。

## 说明书附图

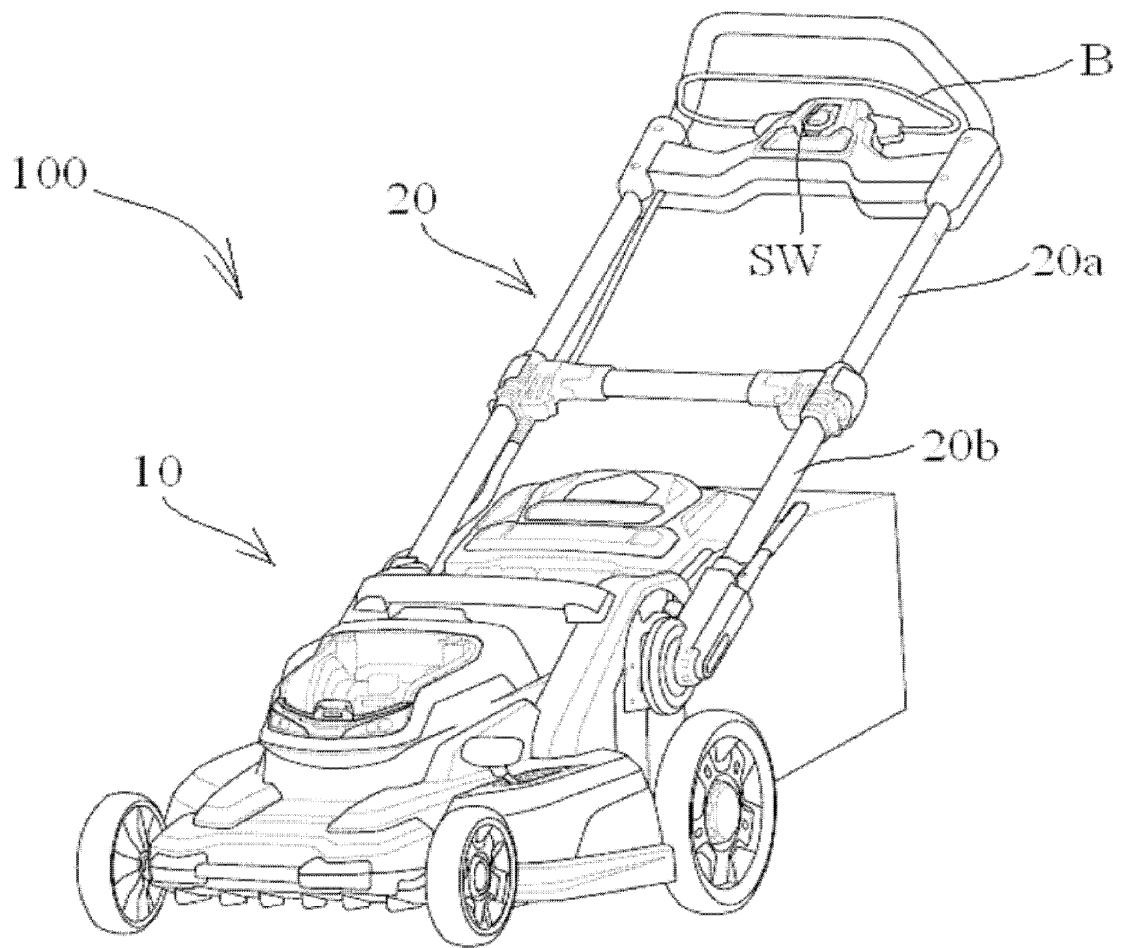


图 1



## 说明书附图

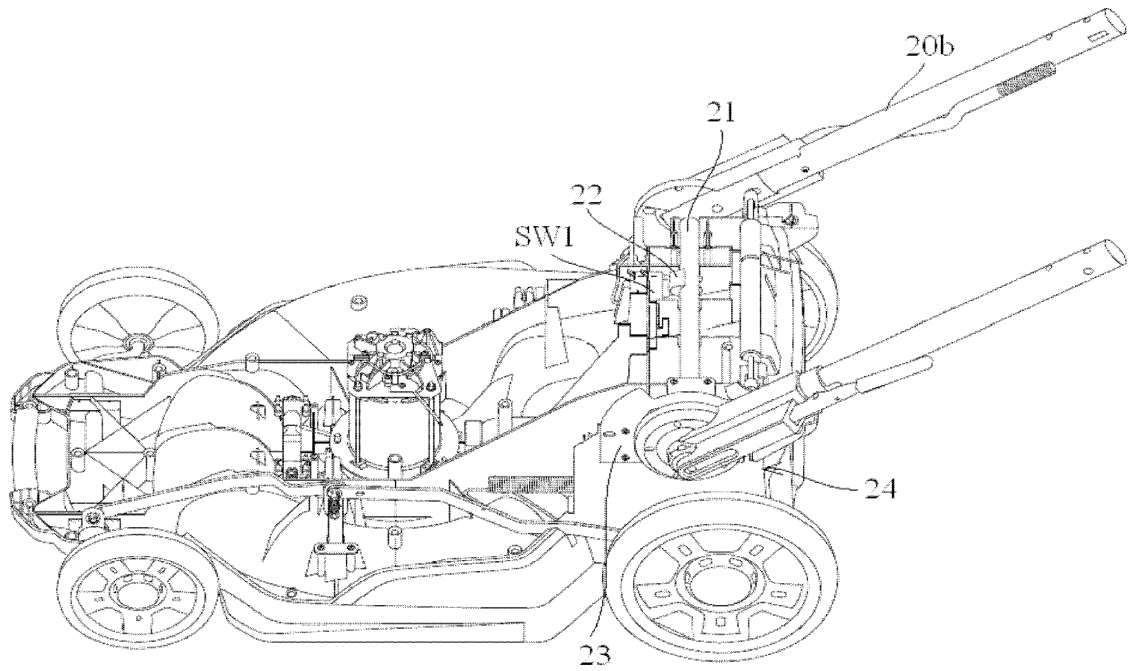
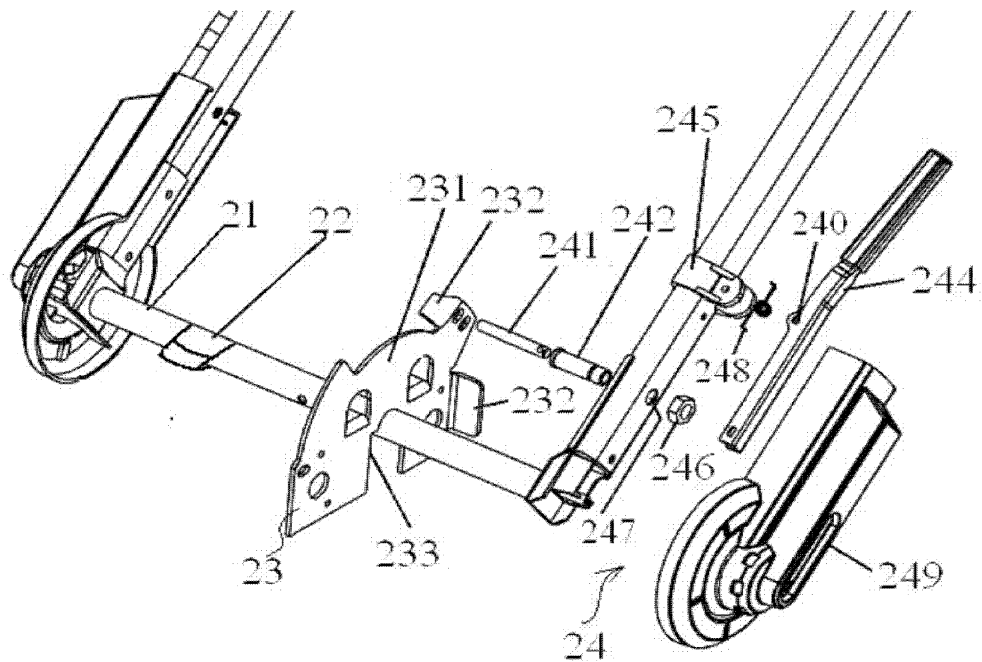


图 2





## 说明书附图

图 3

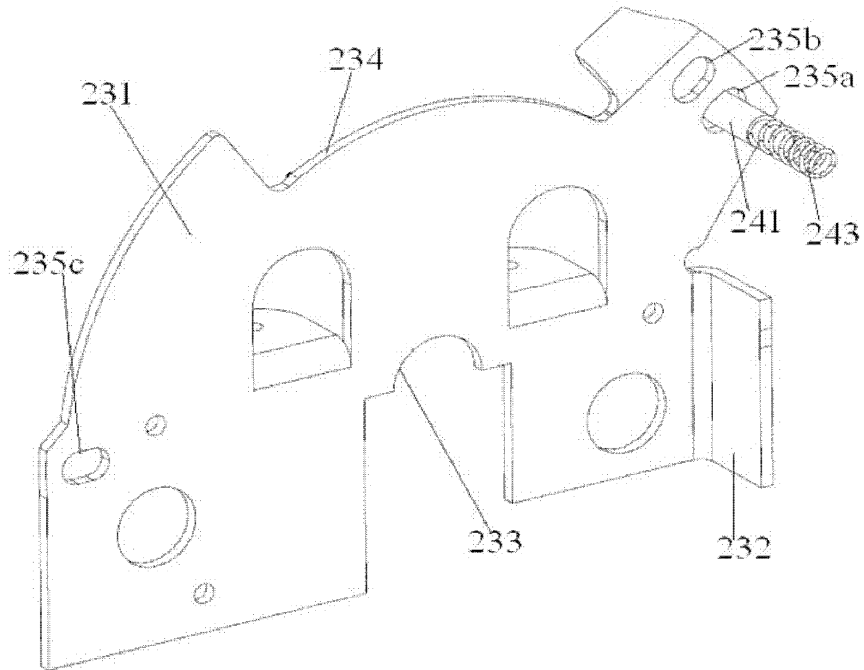


图 4

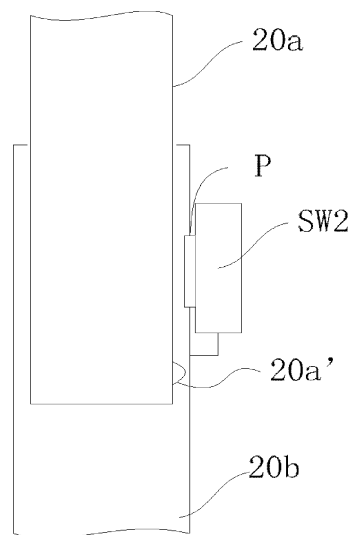


图 5



## 说明书附图

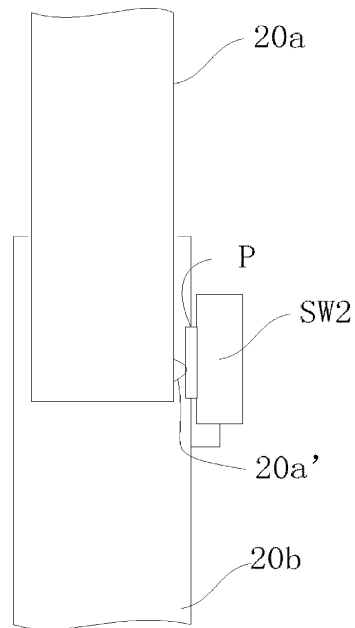


图 6

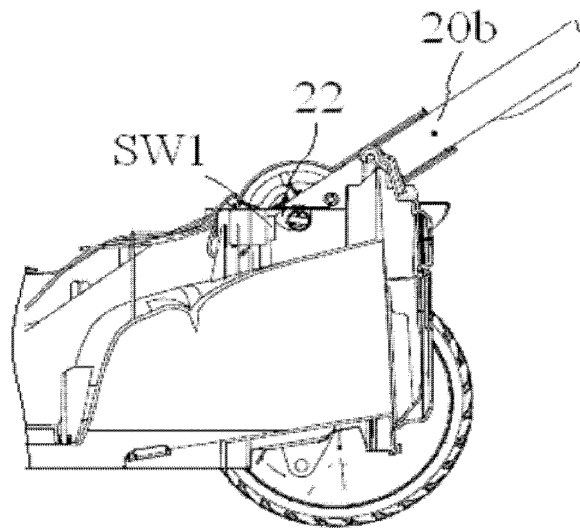


图 7



## 说明书附图

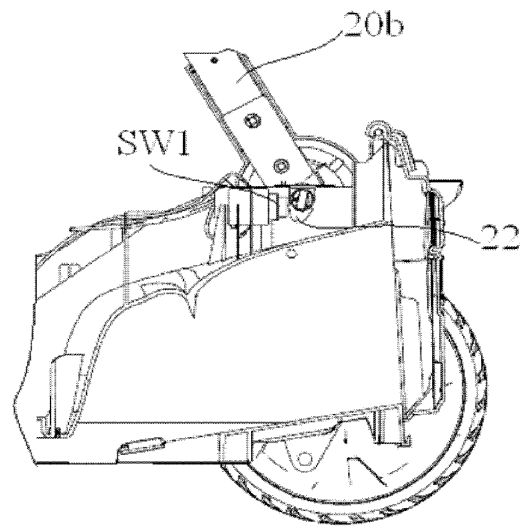


图 8

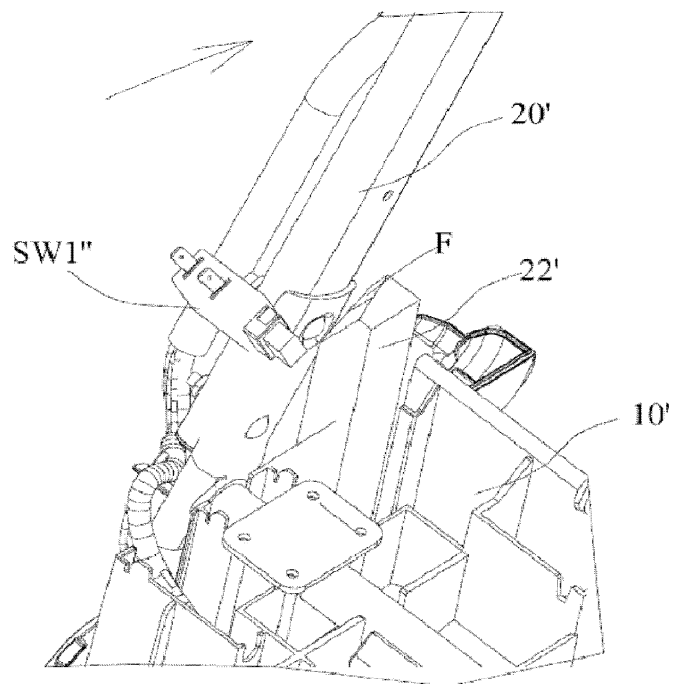


图 9





## 说明书附图

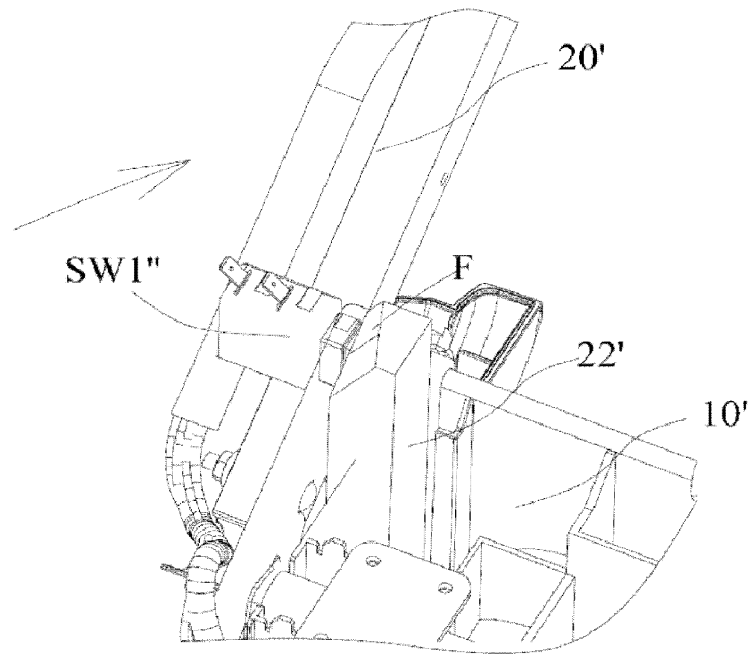


图 10



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/250,408	08/29/2016	3671	1600	78873.176US2	20	2

CONFIRMATION NO. 8522

UPDATED FILING RECEIPT



34018  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

Date Mailed: 11/15/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Toshinari Yamaoka, Nanjing, CHINA;  
Fangjie Nie, Nanjing, CHINA;  
Haishen Xu, Nanjing, CHINA;

**Applicant(s)**

CHERVON INTELLECTUAL PROPERTY LIMITED, Road Town, VIRGIN ISLANDS, BRITISH;

**Assignment For Published Patent Application**

Chervon Intellectual Property Limited

**Power of Attorney:** The patent practitioners associated with Customer Number 34018

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/511,490 10/10/2014

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

CHINA 201310468919.9 10/10/2013

CHINA 201410167041.X 04/23/2014

**Permission to Access Application via Priority Document Exchange:** No

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

**If Required, Foreign Filing License Granted:** 09/08/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/250,408**

**Projected Publication Date:** 02/23/2017

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

GARDENING TOOL

**Preliminary Class**

056

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

**LICENSE FOR FOREIGN FILING UNDER**  
**Title 35, United States Code, Section 184**  
**Title 37, Code of Federal Regulations, 5.11 & 5.15**

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

---

**SelectUSA**

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875					Application or Docket Number 15/250,408	
<b>APPLICATION AS FILED - PART I</b>						
(Column 1)		(Column 2)		SMALL ENTITY		OR
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)	OTHER THAN SMALL ENTITY	
BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A	N/A		N/A	280
SEARCH FEE <small>(37 CFR 1.16(k), (j), or (m))</small>	N/A	N/A	N/A		N/A	600
EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A	N/A		N/A	720
TOTAL CLAIMS <small>(37 CFR 1.16(i))</small>	20	minus 20 = *			OR	x 80 = 0.00
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	2	minus 3 = *				x 420 = 0.00
APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).					0.00
MULTIPLE DEPENDENT CLAIM PRESENT <small>(37 CFR 1.16(j))</small>						0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL		TOTAL	1600
<b>APPLICATION AS AMENDED - PART II</b>						
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	OTHER THAN SMALL ENTITY
	Total <small>(37 CFR 1.16(i))</small>	*	Minus **	=	x =	OR
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus ***	=	x =	OR
	Application Size Fee <small>(37 CFR 1.16(s))</small>					OR
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>					OR
				TOTAL ADD'L FEE		OR
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	OTHER THAN SMALL ENTITY
	Total <small>(37 CFR 1.16(i))</small>	*	Minus **	=	x =	OR
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus ***	=	x =	OR
	Application Size Fee <small>(37 CFR 1.16(s))</small>					OR
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>					OR
				TOTAL ADD'L FEE		OR
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.						

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Toshinari Yamaoka	)	
		)	Examiner:
Serial No.:	15/250,408	)	
		)	Group Art Unit: 3671
Filed:	August 29, 2016	)	
		)	Atty. Docket No.: 078873.176US2
Title:	GARDENING TOOL	)	

**RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Corrected Application Papers mailed on September 9, 2016, enclosed is the following:

- One complete set of Replacement Sheets, Figs. 1 - 10.

No fee is believed due. However, the Commissioner is authorized to charge any fee deficiency which may be required or credit overpayment to deposit account number 50-2428 in the name of Greenberg Traurig, LLP.

Respectfully submitted,

Date: November 7, 2016

By: /Gary R. Jarosik/  
Gary R. Jarosik, Reg. No. 35,906  
Greenberg Traurig, LLP  
77 W. Wacker Drive/Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

REPLACEMENT SHEET

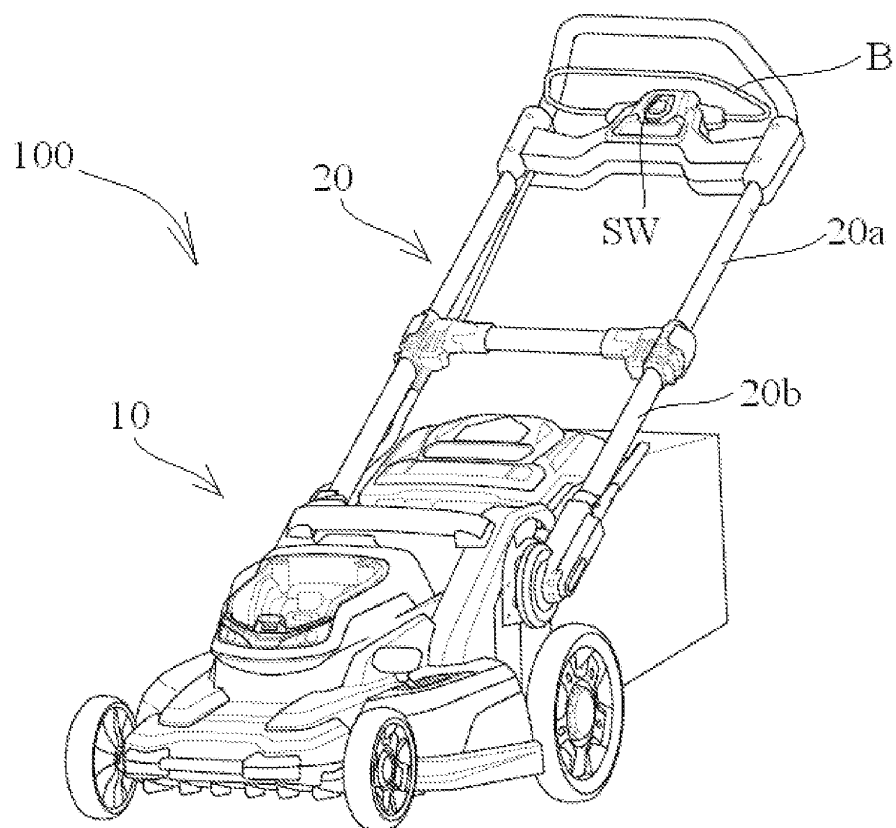


FIG.1



# REPLACEMENT SHEET

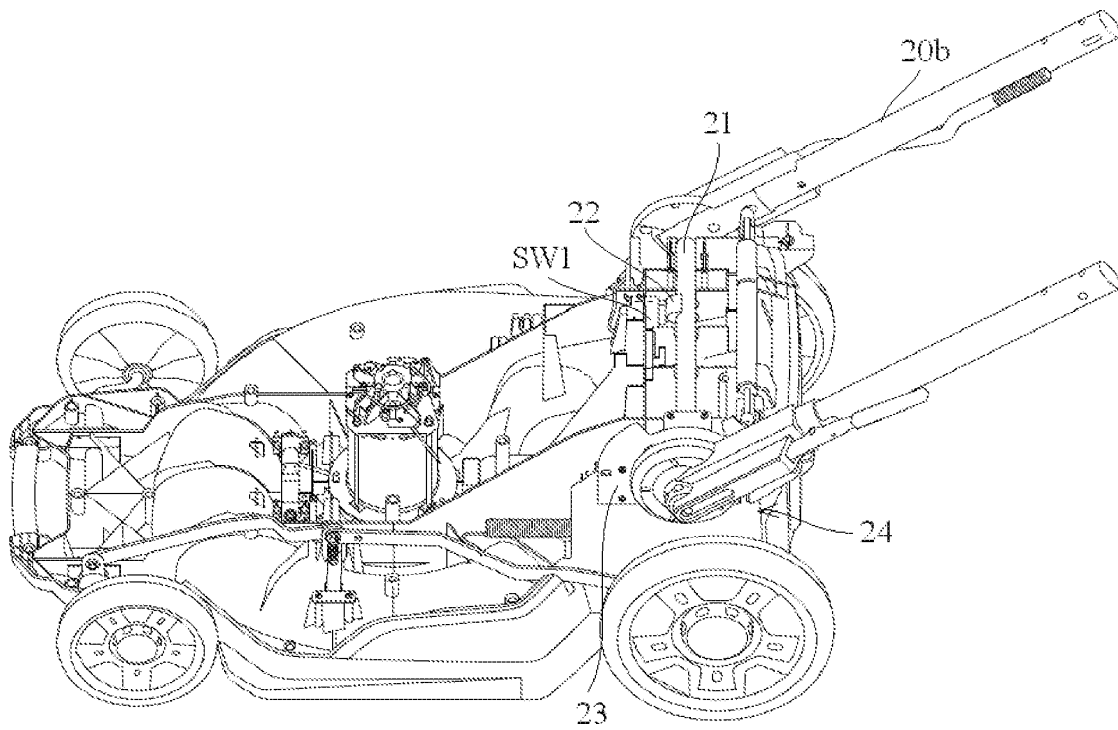


FIG. 2

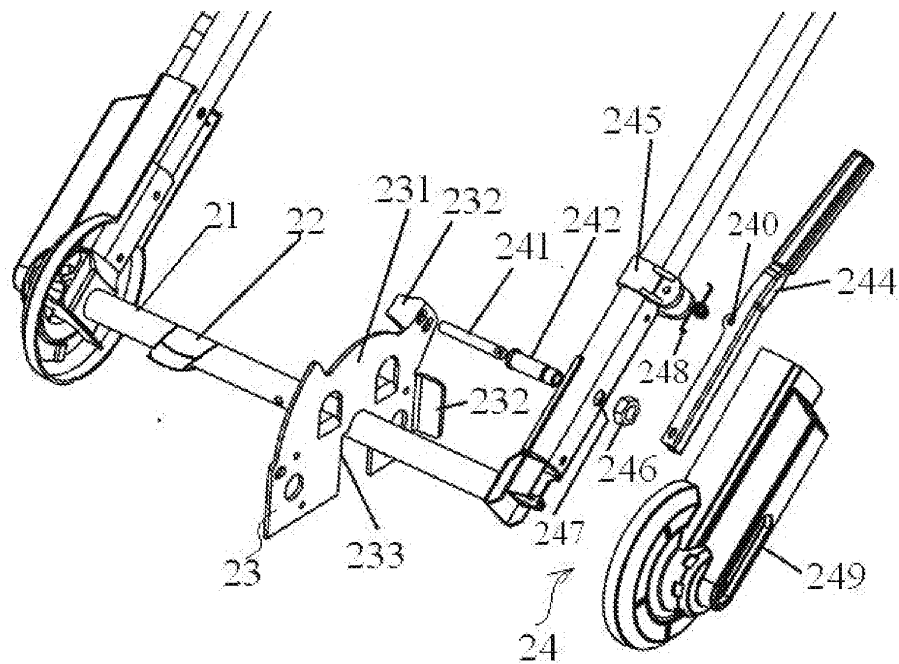


FIG. 3

# REPLACEMENT SHEET

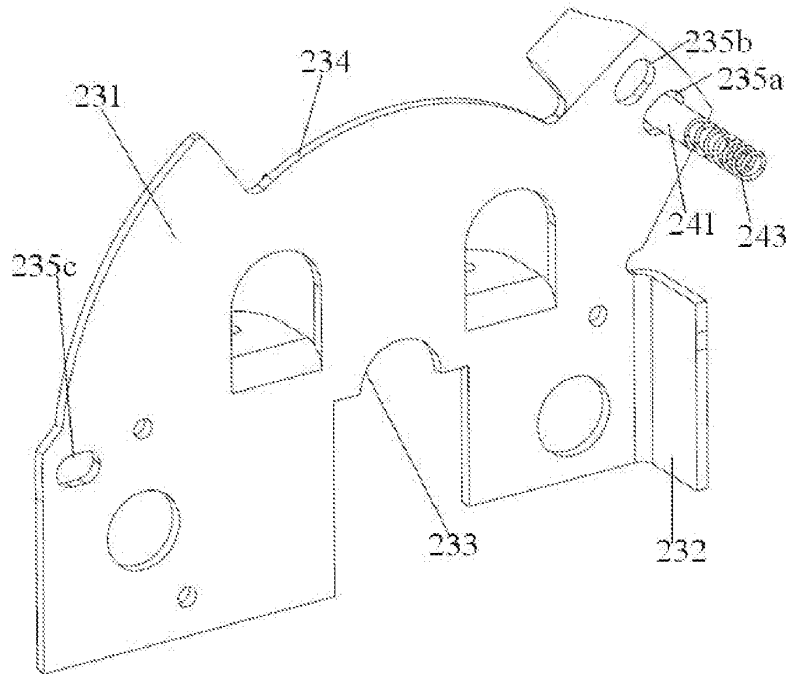


FIG. 4

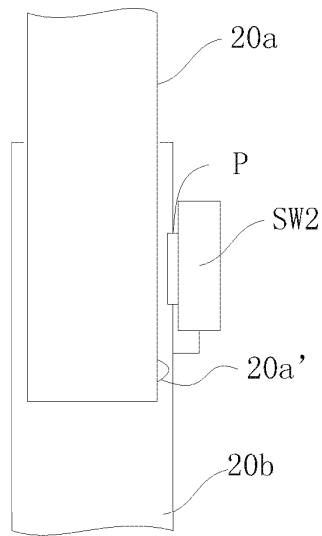


FIG. 5

REPLACEMENT SHEET

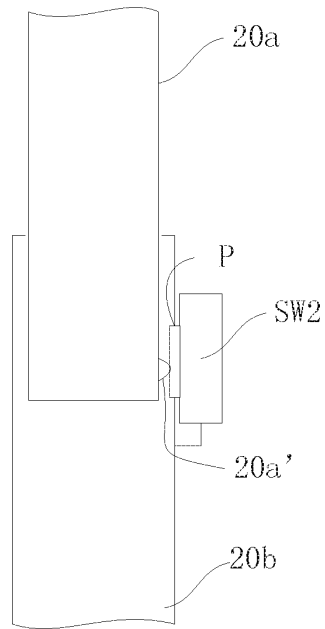


FIG. 6

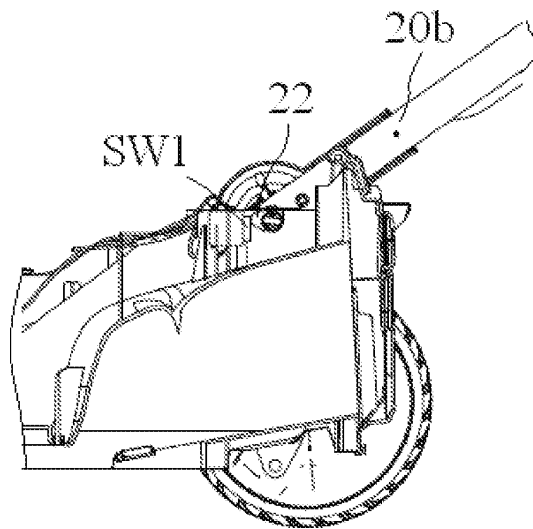


FIG. 7

REPLACEMENT SHEET

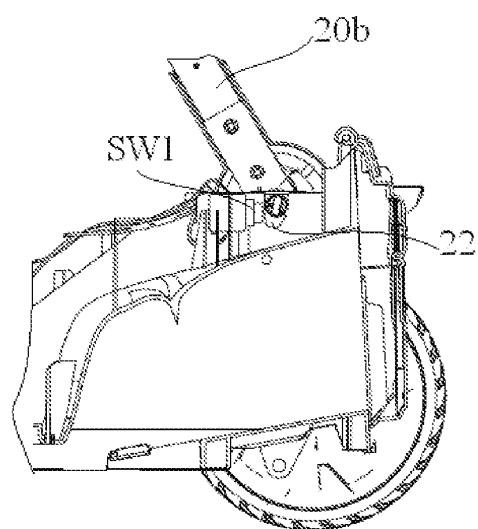


FIG. 8

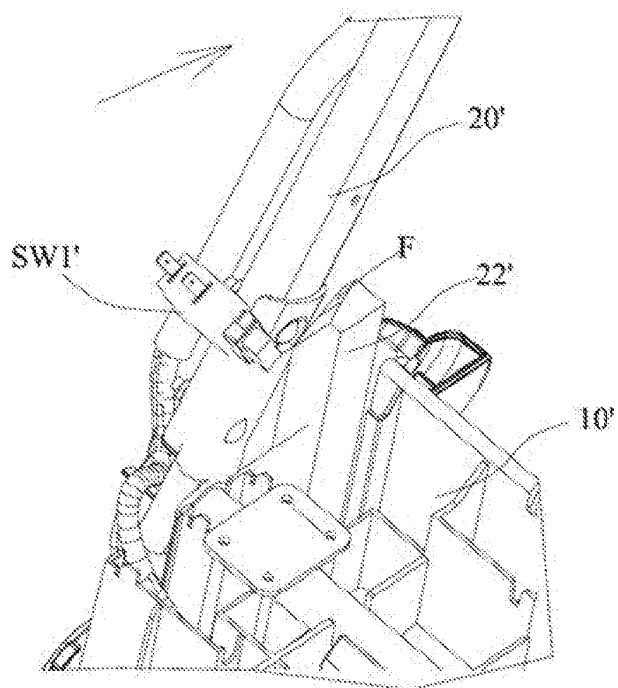


FIG. 9

REPLACEMENT SHEET

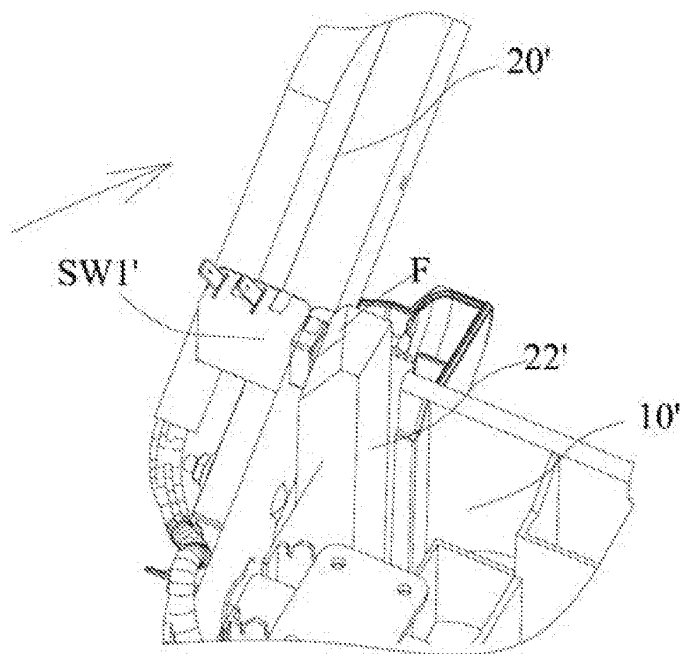


FIG.10

Electronic Acknowledgement Receipt	
EFS ID:	27433044
Application Number:	15250408
International Application Number:	
Confirmation Number:	8522
Title of Invention:	GARDENING TOOL
First Named Inventor/Applicant Name:	Toshinari Yamaoka
Customer Number:	34018
Filer:	Gary R. Jarosik/Cynthia Tapia
Filer Authorized By:	Gary R. Jarosik
Attorney Docket Number:	78873.176US2
Receipt Date:	07-NOV-2016
Filing Date:	29-AUG-2016
Time Stamp:	12:35:32
Application Type:	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	078873_176US2Trans.pdf	189780	no	2
			ef624205da908991aeb70ae0540ee01f3efe9c63		

### Warnings:

<b>Information:</b>					
2	Applicant Response to Pre-Exam Formalities Notice	078873_176US2Response.pdf	99786	no	1
			a72ed422955f2fb7f4a17ded64984fda1d9c27b3		
<b>Warnings:</b>					
<b>Information:</b>					
3	New or Additional Drawings	078873_176US2Replacements.pdf	434740	no	6
			d41504b8644892b3e6b8e869bbece5d384492bda		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			724306		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

<b>TRANSMITTAL FORM</b>  <i>(to be used for all correspondence after initial filing)</i>	Application Number	15/250,408
	Filing Date	August 29, 2016
	First Named Inventor	Toshinari Yamaoka
	Art Unit	3671
	Examiner Name	
Total Number of Pages in This Submission	Attorney Docket Number	078873.176US2

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): - Response to Notice to File Corrected Application Papers - Replacement Sheets (6 pgs.)
Remarks Filed via EFS Web		
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	Greenberg Traurig, LLP	
Signature	/Gary R. Jarosik/	
Printed name	Gary R. Jarosik	
Date	November 7, 2016	Reg. No. 35,906

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
Signature	/Cynthia Tapia/		
Typed or printed name	Cynthia Tapia	Date	November 7, 2016

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		15250408
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit	3671	
	Examiner Name		
	Attorney Docket Number	78873.176US2	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6737598		2004-05-18	Allen et al.	
	2	4043102		1977-08-23	Uhlinger et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20140331809	A1	2014-11-13	Mikula et al.	
	2	20140190141	A1	2014-07-10	Edholm et al.	
	3	20140102063	A1	2014-04-17	Yamaoka et al.	
	4	20120317821	A1	2012-12-20	Tsuchiya et al.	

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		15250408	
	Filing Date		2016-08-29	
	First Named Inventor	Toshinari Yamaoka		
	Art Unit	3671		
	Examiner Name			
	Attorney Docket Number	78873.176US2		

	5	20100162674	A1	2010-07-01	Eaton et al.	
	6	20090217636	A1	2009-09-03	Loxterkamp et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

#### FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> i	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1	1299582	CN		2001-06-20	Nanjing Science & Engineering		<input checked="" type="checkbox"/>
	2	101897261	CN		2010-12-01	Ningbo Daye Garden Machinery Co Ltd		<input checked="" type="checkbox"/>
	3	102683052	CN		2012-09-19	Hai An Weishi Heavy Machinery Co Ltd		<input checked="" type="checkbox"/>
	4	201146132	CN		2008-11-05	Guoxiong Hu		<input checked="" type="checkbox"/>
	5	201821663	CN		2011-05-11	Nanjing Chervon Ind Co Ltd		<input checked="" type="checkbox"/>
	6	202873363	CN		2013-04-17	Nanjing Chervon Ind Co Ltd		<input checked="" type="checkbox"/>
	7	102845186	CN		2013-01-02	Nanjing Chervon Ind Co Ltd		<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		15250408
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit	3671	
	Examiner Name		
	Attorney Docket Number	78873.176US2	

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>
	1		<input type="checkbox"/>
If you wish to add additional non-patent literature document citation information please click the Add button			
EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
<p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>			
<p><sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.</p>			

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	15250408
	Filing Date	2016-08-29
	First Named Inventor	Toshinari Yamaoka
	Art Unit	3671
	Examiner Name	
	Attorney Docket Number	78873.176US2

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Gary R. Jarosik/	Date (YYYY-MM-DD)	2016-09-13
Name/Print	Gary R. Jarosik	Registration Number	35906

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Yamaoka et al.	)	
	)	
Serial No.: 15/250,408	)	Examiner:
	)	
Filed: August 29, 2016	)	Group Art Unit: 3671
	)	
Title: GARDENING TOOL	)	Docket No. 078873.176US2

**CERTIFICATION STATEMENT**

**FILED VIA EFS-WEB**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

The Information Disclosure Statement being filed concurrently herewith should be considered because it is submitted, pursuant to 37 C.F.R. §1.97(b)(3) before the mailing of a first Office Action on the merits. Therefore, no fee is required.

Respectfully submitted,

Date: September 13, 2016

By: /Gary R. Jarosik/  
Gary R. Jarosik, Reg. No. 35,906  
Greenberg Traurig, LLP  
77 W. Wacker Drive - Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

CHI 67397864v1

-----  
**Certificate of Electronic Transmission:** The undersigned hereby certifies that this document and its attachments are being transmitted electronically via EFS-Web to the United States Patent and Trademark Office on this 13<sup>th</sup> day of September, 2016.

By: /Cynthia Tapia/  
Name: Cynthia Tapia

[19] 中华人民共和国国家知识产权局

[51] Int. Cl<sup>7</sup>

A01D 34/00

## [12] 发明专利申请公开说明书

[21] 申请号 99120604.5

[43] 公开日 2001 年 6 月 20 日

[11] 公开号 CN 1299582A

[22] 申请日 1999.12.10 [21] 申请号 99120604.5

[71] 申请人 南京理工大学

地址 210094 江苏省南京市孝陵卫 200 号

共同申请人 江苏省技术进出口公司

[72] 发明人 王华坤 范元勋 宋德锋  
张宗平 徐鲁萍 王飞雁

[74] 专利代理机构 南京理工大学专利事务所

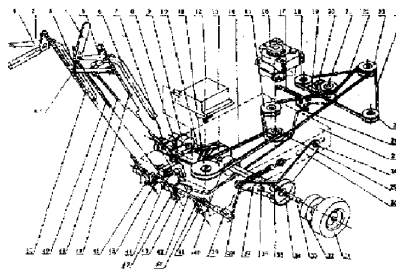
代理人 朱显国

权利要求书 2 页 说明书 6 页 附图页数 2 页

[54] 发明名称 联动操作随进式割草机

[57] 摘要

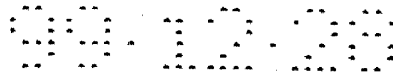
本发明涉及一种联动操作随进式割草机,它包括机架、发动机、传动系统、控制系统、行走系统,其特征在于通过联动轴以及在位把手等控制组件的设计,实现了驱动、制动、行走、高度调节、割草操作的联动控制。本发明与现有技术相比,其优点是结构简单、操作方便、安全性好,在位把手按下或抬起的状态可确保割草机在工作行进及非工作状态的高度安全性,可有效避免因操作不当带来的伤割。本发明可广泛适用于各种随进式割草机中。



ISSN 1008-4274

知识产权出版社出版





## 权利要求书

1、一种联动操作联动操作随进式割草机，它包括机架[27]、发动机[16]、传动系统、控制系统、行走系统，其特征在于控制系统的在位把手[1、5]铰接拉杆[50、47]，拉杆[50、47]与左右铰接板[46、41]铰接，左、右铰板[46、41]空套在联动轴[42]上，左、右铰接板[46、41]轴套上开有一槽，联动轴[42]上固联的圆柱销[59、60]嵌入左、右铰板[46、41]槽口，联动轴[42]两头固联制动曲柄[39]，制动曲柄[39]铰接制动拉杆[38]，制动拉杆[38]与制动摆板[37]铰接，制动摆板[37]还联接一拉簧[36]，制动环[34]一端铰接制动摆板[37]，另一端铰接在后支板[35]上，制动环[34]套在驱动轮[31]制动毂[32]上，构成联动制动系统。

2、根据权利要求 1 所述的联动操作随进式割草机，其特征在于：在位把手[1、5]铰接拉杆[50、47]，拉杆[50、47]上有一支耳与联动杠杆[3]两端铰接，联动杠杆[3]端有二个长槽，铰接螺钉[61]可在槽中滑移。联动杠杆[3]中间又与驱动拉杆[48]铰接，驱动拉杆[48]又与驱动张紧轮铰板[8]铰接，构成联动行走操作系统。

3、根据权利要求 1 或 2 所述的联动操作随进式割草机，其特征在于：联动轴[42]穿过机架[27]两翼，并可相对转动，联动轴[42]两边各设有一只圆柱销[59、60]，嵌入左、右铰板[46、41]轴套的槽口中，左、右铰板[46、41]轴套槽宽与圆柱销间留有一定间隙，左、右铰板[46、41]相对联动轴[42]能旋转一个角度。使得左、右铰板[46、41]任一个翻转时，都能联动制动曲柄[39]、凸轮铰板[43]。

4、根据权利要求 1 或 2 所述的联动操作随进式割草机，其特征在于：变速箱[12]单边输出带动驱动主动带轮[7]，带动两根三角带[10]，使驱动从动带轮[13]旋转，同时带动差速器[40]旋转，差速器[40]的外壳[55]支承在前后支板[30]、[35]上，最后动力传递到两驱动轮[31]，由此构成轮子驱动系统。

5、根据权利要求 1 或 4 所述的联动操作随进式割草机，其特征在于：在位把手[1、5]铰接拉杆[50、47]，拉杆[50、47]又与左、右铰接板[46、41]铰接，套在联动轴[42]上，凸轮[44]与凸轮铰板[43]固联，并空套在联动轴[42]上，凸轮[44]上方又置一棘爪[45]，构成刀子动力输入、切断互锁联动装置。

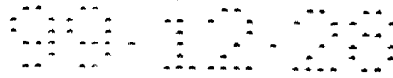
6、根据权利要求 1 或 5 所述的联动操作随进式割草机，其特征在于：刀子驱动手柄[4]与拉杆[49]铰接，拉杆[49]又与凸轮铰板[43]铰接，凸轮铰板[43]另一端又与拉杆[26]铰接，拉杆[26]另一端铰接于摆板[19]，摆板[19]上固接活

## 权 利 要 求 书

---

动张紧轮[21]，左边又固接一制动块[20]，中间与机架铰接，摆板[19]上还联接一复位制动弹簧[17]，由此组成刀子张紧及制动联动装置。

7、根据权利要求 1 或 6 所述的联动操作随进式割草机，其特征在于：后支板[35]一端与机架[27]铰接，另一端与轴承座固联，轴承座又与前支板[30]铰接，前支板[30]与铰接螺钉[28]铰接，铰接螺钉[28]能在机架[27]槽内移动，轴承座[58]支撑在差速器[40]外壳[55]上，轮轴[33]分别是从小差速器[40]的外壳[55]中伸出，轮轴[33]上分别安装两驱动轮[31]，由此构成割草机调高系统。



## 说 明 书

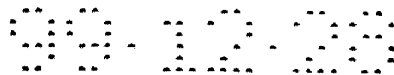
### 联动操作随进式割草机

本发明涉及一种草地机械，特别是一种联动操作随进式割草机。

现有随进式割草机一般分为商用和家用两类。商用机马力大，割草宽度宽，割草效率高，但操作复杂，体积庞大，移动困难，安全性较差，需专职人员操作。而家用割草机轻便灵巧，安全可靠，但马力小，寿命短，割草宽度小，割草效率低。现有随进式割草机操作复杂，且发动机关闭后，只有当操作者把捏手扣在某一位置，整机才处于制动状态，一旦操作者遗忘扣捏手，则会造成整机非正常移位或滑坡等危险。

本发明的目的在于提供一种具有联动操作功能，结构简单，操作方便，安全性好的联动操作随进式割草机。

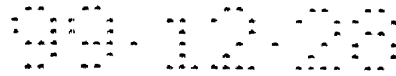
实现本发明目的的技术解决方案为：一种联动操作随进式割草机，它包括机架、发动机、传动系统、控制系统，其特征在于控制系统的在位把手铰接拉杆，拉杆与左右铰板铰接，左、右铰板空套在联动轴上，左、右铰板的轴套上开有一槽口，联动轴上固联的圆柱销嵌入左、右铰板的槽口，联动轴两头固联制动曲柄，制动曲柄铰接制动拉杆，制动拉杆与制动摆板铰接，制动摆板还联接一拉簧，制动环一端铰接制动摆板，另一端铰接在后支板上，制动环套在驱动轮制动毂上；联动轴上还空套一凸轮铰板，凸轮铰板固联的凸轮上方机架上又铰接一棘爪，两者之间可互锁联动，凸轮铰板又铰接拉杆 26 和拉杆 49，拉杆 49 铰接刀子驱动手柄，拉杆 26 铰接摆板，构成联动操作系统；在位把手铰接拉杆 50、47，拉杆 50、47 上有一支耳与联动杠杆 3 两端铰接，联动杠杆 3 端有二个长槽，铰接螺钉 61 可在槽中滑移。联动杠杆 3 中间又与驱动拉杆 48 铰接，驱动拉杆又与驱动张紧轮铰板 8 铰接，构成联动行走操作系统；联动轴 42 穿过机架 27 两翼，并可相对转动，联动轴两边各设有一只圆柱销 59、60，嵌入左、右铰板 46、41 轴套的槽口中，左、右铰板轴套槽宽与圆柱销间留有一定间隙，左、右铰板 46、41 相对联动轴 42 能旋转一个角度。使得左、右铰板 46、41 任一个翻转时，都能联动制动曲柄 39，凸轮铰板 43。变速箱 12 单边输出带动驱动主动带轮 7，带动两根三角带 10，使驱动从动带轮 13 旋转，同时带动差速器旋转，差速器 40 的外壳 55 支承在前后支板 30、35 上，最后动力传递到两驱动轮 31，由此构成轮子驱动系统；在位把手铰接拉杆 50、47，拉杆 50、47 又与左、右铰接板 46、41 铰接，套在联动轴 42 上，凸轮 44 与凸轮铰板 43



## 说明书

固联，并空套在联动轴 42 上，凸轮 44 上方又置一棘爪 45，构成刀子动力输入、切断互锁联动装置；刀子驱动手柄 4 与拉杆 49 铰接，拉杆 49 又与凸轮铰板 43 铰接，凸轮铰板另一端又与拉杆 26 铰接，拉杆 26 另一端铰接于摆板 19，摆板上固接活动张紧轮 21，左边又固接一制动块 20，中间与机架铰接，摆板上还联接一复位制动弹簧 17，由此组成刀子张紧及制动联动装置；后支板 35 一端与机架 27 铰接，另一端与轴承座固联，轴承座又与前支板 30 铰接，前支板 30 与铰接螺钉 28 铰接，铰接螺钉 28 能在机架 27 槽内移动，轴承座 58 支撑在差速器 40 外壳 55 上，轮轴 33 分别是差速器的外壳中伸出，轮轴 33 上分别安装两驱动轮 31，由此构成割草机调高系统。

本发明的原理是：当按下任一在位把手，联动轴旋转一定角度，棘爪被放下，轮毂制动解脱，按下刀子驱动手柄，活动张紧轮 21 张紧三角带 22，发动机带动主皮带轮 29 传递动力到中间刀轴带轮 23 上层，通过下层皮带，带动刀子带轮 18、25 高速旋转，进入割草状态；另一路动力通过主皮带轮上层，由三角带 14 带动变速箱输入带轮 11 旋转，经变速箱变速，带动驱动主动带轮 7，此时驱动张紧轮 9 仍处于松脱位置，不能传递动力，驱动从动带轮处于静止，只能前后推拉割草机，不能自行行走，只有当按下另一在位把手，驱动张紧轮下摆，张紧三角带 10，带动驱动从动带轮 13，通过差速器，驱动轮胎行走。当驱动从动带轮旋转时带动差速器外壳绕两轮轴旋转，同时带动中间销轴 53 绕轮轴 33 旋转，再带动行星锥齿轮 52、57 作行星运动最后将动力分配到两边锥齿轮 54、56，驱动轮轴 33，带动驱动轮 31 直线前进或转弯，采用差速器的目的是使动力得到合理分配，转弯变得轻松自如。两轮速度与驱动从动带轮 13 转速之间关系满足  $n_1 = n_2 + n_3$ 。  $n_1$ ：驱动从动带轮 13 转速；  $n_2$ ：左驱动轮转速；  $n_3$ ：右驱动轮转速。割草机无论前进、转弯都满足这一速度关系式。在上述工作状态，松脱任一在位把手，使驱动张紧带轮 9 上摆，切断驱动轮毂动力，割草机停止自行，再松脱另一在位把手，则割草机紧急制动（包括刀子）。本发明割草机结构原理为：刀子动力的接合、切断、制动主要通过摆板 19 的左右摆动来实现，摆板 19 与机架 27 铰接，可自由摆动，摆板 19 左边又固联制动块 20，右边又铰接一拉杆 26，拉杆 26 又与凸轮铰板 43 铰接，凸轮铰板 43 与凸轮 44 固联，凸轮 44 与棘爪 45 互锁，凸轮铰板 43 另一端又与拉杆 49 铰接，拉杆 49 又与刀子驱动手柄 4 铰接，当按下这手柄，凸轮铰板 43 转一角度，拉紧拉杆 26

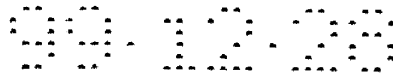


## 说明书

使摆板 19 右摆，通过与摆板 19 固联的活张紧轮 21 将三角带 22 张紧，动力被输入，刀子开始高速旋转。但这时若松开刀子驱动手柄 4，凸轮 44 不能被锁住，摆板 19 在弹簧 17 作用下左摆，制动块 20 将刹住刀子带轮 18，这时动力也被切断。只有按下一个在位把手 1（或 5），提拉拉杆 50（或 47），使得左铰板 46（或右铰板 41）转过一角度，左铰板 46 和右铰板 41 设有一开口槽，联动轴 42 上有两个圆柱销 59 镶嵌在槽中，在左、右铰板 46、41 转过一角度时，带动联动轴 42 也翻过一角度，左边圆柱销（伸出较长的一端向下）转过一角度，棘爪 45 被放下，再按下刀子驱动手柄 4 凸轮 44 就与棘爪 45 互锁，三角带 22 被张紧，动力输入，刀子高速旋转处于割草状态。当在位把手 1 和 5 松开，左、右铰板 46、41 在弹簧 36（也可在左、右铰板 46、41 上另加弹簧）作用下，带动联动轴 42 向相反方向回转，左边长圆柱销 60 抬起，棘爪 45 向上翻起，释放凸轮铰板，摆板 19 左摆，松脱三角带 22，制动刀子带轮 18、23、25。当按下任一在位手柄 1（或 5）同时，除放下棘爪 45 的功能外，由于左、右铰板 46、41 通过圆柱销 60、59 使联动轴 42 翻过一角度，由于制动曲柄 39 与联动轴 42 固联，也转过相同角度，拉动与之相铰接的制动拉杆 38，牵动制动摆板 37 向后翻转一角度，松脱制动环 34，释放驱动轮 31，进入自行走状态。松开在位把手 1 或 5，在弹簧 36 作用下制动摆板 37 向前翻转，抽紧制动环 34，这时驱动轮 31 被制动。

行走控制由在位把手拉杆 50、47 联动杠杆 3、驱动拉杆 48、驱动张紧轮 9 来实现。当按下任一在位把手 1（或 5），拉杆 50（或 47）上升，带动联动杠杆 3 一端上升，联动杠杆 3 处于倾斜位置，这时中间驱动拉杆 48 也上升一段行程，驱动拉杆 48 又与驱动张紧轮铰板 8 铰接，使之向下翻过一角度，处于待张紧位置，由于这时驱动轮 31 制动被解脱，可实现前后自由推拉割草机。当再按下另一个在位把手 5（或 1），另一个拉杆 47（或 50）又牵动联动杠杆 3 上升全行程，整个联动杠杆 3 处于水平位置，联动杠杆 48 又上升一段行程，使驱动张紧轮铰板 8 向下再翻过一角度，驱动三角带 10 被张紧，割草机进入自动行进状态。若需短时改变一下速度（如转弯时），要少许放松一下在位把手 1（或 5），就能实现无级减速。

本发明的人字调高机构，由后支板 35、前支板 30、轴承座 58、铰接螺钉 28 组成。后支板 35 与机架 27 铰接，可自由翻转，后支板 35 另一端又与轴承



## 说明书

座固联，轴承座 58 又与前支板 30 后端铰接，前支板 30 前端与铰接螺钉 28 铰接，铰接螺钉 28 可在机架 27 槽中前后移动。当移动到所需位置度就可将铰接螺钉 28 拧死，固定前、后支板 30、35，使穿过轴承座 58 的轮轴 33 保持在一定高度，完成割草机高度的调整，适应割各种高度的草坪。

本发明与现有技术相比，其显著优点是：结构简单、操作方便、安全性好，联动操作系统可实现以下功能：

- 1、刀子动力输入与切断、刀子的制动与解脱；
- 2、驱动轮的制动与解脱；
- 3、实现前后推拉移动割草机及前后推拉往复割草的功能；
- 4、实现行走速度无级调速；
- 5、实现紧急制动；
- 6、实现原地转弯。

实现上述功能具有以下优点：

1、当发动机发动后，一个把手都不操作，刀子动力处于切断状态，保证在准备割草过程中的安全；当正常割草时，操作者突然放开两在位把手，刀子驱动手柄锁定解脱，刀子动力切断，同时刀子制动，数秒钟内刀子停转，保证操作人员及其它人员到割草机旁没有危险性；

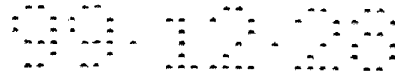
2、割草机在未发动或任一手柄不操作时，始终处于制动状态，避免其他人触及时出现非正常移动引起的危险，只有当按下下一个在位把手时，驱动轮制动才解脱。

3、当按下下一个在位把手，通过拉杆，驱动张紧轮转过一角度，驱动三角带仍处于松脱状态，割草机仍停止，这时可自由向前向后推拉割草机。若再按下刀子驱动手柄，刀子制动解脱，接上动力高速旋转，推前拉后可实现往复割草，这种功能便于割树冠下、树丛中或地形较复杂场合的草；

4、只要稍微改变一下两把手的方位就能实现轻松拐弯及原地转弯，当少许松开一些在位把手，就能实现无级减速，这一功能更有利于转大小不一的弯；

5、具备紧急制动功能，能防止意外，确保安全。当两在位把手松脱，则整个操作系统联动，完成切断刀子动力、制动刀子、制动驱动轮、停止行走等动作。

图 1 是本发明的一种结构示意图。



## 说明书

图 2 是本发明的传动轴的结构示意图。

下面结合附图对本发明作进一步描述。

结合图 1、图 2，本发明的联动操作随进式割草机，为一具有联动操作系统的三刀、双刀或单刀联动操作随进式割草机。

在位把手 1、5 铰接拉杆 50、47，铰接点在在位把手 1 或 5 按下时，将处于死点，以此减少操作力。拉杆 50、47 与左、右铰板 46、41 铰接，左、右铰板 46、41 空套在联动轴 42 上，左、右铰板 46、41 轴套上开有一槽，联动轴 42 上固联的圆柱销 60、59 嵌入左、右铰板 46、41 槽口，联动轴 42 两头固联制动曲柄 39，并在上面铰接制动拉杆 38，制动拉杆 38 制动摆板 37 铰接，制动摆板 37 还联接一拉簧 36，制动环 34 一端铰接制动摆板 37，另一端铰接在后支板 35 上，制动环 34 套在驱动轮 31 制动毂 32 上，构成联动制动系统。在位把手 1、5 铰接拉杆 50、47，拉杆 50、47 上有一支耳与联动杠杆 3 两端铰接，联动杠杆 3 两端有二个长槽，铰接螺钉 61 可在槽中滑移，以满足在位把手 1、5 按下时，拉杆 50、47 间的距离变化，联动杠杆 3 中间又与驱动拉杆 48 铰接，驱动拉杆 48 又与驱动张紧轮铰板 8 铰接，构成联动行走操作系统。联动轴 42 穿过机架 27 两翼，并可相对转动，联动轴 42 两边各销一只圆柱销 60、59，刚好嵌入左、右铰板 46、41 轴套的槽口中，左、右铰板 46、41 轴套槽宽与圆柱销间留有一定间隙，左、右铰板 46、41 相对联动轴 42 能旋转一个角度，使得左、右铰板 46、41 作任一个翻转时，都能联动制动曲柄 39，凸轮铰板 43。发动机 16 通过三角带 22 带动下层三角带 24 使刀子高速旋转，发动机 16 动力又通过主皮带轮 29 上层带轮，由三角带 14 传到变速箱 12，经变速带动驱动主动带轮 7，带动两根三角带 10，使驱动从动带轮 13 旋转，同时带动差速器 40 旋转，最后动力传递到两驱动轮 31，由此构成这一动力传动系统。在位把手 1、5 铰接，拉杆 50、47 又与左、右铰板 46、41 铰接，套在联动轴 42 上，凸轮 44 与凸轮铰板 43 固联，空套在联动轴 42 上，凸轮 44 上方又置一棘爪 45，构成刀子动力输入、切断联动装置。刀子驱动手柄 4 与拉杆 49 铰接，拉杆 49 又与凸轮铰板 43 铰接，凸轮铰板 43 另一端又与拉杆 26 铰接，拉杆 26 另一端铰接于摆板 19，摆板 19 上固接活张紧轮 21，左边又固接一制动块 20，摆板 19 上还联接一复位制动弹簧 17，由此组成刀子张紧及制动联动装置。后支板 35 一端与机架 27 铰接，另一端与轴承座 58 固联，轴承座 58 又与前支板 30 铰接，前支板 30 与铰接螺钉

99-10-28

## 说 明 书

---

28 铰接，铰接螺钉 28 能在机架 27 槽内移动，轴承座 58 支撑在差速器 40 外壳 55 上，轮轴 33 分别是从差速器 40 的外壳 55 中伸出，轮轴 33 上分别安装两驱动轮 31，由此构成割草机调高系统。

以上所有的零部件均采用金属加工，带轮由薄钢板冲压成形，拉杆由冷拉圆钢加工而成，联动杠杆 3、联动轴 42、棘爪 45、凸轮 44 由优质结构碳钢制造而成，弹簧采用弹簧钢。在位把手 1、5，刀子驱动手柄 4，左、右铰板 46、41，摆板 19、机架采用钢板冲压而成。



99.12.28

说明书附图

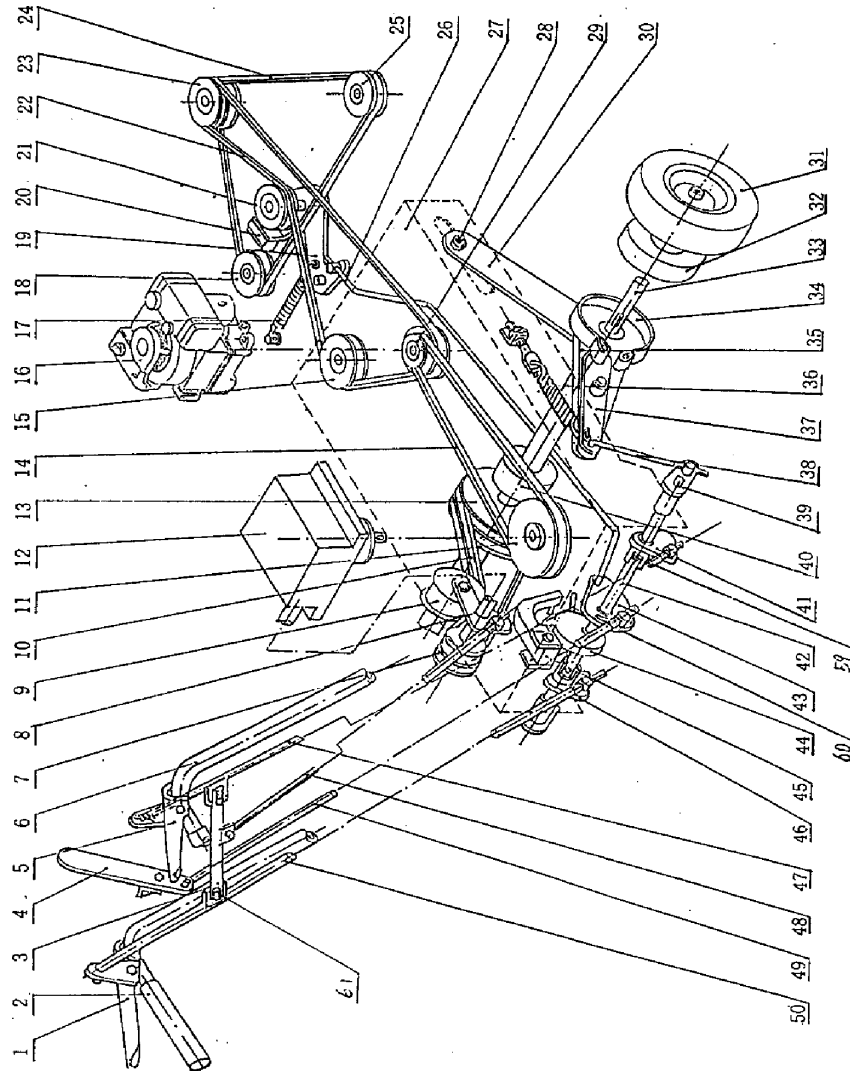


图 1

99-10-98

说明书附图

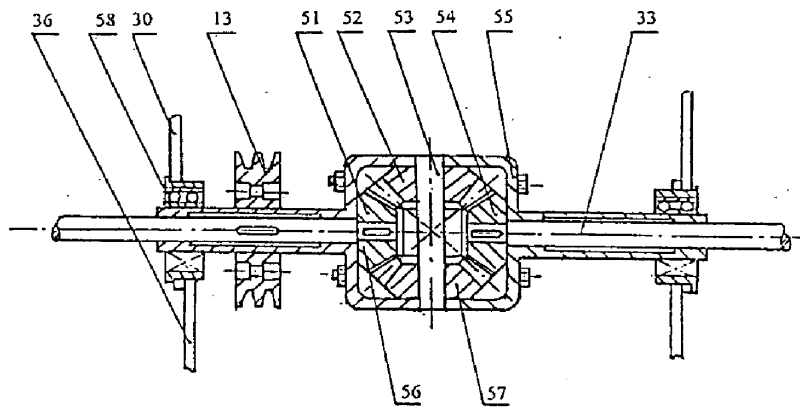


图 2

**English Abstract:**

The patent refers to the field of 'harvesting or mowing cereals or grass'. The grass-cutting machine includes machine frame, engine, driving system, control system and walking system, which is characterized by the design of universal driving shaft and control components such as the handle, etc. to implement gang control of driving, braking, walking, height-regulating and grass-cutting operation. As compared with existent technology it is simple in structure, convenient in operation, and possesses high safety and reliability.

**English Description:****TECHNICAL FIELD**

This invention involves a kind of meadowlands mechanical, in particular to a linkage operation follow-type mower.

**BACKGROUND ART**

Existing follow-type mower is generally divided into two types of commercial and household. Commercial computer large horse power, wide mowing width, grass cutting efficiency is high, but the operation is complex, bulky, difficult to move, poor safety, require full-time personnel to operate. And domestic lawnmowers light and dexterous, safety and reliability, however, horsepower small, short service life, the mowing width is small, grass cutting efficiency is low. Existing dish complex operation, and after the engine is shut off, the only when the operator handle button at a certain position, only the whole machine is in braking state, once the operator forgetting the buckle pinches hand, will be caused by non-normal shift or scarples the dangerous.

**DISCLOSURE**

The purpose of this invention is to provide a function with linkage operation, of simple structure, convenient operation, good safety linkage operation follow-type mower.

The aim of the invention is in the technical solution: a linkage operation follow-type mower, which comprises a frame, engine, transmission system, control system, is characterized in that the control system in place of the handle is hinged pull rod, is connected with the pull rod and the left and right, left, right the articulation board is spatial sleeve on the linkage shaft, left, right die is provided with a notch on the shaft, the linkage shaft is fixedly connected to the cylindrical pin is embedded into the left, the notch of the right die, linkage shaft brake fixedly connected to the two ends of the crank, the crank is hinged brake pull rod brake, the brake brake pull rod is hinged swinging plate, also is connected with a tension

spring brake swinging plate, brake ring brake swinging plate is hinged with one end, the other end is hinged on the rear support plate, brake ring sleeve on the driving wheel brake hub; linkage shaft is also hollow sleeve a cam die head, cam articulation board solid association and on the framework above the cam of the one pawl is hinged, interlocking linkage between the two, is also the drilling of the cam 26 and a pull rod 49, a pull rod 49 is hinged a knife drive handle, the pull rod 26 hinged swing plate, a system linkage operation; bit handle is hinged pull rod 50, 47, pull rod 50, 47 is provided with a supporting ear and linkage lever 3 is hinged to the two ends of the, linkage lever 3 is provided with two elongated slot end, hinged screw 61 can slide in the slot. Linkage lever 3 and in the middle driving pull rod 48 is hinged, with driving stretching pulley articulation board driving pull rod 8 hinged, constitute linkage running operating system; the linkage axis 42 passes through the frame 27 of the two-wing, and can relatively rotate, two sides of the linkage shaft is provided with a cylindrical pin 59, 60, embedding the left, the right hinge plate 46, 41 in the notch of the shaft sleeve, the left, the right die width of the shaft is provided with a certain clearance the cylindrical toggle, left, right hinge plate 46, 41 relative to the linkage shaft 42 can rotate an angle. The left, right hinge plate 46, 41 any one when turning, can all linkage brake crank 39, the cam hinge plate 43. Gear box 12 drives the drive output side driving belt wheel 7, drives two triangular belt 10, the driving of the driven belt wheel 13 rotating, at the same time drives the differential rotation, the differential 40 shell 55 supported in the front and rear support plate 30, 35 is, the final power transmitted to the two driving wheel 31, formed by this wheel-drive system; the pull rod handle is hinged in 50, 47, pull rod 50, 47 and the left, right hinge plate 46, 41 is hinged, is sleeved on the linkage shaft 42 is, cam 44 and the cam hinge plate 43 fixedly connected, and the linkage shaft 42 is, cam 44 is also above a pawl 45, a power input of a, cut off the interlocking linkage device; a knife drive handle 4 and the pull rod 49 is hinged, rod 49 and connected with the cam 43 is hinged, the other end of the cam connected with the pull rod 26 is hinged, pull rod 26 on the other end is hinged with the swing plate 19, is fixedly connected on the upper movable tension wheel 21, and on the left side is connected with a brake block 20, is hinged with the frame in the middle, on the swinging plate is connected with a reset braking spring 17, so that knife tensioning and brake linkage device; rear support plate 35 is connected with the frame 27 is hinged, the other end is fixedly connected with the bearing seat, the bearing seat and the front support plate 30 is hinged, front support plate 30 with the hinge screw 28 is hinged, hinged screw 28 in the frame 27 for movement, the bearing seat 58 is supported on the differential 40 shell 55 is, the wheel shaft 33 are extending from the differential casing, axle 33 are respectively mounted on the two driving wheel 31, formed by this mower height adjustment system.

The principle of this invention is to: any one of the injectors when the, linkage shaft to rotate a certain angle, the pawl are put down, a hub brake-release, push the knife drive handle, the movable tension wheel 21 tensioning triangular belt 22, the engine drives the main belt pulley 29 transmit motive force to the blade shaft belt wheel 23 the upper layer, the lower belt, the belt wheel to drive the knife 18, 25 to rotate at high speed, into the mowing state; the other path is through the upper layer of the primary pulley, which is composed of a triangle with 14 drives the transmission input pulley 11 rotating, the variable-speed gearbox,

drives the driving belt pulley 7, the drive wheel 9 is still in a loose position, no to transmit the power, drives the driven belt pulley is in a static, only front and rear push-and-pull lawn mower, not self-walking, only when the other is under the handle of the hand, the lower hem driving tension, tensioning triangular belt 10, drive the driven belt wheel 13, through the differential, drive tire running. When the driving the driven belt wheel is rotated to drive the differential rotation of the two wheel axles being, at the same time drives an intermediate pin 53 around the shaft 33 to rotate, and then drives the planetary bevel gear 52, 57 for planetary motion finally the power distribution to the two side bevel gears 54, 56, the driving wheel axle 33, the driving wheel 31 linear forward or turning, the purpose of the differential is reasonable distribution of the power obtained, easily and freely turning. Two-wheel speed and drives the driven belt wheel 13 the relation between rotational  $n_1 = n_2 + n_3$ .  $n_1$ : driving the driven belt wheel 13 speed;  $n_2$ : rotational speed of the left driving wheel;  $n_3$ : the right driving wheel rotational speed. Mower whether forward, turning all meet this speed relational expression. In the above-mentioned working state, any loose handle in place, the driving tension band wheel 9 upper swing, cut off the power driving hub, mower stop automatically, re-loose another in the handle, the mower emergency braking (including a knife). The principle structure of the mower of this invention: the knife, cut-off, brake mainly through swing plate 19 to the left and right swing, swing plate 19 and the frame 27 is hinged, can freely swing, swing plate 19 is fixedly connected on the left side and the brake block 20, and on the right side is hinged a tie rod 26, rod 26 and connected with the cam 43 is hinged, cam hinge plate 43 and the cam 44 fixedly connected, cam 44 and a pawl 45 interlocking, cam hinge plate 43 and the other end of the pull rod 49 is hinged, rod 49 and the knife drive handle 4 is hinged, when pushing the handle, cam hinge plate 43 rotating an angle, the tension rod 26 the swing plate 19 a supine, swing through and 19 fixedly connected to live tension pulley 21 the triangular belt 22 tensioning, power is input, a high-speed rotation of the start. However, if at this time the driving handle loosening knife 4, cam 44 can not be locked, swing plate 19 in the spring 17 of the left under the action of the swing, the brake block 20 will check the knife with wheel 18, at this moment the power but also is cut off. Only by pressing one of the injectors 1 (or 5), the lifting pull rod 50 (or 47), make left articulation board 46 (or right articulation board 41) through an angle, left articulation board 46 and right articulation board 41 is provided with a open slot, the linkage axis 42 is provided with two cylindrical pin 59 is embedded in the groove, on the left, the right hinge plate 46, 41 through an angle, drives the linkage shaft 42 also turn an angle, the left cylindrical pin (of the long-extended end downwards) through an angle, the pawl 45 is lowered, and then push the knife drive handle 4 the cam 44 with the pawl 45 interlocking, triangular belt 22 to be tensioned, power input, a knife is in the cutting state of the high-speed rotation. When the injectors 1 and 5 release the, left, right hinge plate 46, 41 in the spring 36 (can also be on the left, the right hinge plate 46, 41 and on the other spring) under the action of, drives the linkage shaft 42 rotating in the opposite direction, the left-side long cylindrical pin 60 is lifted, the pawl 45 upward, releasing cam die head, swing plate 19 left swing, loose triangular belt 22, the belt wheel brake a knife 18, 23, 25. When the press any bit handle 1 (or 5) at the same time, in addition to down pawl 45 functions, because the left, the right hinge plate 46, 41 by a cylindrical pin 60, 59 of making the linkage shaft 42 over an angle, because the brake crank 39 and the linkage shaft 42 fixedly connected, also

rotate the same angle, and of the brake pull rod is hinged 38, drive brake swing plate 37 at an angle backwards, loose brake ring 34, the release of the driving wheel 31, into the self-running state. Loosen the injectors 1 or 5, the spring 36 of the brake under the action of suitable 37 turning forward, tightens the brake ring 34, at this time the driving wheel 31 to be braked.

Walking control of the pull rod by the injectors 50, 47 linkage lever 3, the driving pull rod 48, drive wheel 9 to achieve. When the any of the injectors 1 (or 5), pull rod 50 (or 47) rising, drives the linkage lever 3 in one end of the, linkage lever 3 is in the oblique position, at this time the intermediate driving pull rod 48 also rises a section of the stroke, the driving pull rod 48 the driving stretching pulley articulation board and 8 hinged, the strip an angle downward, in waiting to tensioning position, because at this time the driving wheel 31 brake is release, push-and-pull mower can realize back and forth freely. When the and then push the other one of the injectors 5 (or 1), another pull rod 47 (or 50) and the linkage lever 3 increased by full-stroke, the entire linkage lever 3 is in the horizontal position, linkage lever 48 rises again a section of the stroke, the driving stretching pulley articulation board 8 an angle downwards and turn, drive a triangular belt 10 to be tensioned, lawn mower into the automatic running state. If the required speed of the short-time change (such as turning), to a little bit a handle 1 (or 5), stepless deceleration can be achieved.

Syllable rhyming of human of this invention high mechanism, from the support plate 35, front support plate 30, the bearing bracket 58, articulated screw 28 composition. Rear support plate 35 and the frame 27 is hinged, can freely turn over, rear support plate 35 and at the other end is fixedly connected with the bearing seat, the bearing seat 58 and the front support plate 30 is hinged at the rear end, the front support plate 30 with the hinge at the front end of the screw 28 is hinged, hinged screw 28 can be in a frame 27 to move slot back and forth. When the mobile to the required position the hinged screw 28 twists dies , fixed front, rear support plate 30, 35, passing through the bearing seat 58 of the wheel shaft 33 is kept at a certain height, the adjustment of the height of the mower is completed, the cutting of various heights to the lawn.

Compared with the prior art, the present invention, the obvious advantages that: the advantages of simple structure, convenient operation, the safety is good, linkage operation the system can realize the following functions:

- 1, the power input and off of a knife, the knife the braking and release;
- 2, the braking and release the driving wheel;
- 3, front and rear push-and-pull movement of the mower and the function of the front and rear push-and-pull reciprocating mower;
- 4, realize stepless speed running speed;

5, achieving the emergency brake;

6, realizes pivot turning.

Realize the above-mentioned function has the following advantages:

1, when the engine, a handle are not operating, a knife for power division cut-off state, to ensure the security of the mowing process; when the normal mowing, an operator suddenly release the two in the handle, the knife drive handle locking-release, power cutting knife, the knife at the same time brake, the stop a few seconds, guarantee the operating personnel, and other personnel, there is no danger of the side of the mower;

2, a lawn mower engine or any handle is not operated, always is in braking state, prevent other people present the abnormal touch the danger caused by movement, only when the one of the injectors, only driving wheel brake release.

3, when the one of the injectors, through the pull rod, drive tensioning rotary a angle, driving a triangular belt is still in a loose state, lawn mower is still stopped, at this time can be freely forward to surround the lawn mower. If the driving handle and then push the knife, the knife brake-release, high-speed rotation of the upper power, forward unfavorable can realize reciprocating the mowing, this function is convenient for cutting crown lower, more complex trees occasions or in the grass terrain;

4, as long as a change of the position of the two handles can be easily realized in turning and turning, some of the injectors when the slightly loosened, can realize stepless deceleration, is more conducive to this function of transfer sizes;

5, with emergency brake function, an accident can be prevented from, to ensure security. When the two the loose and the, the entire operating system linkage, complete cut-off knife power, brake a knife, braking the driving wheel, and the like to stop walking.

Figure 1 is a a structure diagram of the invention.

Figure 2 is a structure diagram of a transmission shaft of the present invention.

#### MODE FOR INVENTION

In conjunction with the following further description of the present invention.

Combining Figure 1, Figure 2, the linkage of this invention operation follow-type mower, with linkage operating system for a three-blade, double-knife or single linkage operation follow-type mower.

Injectors 1, 5 hinged pull rod 50, 47, point-at injectors is 1 or 5 is pressed down, will be in

dead center, so as to reduce the operation force. Pull rod 50, 47 and the left, right hinge plate 46, 41 is hinged, left, right hinge plate 46, 41 with the linkage shaft 42 the upper, left, right hinge plate 46, 41 motor on the shaft sleeve, the linkage axis 42 is fixedly connected on the cylindrical pin 60, 59 embedded left, right hinge plate 46, 41 the notch, the linkage axis 42 is fixedly connected with the two ends of the brake crank 39, and in the top-hinged brake pull rod 38, the brake pull rod 38 brake swing plate 37 is hinged, brake swing plate 37 is also connected a tension spring 36, brake ring 34 is hinged with one end of the swing plate 37, the other end is hinged on the rear support plate 35 on, brake ring 34 is sleeved on the driving wheel 31 hub 32 is, constitute a linkage brake system. Injectors 1, 5 hinged pull rod 50, 47, pull rod 50, 47 is provided with a supporting ear and linkage lever 3 is hinged to the two ends of the, linkage lever 3 two ends with two elongated slots, hinged screw 61 can slide in the slot, in order to meet the injectors 1, 5 is pressed down, pull rod 50, 47 change the distance between the, linkage lever 3 and in the middle driving pull rod 48 is hinged, the driving pull rod 48 the driving stretching pulley articulation board and 8 hinged, constitute linkage running operating system. The linkage axis 42 passes through the frame 27 of the two-wing, and can be relative rotation, the linkage axis 42 only the two sides of a cylindrical pin of each pin 60, 59, is just embedded left, right hinge plate 46, 41 in the notch of the shaft sleeve, the left, right hinge plate 46, 41 with the cylindrical groove width of the shaft a certain clearance is left toggle, left, right hinge plate 46, 41 relative to the linkage shaft 42 can rotate an angle, so that the left, the right hinge plate 46, 41 for any one when turning, can all linkage brake crank 39, the cam hinge plate 43. Engine 16 through the triangular belt 22 drives the lower triangular belt 24 high-speed rotation of the knife, engine 16 power, but also through the main belt pulley 29 of the upper belt wheel, with the 14 to the gear box 12, the variable speed drive driving belt wheel 7, drives two triangular belt 10, the driving of the driven belt wheel 13 rotating, at the same time drives the differential 40 rotating, the final power transmitted to the two driving wheel 31, thereby such a power transmission system. Injectors 1, 5 is hinged, pull rod 50, 47 and the left, right hinge plate 46, 41 is hinged, is sleeved on the linkage shaft 42 is, cam 44 and the cam hinge plate 43 fixedly connected, with the linkage shaft 42 is, cam 44 is also above a pawl 45, a power input a knife, cutting off the linkage device. The knife drive handle 4 and the pull rod 49 is hinged, rod 49 and connected with the cam 43 is hinged, cam hinge plate 43 and the other end of the pull rod 26 is hinged, pull rod 26 is hinged to the swinging plate one end of the other 19, swing plate 19 which is fixed on a tension pulley 21, and on the left side is connected with a brake block 20, swing plate 19 is also is connected with a reset braking spring 17, so that knife tensioning and brake linkage device. Rear support plate 35 is connected with the frame 27 is hinged, the other end of the bearing seat 58 fixedly connected to, the bearing seat 58 and the front support plate 30 is hinged, front support plate 30 with the hinge screw 28 is hinged, hinged screw 28 in the frame 27 for movement, the bearing seat 58 is supported on the differential 40 shell 55 is, the wheel shaft 33 is separately from the differential 40 shell 55 extending in the, axle 33 are respectively mounted on the two driving wheel 31, formed by this mower height adjustment system.

The above all of the components are made of metal processing, belt wheel is composed of a thin steel plate stamping forming, and the pull rod to pull the round steel, linkage lever 3, the



linkage axis 42, the pawl 45, cam 44 by the quality structure made of carbon steel, spring adopts a spring steel. Injectors 1, 5, a knife drive handle 4, left, right hinge plate 46, 41, swing plate 19, formed by stamping a steel plate is used.

#### ENGLISH CLAIMS:

1, a linkage operating linkage operation follow-type mower, which comprises a frame [27], engine [16], transmission system, control system, the running system, is characterized in that the control system the handle in place of [1, 5] is [50, 47], pull rod [50, 47] the left and right hinge [46, 41] is hinged, left, right hinge plate [46, 41] in the linkage shaft of the air sleeve [42] the upper, left, right hinge [46, 41] motor on the shaft sleeve, the linkage axis [42] a cylindrical pin of [59, 60] embedded left, right hinge plate [46, 41] notch, the linkage axis [42] the two head fixedly connected to the brake crank [39], the brake crank [39] [hinged brake pull rod [38], brake pull rod [38] and the brake swing plate [37] is hinged, brake swing plate [37] is also connected a tension spring [36], brake ring [34] brake swinging plate is hinged with one end of [37], the other end is hinged on the rear support plate [35] on, brake ring [34] set of the driving [31] hub [32] the upper, constitute a linkage brake system.

2, linkage operation follow-type mower according to Claim 1, characterized in that the handle in place [1, 5] is [50, 47], pull rod [50, 47] is provided with a supporting ear and linkage lever [3] is hinged with the two ends of the, linkage lever [3] there are two elongated slot end, hinged screw [61] can slide in the slot. Linkage lever [3] the driving pull rod intermediate and [48] is hinged, the driving pull rod [48] the driving stretching pulley articulation board and [8] are hinged, constitute linkage running operating system.

3, linkage operation follow-type mower as in Claim 1 or Claim 2, characterized in that the linkage axis [42] passes through the frame [27] the two wing, and can be relative rotation, the linkage axis [42] the two sides of the cylindrical pin only a [59, 60], embedding the left, the right hinge plate [46, 41] in the notch of the shaft sleeve, the left, right hinge plate [46, 41] shaft sleeve groove width and cylindrical toggle a certain clearance is left, left, right hinge plate [46, 41] relative to the linkage shaft [42] can rotate an angle. The left, right hinge plate [46, 41] any one when turning, can all linkage brake crank [39], the cam hinge plate [43].

4, linkage operation follow-type mower as in Claim 1 or Claim 2, characterized in that the gearbox [12] unilateral output drives the driving belt wheel [7], drives the two triangular with [10], the driving of the driven belt wheel [13] rotating, at the same time drives the differential [40] rotary, differential [40] of the housing [55] supporting the front and the rear support plate [30], [35] the upper, final power transmitted to the two driving wheels [31], formed by this wheel drive system.

5, linkage operation follow-type mower as in Claim 1 or Claim 4, characterized in that the handle in place [1, 5] is [50, 47], pull rod [50, 47] the left, the right hinge [46, 41] is hinged, is sleeved on the linkage shaft [42] the upper, cam [44] with the cam die head [43] fixedly connected to, the linkage shaft and air sleeve [42] the upper, cam [44] and above the pawl a [45], a power input of

a, cut off the interlocking linkage device.

6, linkage operation follow-type mower as in Claim 1 or Claim 5, characterized in that the knife drive handle [4] and the pull rod [49] is hinged, pull rod [49] the cam die and [43] is hinged, cam die head [43] with the pull rod one end [26] is hinged, pull rod [26] is hinged to swing the other end of the [19], swing plate [19] is fixedly connected with the movable tension wheel [21], is connected with a brake block, and the left side of the [20], intermediate hinged with a machine frame, swing plate [19] is also is connected with a reset braking spring [17], so that knife tensioning and brake linkage device.

7, linkage operation follow-type mower as in Claim 1 or Claim 6, characterized in that rear support plate [35] is connected with the frame [27] is hinged, the other end is fixedly connected with the bearing seat, the bearing seat and the front support plate [30] is hinged, front support plate [30] and the hinge screw [28] is hinged, hinged screw [28] a [27] groove mobile, bearing seat [58] supporting the differential [40] the housing [55] the upper, shaft [33] is separately from the differential [40] of the housing [55] out, wheel [33] are respectively installed on two drive wheel [31], increase the mower formed by this system.



## (12) 发明专利申请

(10) 申请公布号 CN 101897261 A

(43) 申请公布日 2010. 12. 01

(21) 申请号 201010169476. X

(22) 申请日 2010. 04. 27

(71) 申请人 宁波大叶园林设备有限公司

地址 315400 浙江省余姚市阳明东路 518 号

(72) 发明人 苏克

(51) Int. Cl.

A01D 75/00(2006. 01)

F01N 1/10(2006. 01)

F01N 13/00(2010. 01)

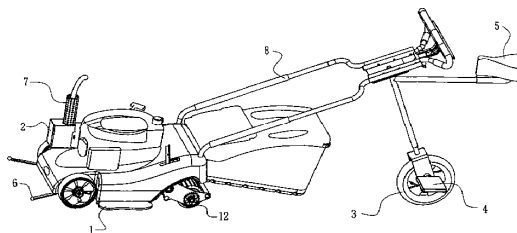
权利要求书 1 页 说明书 7 页 附图 11 页

### (54) 发明名称

环保型（带假脚防护和消声槽）推骑两用割草机

### (57) 摘要

本发明涉及一种用于庭院、公园及道路旁边等场所修剪草坪的草坪割草机，特别是一种环保型（带假脚防护和消声槽）推骑两用割草机。主要改进是草坪割草机前部设有含倒钩齿的进草杆；割草机中部两侧设有含转动铰链的假脚防护板；割草机后部设有含脚踏的推骑两用轮；特别是加设有消声槽（含消声管和水槽）；用水代配重，降低运输成本；用脚踏协助自走，省油及锻炼身体；加消声管，使减噪；加防护板，确保安全；还使压草对中；是综合效果有利于喂草，配重，降噪，降温，节能，环保，保墒和安全的草坪压草割草机。



1. 一种环保型（带假脚防护和消声槽）推骑两用割草机，由其前部设有的含倒钩齿的进草杆（6）；割草机中部两侧设有的含转动铰链的假脚防护板（1）；割草机后部设有的含脚踏的推骑两用轮的脚踏轮（3）和脚踏（4）及骑座（5）；以及消声槽的消声管（7）和水槽（2）及水槽（9），配重架（10）；扶手杆（8），操纵把手（14），（15），长杆螺栓（13）所组成。

2. 根据权利要求1所述的一种环保型（带假脚防护和消声槽）推骑两用割草机，其特征是：所述的进草杆（6）的杆体设有多个倒钩齿，及在杆头设有球体。

3. 根据权利要求1所述的一种环保型（带假脚防护和消声槽）推骑两用割草机，其特征是：所述的消声槽含有消声管（7）和水槽（2）及水槽（9）；及设有转动铰链（10a）的配重架（10）；所述的消声管（7）的下部弯管的下端与消声器出口相接；所述的水槽（2）的特征是，其侧面设有通孔（2c），其底部设有放水口（2d）。

4. 根据权利要求1所述的一种环保型（带假脚防护和消声槽）推骑两用割草机，其特征是：所述的消声管（7）由多段内管（7a）及连接片和含微孔的多个尖劈（7b）的外管组成；且所述的内管（7a）的特征是其上设有蜂巢式的六角形孔眼；且多段的内管长度是长短不同且相间的；例如有一段是四分之三波长（乘系数）的较长的内管，则相邻的是仅其四分之一波长（乘系数）的内管；另外，所述的内管（7a）上设有的多个孔眼的分布不是均布的而是有疏密的；特别是位于四分之三波长（乘系数）的一段管上的中部的四分之一管长的部位是较密的孔眼，其余的部分的管上是较疏的孔眼；且其孔眼的特征是六角形孔眼或多棱形的；所述的带孔眼的四分之一波长（乘系数）的内管的特征是其上设有的多个孔眼的分布不是均布的而是有疏密的；特别是位于该段管上的中部的八分之三管长的部位是较密的孔眼，其余的部分的管上是较疏的孔眼；所述的孔眼是多边形的特别是六角形的；作为改进，或者其孔眼的特征是多棱形的，特别是六棱形的，即有点扳金翻边的多边形的；或者其孔眼的特征是所述的有微孔的尖劈（7b）；所述的外管（7b）的面上，设有许多凸起，呈多棱锥状即多面锥体状，特别是六棱锥状，称为尖劈（7b）；所述的尖劈的特征是，其根部是六角形，从根到顶是缩小的；所述的六棱锥状的尖劈的顶部设有微孔，其直径在0.1至0.5毫米；在消声管内填充有多种吸声材料。

5. 根据权利要求1所述的一种环保型（带假脚防护和消声槽）推骑两用割草机，其特征是：所述的割草机中部两侧设有含转动铰链的假脚防护板（1），由防护板（1a）和转动铰链（1b）所组成；所述的防护板外形最好是象形的足形的即有两头略大的波浪形；或所述的防护板是用邵氏硬度在65到95的材料制成。

6. 根据权利要求1所述的一种环保型（带假脚防护和消声槽）推骑两用割草机，其特征是：所述的割草机后部设有含脚踏的推骑两用轮，是由可伸缩的扶手杆（8），脚踏轮（3），脚踏（4），骑座（5）以及可拆卸和可转动的支架所组成，其特征是，所述的脚踏轮（3）的每边各有一个脚踏，以及可拆卸和可转动的支架均可调节长短，主要是用大管内套小管的伸缩管的办法来调节的；所述的左右不太晃的操纵把手，由通过上扶手上的安装孔位的长杆螺栓（13）；穿过螺栓（13）的有轴套的自走操纵把手，及穿过螺栓（13）的有轴套的起动操纵把手所组成，所述的2个操纵把手的共同特征是均有与长杆螺栓（13）的杆径相配的且配合间隙不大的轴套；且上扶手向上弯达与扶手杆85度的夹角；所述的压草轮（12），其安装位置是沿割草机的中轴线而对称的；且所述的压草轮的长度大于两前轮的内间距；及跳高拉杆内置；集草箱的底部的特征是倒斜的即口部下沿高而箱体的后部的底面低。

## 环保型（带假脚防护和消声槽）推骑两用割草机

### 技术领域

[0001] 本发明涉及一种用于庭院、公园及道路旁边等场所修剪草坪的草坪割草机，主要改进是草坪割草机前部设有含倒钩齿的进草杆；割草机中部两侧设有含转动铰链的假脚防护板；割草机后部设有含脚踏的推骑两用轮；特别是加设有消声槽（含消声管和水槽）；综合效果有利于喂草，配重，降噪，降温，节能，环保，保墒和安全的草坪压草割草机。

### 背景技术

[0002] 草坪割草机被广泛用于按人们的喜好所选择的方式来割草。有些操作步行者喜欢和习惯用割草机时，在后半部的上扶手上使稍大的劲和有一种依靠和下压的感觉，这就无形中增加了前轮的翘起悬空的可能；而割草机的设计亦应尽可能照顾使用者的舒适和方便。使用汽油发动机的割草机前翘还少一些，因发动机较重。但也有前翘特别是左前轮前翘的不良现象发生。对于电动割草机而言，由于电动机比发动机轻，而电动机中轴要带动回转直径很大的割草刀，又不能太靠前安装，因此电动割草机的前轮翘抬现象更为常见。再说，按照有关标准例如 GB4706.78-2005；IEC60335-2-77-2002；EN836-1997 等标准，特别是 EN836/A3-2004/4.2.3.2.1～4.2.3.2.3.3，均有斜坡 16.7 度的规范要求。在整机前部加配重沙壶，安装要改底盘，要加三孔位，还要加沙石，较麻烦。配重因较重，运输成本也较高。

[0003] 另外，实践中割草时，由于割草机前部较窄，难以预知割幅，所以重复割和漏割即漏掉一长条草没割的现象常有发生，还得去补割。另外，割草机前部的两边侧的草，亦有被前轮压倒而没割到的。

[0004] 消声器被广泛作为内燃机特别是小型汽油发动机的消声设备，安装在汽缸盖上排气门口，来降低发动机运行过程的噪音。世界各国对各种行走车辆以及割草机的噪声的极限值都有相关的规定，排气消声器就是这样一个为减小排气噪音而生的装置。消声器的性能评价主要有声学性能，空气动力性能及结构性能等指标。内燃机的相当部分属脉动性低频噪声源，多采用抗性或阻抗复和性及微孔板消声器。常见的内燃机的消声器尤其是用于小型汽油发动机的消声器多是三腔式消声器，消声作用有限；且外部须有较大的防护外罩，但其本身却没有消声作用。再则，其外壳温升较高，发烫，影响安全。

[0005] 假脚防护在标准 STD.BSI EN 836-ENGL 1997 及 GB 4706.78-2005/IEC 60335-2-77；2002 均有相关要求。多数割草机的割草高度是有多挡可调的，这对操作步行者的脚的安全须按严格控制的安全规定。这通常是做假脚测试的。但假脚测试每天须测试测位较多，复盖产品数量太少。以至于有已经出货的割草机，个别被人测出假脚安规不过，则全部影响割草机定单。改进的想法往往是让割草刀抬高于底盘几毫米。但是由于割刀是细长条的局部弯折过的薄钢板，由于公差，形位公差及装配累计误差的原因，两端的刀尖在大批实际生产中就很难保证不高不低在一个圆周平面上；万一发生的事难避免，但也要确保万台无一出安全问题。

[0006] 草坪割草机被广泛用于按人们的喜好所选择的方式来割草，有些操作步行者喜欢和习惯用不但能割草，而且能按割草幅宽可以碾压草坪的割草机。这种割草机没有通常的

两个后大轮,后部只有很宽的压草轮。压草的主要好处一是为了草根保墒,二是为了追求独特的艺术效果。但是,常见的草坪割草机能调高,能自走,能割草,就是不能宽幅压草;而现有的有压草轮的割草机,所存在的问题是压草轮因变速箱及链条原故而单边偏置;以致于有一边的压草轮与前轮的压草轨迹就留下了一条长长的本应压草而未压到草的印记。

[0007] 草坪割草机被广泛用于按人们的喜好所选择的方式来割草,有些操作步行者喜欢和习惯用有自走的草坪割草机。但上扶手上的起动操纵把手和自走操纵把手,由于是用多弯的铁丝插入上扶手两侧的铁管的冲制的洞里,间隙大,致使操纵把手或左或右歪斜。

[0008] 有自走的草坪割草机的自走功能是通过发动机驱动皮带和变速箱及自走轮来实现的。自走时一方面消耗较多的功率,另一方面步行操作者还得步行跟进。如果改为骑行,就不但能省点油,还能锻炼身体,同时还能加强压草保墒的效果。

### 发明内容

[0009] 本发明提供一种草坪割草机,其前部设有含倒钩齿的进草杆;割草机中部两侧设有含转动铰链的假脚防护板;割草机后部设有含脚踏的推骑两用轮;特别是加设有消声槽(含消声管和水槽)及活动支架;左右不太晃的操纵把手;综合效果有利于喂草,配重,降噪,降温,节能,环保和安全,保墒的草坪割草机。

[0010] 本发明解决其技术问题所采取的技术方案是:

[0011] 草坪割草机前部设有含倒钩齿的进草杆(6);是由设在割草机前部的喂草口的两侧的进草杆及杆头的球体,杆体的多个倒钩齿所组成;所述的球体的距离等于割草宽度;其特征是所述的进草杆的杆体设有多个倒钩齿,及在杆头设有球体。草坪割草机前部设有有倒钩齿的进草杆,有利于两侧搂草喂入;而杆头的球体有按割草宽幅行进的指示作用,及有象征性的甲甲虫触角似的装饰作用。

[0012] 本发明提供的一种消声槽,含有消声管(7)和水槽(2);作为引伸,该水槽或者连接或者扩大,不妨称之为水槽(9);所述的消声管(7)的下部弯管浸入所述的水槽(2)和,或水槽(9)中,以便有降温作用。所述的水槽的作用是一举两得,除冷却外,还以水代重物;因其设在割草机前部,故有配重作用。另外,为方便放置配重,该配重或是水槽,或是另外的水桶或重物,水是临用时才加的,因这些不计运输重量,在割草机前部设有转动铰链(10a)的配重架(10)。铰链的作用是便于运输时收起,总的是为了减少运输成本。所述的消声管(7)的下部弯管的下端与消声器出口相接。所述的水槽(2)的特征是,其侧面设有通孔(2c)以便与所述的消声管(7)的下部弯管相配;其底部设有放水口(2d)。所述的配重架(10)的特征是设有转动铰链(10a);且其有弯折的五段条,中段可作把手用。所述的消声管(7)由多段内管(7a)及连接片和含微孔的多个尖劈(7b)阵列的外管组成。所述的内管(7a)的特征是其上设有蜂巢式的六角形孔眼;且多段的内管长度是长短不同且相间的;例如有一段是四分之三波长(乘系数)的较长的内管,则相邻的是仅其四分之一波长(乘系数)的内管。另外,所述的内管(7a)上设有的多个孔眼的分布不是均布的而是有疏密的;特别是位于四分之三波长(乘系数)的一段管上的中部的四分之一管长的部位是较密的孔眼,其余的部分的管上是较疏的孔眼;且其孔眼的特征是六角形孔眼或多棱形的;所述的带孔眼的四分之一波长(乘系数)的内管的特征是其上设有的多个孔眼的分布不是均布的而是有疏密的;特别是位于该段管上的中部的八分之三管长的部位是较密的孔眼,其余的部分的管

上是较疏的孔眼。所述的孔眼是多边形的特别是六角形的 ;作为改进,或者其孔眼的特征是多棱形的,特别是六棱形的,即有点扳金翻边的多边形的 ;或者其孔眼的特征是所述的有微孔的尖劈 (7b)。具有四分之一波长效果和疏密波效应及蜂巢效应。所述的外管 (7b) 的面上,设有许多冲压成形的凸起,呈多棱锥状即多面锥体状,特别是六棱锥状,称为尖劈 (7b) ;所述的尖劈的特征是,其从金属板的冲压的根部是六角形,从根到顶是缩小的,大致其宽深比为一比一,或至一比一点五。并且在所述的消声管的面上的每个所述的六棱锥状的尖劈的顶部设有微孔,其大致直径在 0.1 至 0.5 毫米为宜。在所述的内管 (7a) 的面上,作为改进,或者其孔眼也可改设为有许多冲压成形的凸起,呈多棱锥状即多面锥体状,特别是六棱锥状,也可称为尖劈,但其宽深比为一比零点八,或至一点四比一。诸多尖劈组成尖劈多楞结构,其在各个面的排列是蜂巢形的六角多边形的,或是随机的。在消声管内或可半填充有金属纤维或耐高温的非金属材料 ;或可半填充有耐中温的吸音材料特别是多孔吸声材料或柔性材料及膜状材料。所述的多孔材料如纤维类,泡沫类,颗粒类,单用也行,或多或少混合应用也行。还可纤维类如岩棉,或玻璃丝,或玻璃棉特别是超细玻璃棉 ;或用泡沫类要防火的 ;或用颗粒类如膨胀珍珠岩,多孔陶土砖,及耐温的织物,毡来填充或贴附 ;以利进一步改良性能指标,而综合组成能达到降噪效果较好的目的。多种材料有互补的高低频声吸收效能。诸多尖劈,加多了散热面积 ;特别是诸多有微孔的尖劈,不但有降噪的微孔效应,而且有排泄过多液体的潜在效能。作为引伸,诸多尖劈还可反拉伸即朝外以加多散热面积。在消声器和发动机之间还可装配既作隔热垫又作减震垫的垫片。在消声器的出口与所述的消声管 (7) 之间也可装配既作隔热垫又作减震垫的垫片。本发明提供的消声槽设有众多的大面积的尖劈区域,含众多的有微孔的尖劈,有尖劈阻降效果及微孔效果。本发明提供的消声槽造成的有益效果是 :增多消声效果及提升消声器的综合性能如插入损失,传声损失,减噪量及衰减量,以及降温。

**[0013]** 本发明提供一种草坪割草机,除过在其前部设有含倒钩齿的进草杆及所述的消声槽外,还在割草机中部两侧设有含转动铰链的假脚防护板 (1)。所述的在割草机中部两侧设有的含转动铰链的假脚防护板 (1) 由防护板 (1a) 和转动铰链 (1b) 所组成 ;其特征是所述的防护板是左,右各一的 ;但当有时要在右侧安放侧排草板时,就只在左边安放假脚防护板 ;所述的防护板外形最好是象形的足形的即有两头略大的波浪形,以增强足部要小心的警示联想和艺术形象 ;特别是所述的防护板最好是用较柔软但不太软的邵氏硬度在 65 到 95 材料例如橡胶 ,聚氨脂或聚氯乙烯来作主要板材,其有益之处是放水平来工作时柔板更不易伤草,而且橡胶板更便于装箱。所述的防护板也可用硬质的材料。所述的防护板边设有可活动的铰链,不限一根或多根或用柔性材料,再辅以适可而止的限定性的限位,只要能使用所述的防护板放水平来工作且转上去便于装箱就可以了。作为引伸或改进,所述的防护板也可设为可拆卸的,工作时放上,不工作时取下。为了防患于未然,预防为主,确保大量出货的整机全都能通过假脚检测,以弥补割草机现有的转割机构所致的两头刀尖高低不平的欠缺,特此提供本割草机用防假脚测试割刀高度的所述的防护板。

**[0014]** 本发明还提供推骑两用割草机,即在割草机后部设有含脚踏的推骑两用轮 ;附加设有消声槽 (含消声管和水槽) 和活动配重支架,以及假脚防护板 ;还改进了可伸缩的扶手杆 (8),及左右不太晃的操纵把手,以及左右对称的无漏留压印的对中的压草轮 ;故其综合效果有利于喂草,配重,降噪,降温,节能,环保和安全,保墒。

[0015] 所述的割草机后部设有含脚踏的推骑两用轮,是由可伸缩的扶手杆(8),脚踏轮(3),脚踏(4),骑座(5)以及可拆卸和可转动的支架所组成,其特征是,所述的脚踏轮(3)的左右每边各有一个象脚踏自行车样的脚踏;脚踏拐轴和脚踏轮的轴上或可设有单向轴承;所述的骑座(5)以及可拆卸和可转动的支架均可调节长短,主要是用大管内套小管的伸缩管的办法来调节的。所述的脚踏轮(3)还可参考不同的土壤而选择相适应的幅宽。

[0016] 所述的左右不太晃的操纵把手,由通过上扶手上的安装孔位的长杆螺栓(13);穿过螺栓(13)的有轴套的自走操纵把手,及穿过螺栓(13)的有轴套的起动操纵把手所组成,所述的2个操纵把手的共同特征是均有与长杆螺栓(13)的杆径相配的且配合间隙不大而使其左右不太晃的轴套;且上扶手向上弯达与扶手杆85度的夹角。

[0017] 所述的左右对称的无漏留压印的对中的压草轮(12)的特征是,其安装位置是沿割草机的中轴线而对称的;且所述的压草轮的长度大于两前轮的内间距。现在调整了齿轮箱及相关机构的位置,使之好不容易对中。齿轮箱改进为正弦波式结构;跳高拉杆内置。

[0018] 因为有了压草轮,出草口比较高,所以本发明的割草机的集草箱的底部的特征是倒斜的即口部下沿高而箱体的后部的底面低以便留草。

#### 附图说明

[0019] 下面结合附图和实施例对本发明进一步说明。

[0020] 图1是本发明的推骑两用割草机整机的示意图。

[0021] 图2是防护板的示意图。

[0022] 图3是消声管的外管的一圈的尖劈的立体示意图。

[0023] 图4是消声管和水槽的示意图。

[0024] 图5是水槽的示意图。

[0025] 图6是消声管的内管的示意图。

[0026] 图7是脚踏轮(3)和脚踏(4)的示意图。

[0027] 图8是本发明的推骑两用割草机整机的去除骑只用推的示意图。

[0028] 图9是消声管和大水槽(9)的割草机前部的示意图。

[0029]

[0030]

[0031]

[0032]

[0033]

[0034]

[0035]

[0036]

[0037] 图10是尖劈的剖面图。

[0038] 图11是割草机底部的仰视示意图。

[0039] 图12是割草机前部的前视示意图。

[0040] 图13是配重架的示意图。

[0041] 图14是压草轮的示意图。



- [0042] 图 15 是长杆螺栓的示意图。
- [0043] 图 16 是自走操纵把手的示意图。
- [0044] 图 17 是起动操纵把手的示意图。
- [0045] 如图 1 到图 17 所示,图中:
- [0046] 1. 是假脚防护板;
- [0047] 1a. 是防护板;
- [0048] 1b. 是防护板的转动铰链;
- [0049] 2. 是水槽;
- [0050] 2c. 是水槽的通孔;
- [0051] 2d. 是水槽的放水口;
- [0052] 3. 是脚踏轮;
- [0053] 4. 是脚踏;
- [0054] 5. 是骑座;
- [0055] 6. 是进草杆;
- [0056] 7. 是消声管;
- [0057] 7a. 是消声管的内管;
- [0058] 7b. 是尖劈;
- [0059] 8. 是扶手杆;
- [0060] 9. 是水槽;
- [0061] 10. 是配重架;
- [0062] 10a. 是配重架的转动铰链;
- [0063] 11. 是前轮;
- [0064] 12. 是压草轮;
- [0065] 13. 是长杆螺栓;
- [0066] 14. 是自走操纵把手;
- [0067] 15. 是起动操纵把手。

### 具体实施方式

[0068] 草坪割草机被广泛用于按人们的喜好所选择的方式来割草。有些操作步行者喜欢和习惯推割草机;而有些操作者可选择骑方式来割草。均可用本发明所涉及的一种用于庭院、公园及道路旁边等场所修剪草坪的草坪割草机,即环保型(带假脚防护和消声槽)推骑两用割草机,其主要改进是草坪割草机前部设有含倒钩齿的进草杆;割草机中部两侧设有含转动铰链的假脚防护板;割草机后部设有含脚踏的推骑两用轮;特别是加设有消声槽(含消声管和水槽);综合效果有利于喂草,配重,降噪,降温,节能,环保,保墒和安全的草坪压草割草机。

[0069] 原来割草时,由于割草机前部较窄,难以预知割幅,所以重复割和漏割即漏掉一长条草没割的现象常有发生,还得去补割。另外,割草机前部的两边侧的草,亦有被前轮压倒而没割到的,有了含倒钩齿的进草杆就改良了现况。由于草坪割草机前部设有含倒钩齿的进草杆(6);是由设在割草机前部的喂草口的两侧的进草杆及杆头的球体,杆体的多个倒

钩齿所组成;所述的球体的距离等于割草宽度;其特征是所述的进草杆的杆体设有多个倒钩齿,及在杆头设有球体,故草坪割草机前部设有的有倒钩齿的进草杆,有利于两侧搂草喂入;而杆头的球体有按割草宽幅行进的指示作用,及有象征性的甲甲虫触角似的装饰作用。当装箱时,可收起杆(6)。

[0070] 先装好配重架(10)和水槽(9),一定要加半槽的清水,再开机。因为本发明提供一种消声槽,含有消声管(7)和水槽(2);作为引伸,该水槽或者连接或者扩大,不妨称之为水槽(9);检查所述的消声管(7)的下部弯管浸入所述的水槽(2)和,或水槽(9)中,以便有降温作用。所述的水槽的作用是一举两得,除冷却外,还以水代重物;因其设在割草机前部,故有配重作用。另外,为方便放置配重,该配重或是水槽,或是另外的水桶或重物,水是临用时才加的,因这些及水不计长途运输重量,在割草机前部设有转动绞链(10a)的配重架(10)。绞链的作用是便于运输时收起,总的是为了减少运输成本。所述的消声管(7)的下部弯管的下端与消声器出口相接。所述的水槽(2)的特征是,其侧面设有通孔(2c)以便与所述的消声管(7)的下部弯管相配;其底部设有放水口(2d)。所述的配重架(10)的特征是设有转动绞链(10a);且其有弯折的五段条,中段可作把手用。

[0071] 因为所述的消声管(7)由多段内管(7a)及连接片和含微孔的多个尖劈(7b)阵列的外管组成;又因为内燃机尤其是小型汽油机燃烧室内燃烧完成的,所以做功后的废气经排气门排出后,进入消声器内第一腔(1)膨胀后,根据降噪原理,其废气的频率因容积大小而降低。废气通过中腔上板和中腔下板的侧面通孔及屏板再一次降低频率后进入第二腔膨胀。降低频率后的废气通过中腔上板和中腔下板的侧面通孔再一次降低频率后进入第三腔,再一次膨胀,降低频率。然后,第三腔的废气通过消声器出口进入所述的消声管(7)的下部弯管的下端的带孔眼的内管(7a),膨胀后的废气从所述的内管(7a)的特征是其上设有蜂巢式的六角形孔眼进入外管;又因多段的内管长度是长短不同且相间的;例如有一段是四分之三波长(乘系数)的较长的内管,则相邻的是仅其四分之一波长(乘系数)的内管。另外,所述的内管(7a)上设有的多个孔眼的分布不是均布的而是有疏密的;特别是位于四分之三波长(乘系数)的一段管上的中部的四分之一管长的部位是较密的孔眼,其余的部分的管上是较疏的孔眼;且其孔眼的特征是六角形孔眼或多棱形的;所述的带孔眼的四分之一波长(乘系数)的内管的特征是其上设有的多个孔眼的分布不是均布的而是有疏密的;特别是位于该段管上的中部的八分之三管长的部位是较密的孔眼,其余的部分的管上是较疏的孔眼。所述的孔眼是多边形的特别是六角形的;作为改进,或者其孔眼的特征是多棱形的,特别是六棱形的,即有点钣金翻边的多边形的;或者其孔眼的特征是所述的有微孔的尖劈(7b),所以具有四分之一波长效果和疏密波效应及蜂巢效应。又由于在消声管内半填充,填充或贴附多种材料,所以膨胀后的废气几经周折,最后从消声管的上部的弯管排出。以利进一步改良性能指标,而综合组成能达到降噪效果较好的目的。多种材料有互补的高低频声吸收效能。诸多尖劈,加多了散热面积;特别是诸多有微孔的尖劈,不但有降噪的微孔效应,而且有排泄过多液体的潜在效能。本发明提供的消声槽设有众多的大面积的尖劈区域,含众多的有微孔的尖劈,有尖劈阻降效果及微孔效果。

[0072] 在割草机中部两侧装设含转动绞链的假脚防护板(1),当要工作时,使之大致处水平位置。因为所述的在割草机中部两侧设有的含转动绞链的假脚防护板(1)由防护板(1a)和转动绞链(1b)所组成;故防护板是左,右各一安装的;但当有时要在右侧安放侧排草板

时,就只在左边安放假脚防护板;因为所述的防护板外形最好是象形的足形的即有两头略大的波浪形,可增强足部要小心的警示联想和艺术装饰效果。特别是所述的防护板最好是用较柔软但不太软的邵氏硬度在 65 到 95 材料例如橡胶,聚氨脂或聚氯乙烯来作主要板材,其有益之处是放水平来工作时柔板更不易伤草,而且橡胶板更便于装箱。所述的防护板也可用硬质的材料。所述的防护板边设有可活动的铰链,不限一根或多根或用柔性材料,再辅以适可而止的限定性的限位,只要能使所述的防护板放水平来工作且转上去便于装箱就可以了。作为引伸或改进,所述的防护板也可设为可拆卸的,工作时放上,不工作时取下。为了防患于未然,预防为主,用此防假脚测试割刀高度的所述的防护板,可确保大量出货的整机全都能通过假脚检测,以弥补割草机现有的转割机构所致的两头刀尖高低不平的欠缺。

[0073] 本发明提供的推骑两用割草机,给操作者有两种选择。因为所述的割草机后部设有含脚踏的推骑两用轮,是由可伸缩的扶手杆(8),脚踏轮(3),脚踏(4),骑座((5)以及可拆卸和可转动的支架所组成,且主要是用大管内套小管的伸缩管的办法来调节的,所以,向下拔出,可取下骑的部分,使之成如图 8 所示的推的割草机。反之,装配上骑的部分,则为骑的割草机。又因为所述的脚踏轮(3)的左右每边各有一个象脚踏自行车样的脚踏;且脚踏拐轴和脚踏轮的轴上或可设有单向轴承;及所述的骑座(5)以及可拆卸和可转动的支架均可调节长短,主要是用大管内套小管的伸缩管的办法来调节的,方便骑乘。所述的脚踏轮(3)还可参考不同的土壤而选择相适应的幅宽。

[0074] 因为所述的改进了的操纵把手,由通过上扶手上的安装孔位的长杆螺栓(13);穿过螺栓(13)的有轴套的自走操纵把手,及穿过螺栓(13)的有轴套的起动操纵把手所组成,所述的 2 个操纵把手的共同特征是均有与长杆螺栓(13)的杆径相配的且配合间隙不大而使其左右不太晃的轴套,所以操纵把手左右不太晃了。

[0075] 因为采用所述的左右对称的无漏留压印的对中的压草轮(12),且其安装位置是沿割草机的中轴线而对称的;且所述的压草轮的长度大于两前轮的内间距。又因为现在调整了齿轮箱及相关机构的位置,使之好不容易对中;且齿轮箱的离合块也改进为正弦波式结构;以及使调高拉杆置于机体内,使更美观。

[0076] 因为有了压草轮,出草口比较高,所以本发明的割草机的集草箱的底部的特征是倒斜的即口部下沿高而箱体的后部的底面低以便留草。又因为有可伸缩的及下宽的扶手杆(8),使集草箱有取放空间;扶手杆(8)的上部的缩窄,及上扶手向上弯达与扶手杆 85 度的夹角增强了装饰性,且更方便操作。

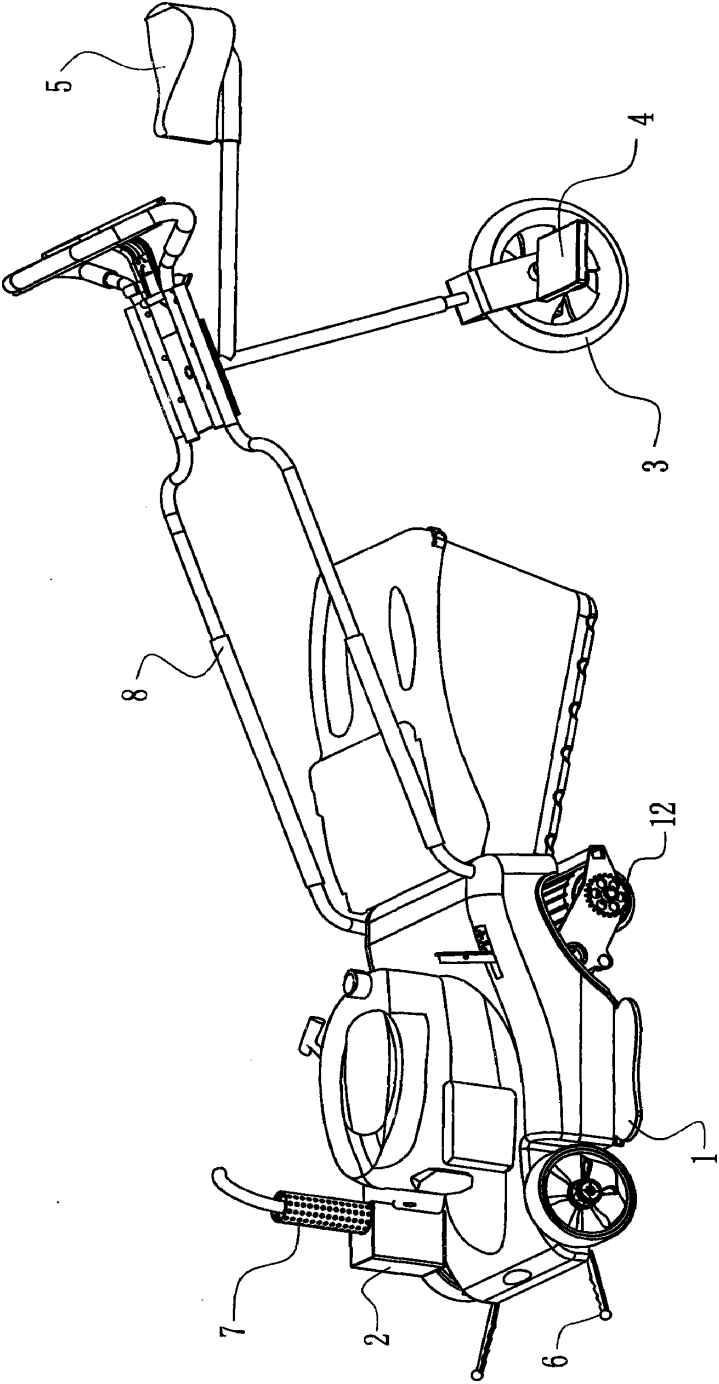


图 1

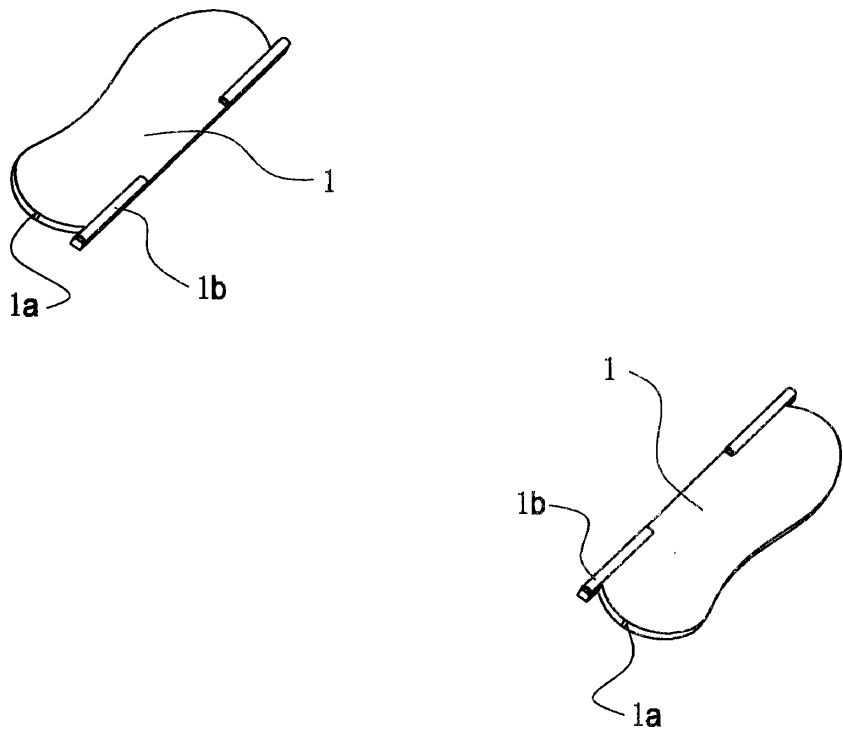


图 2

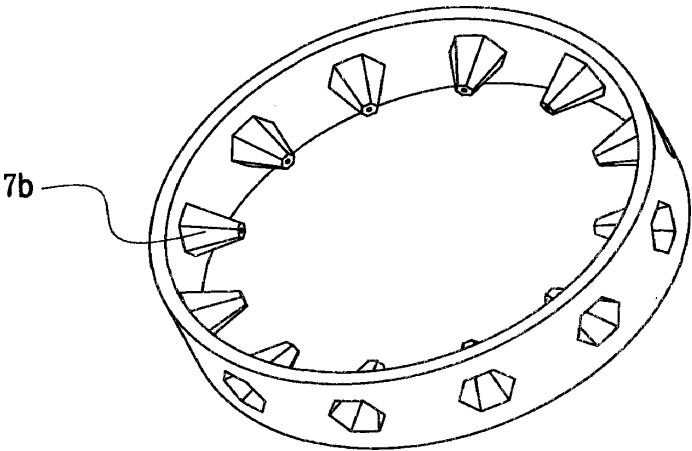


图 3

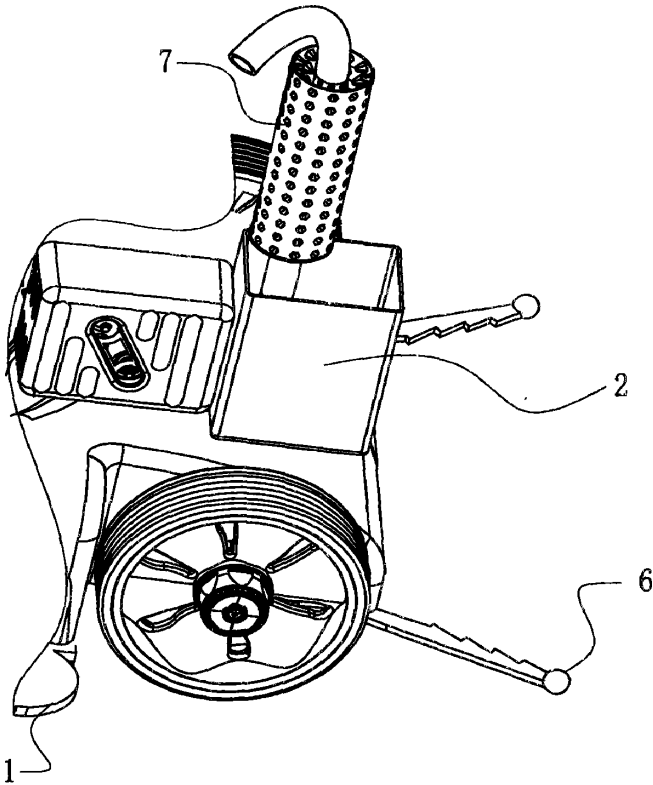


图 4

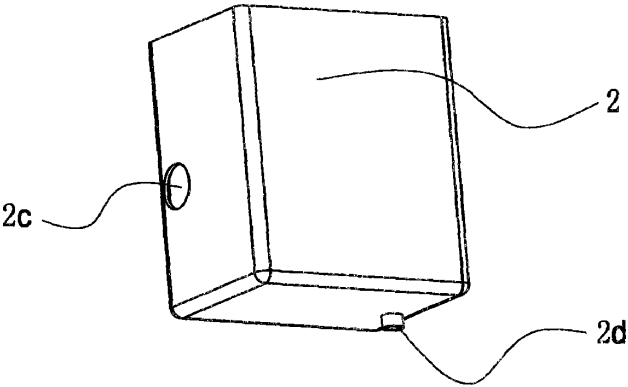


图 5

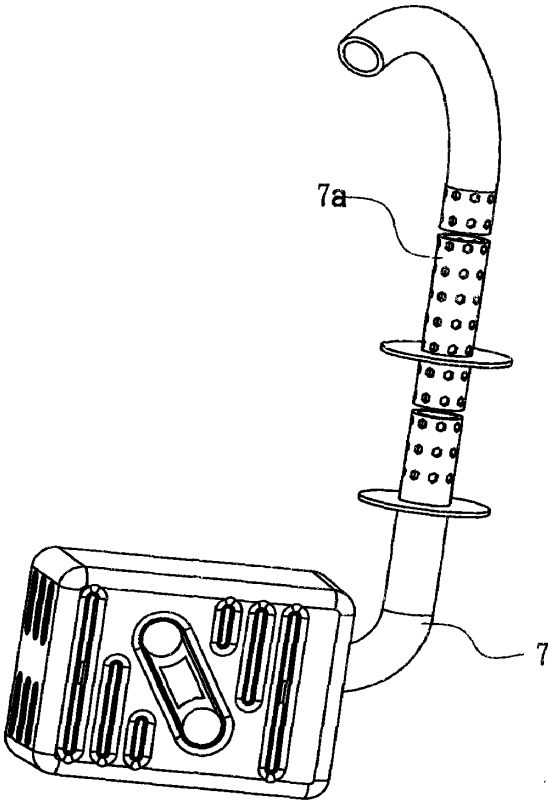


图 6

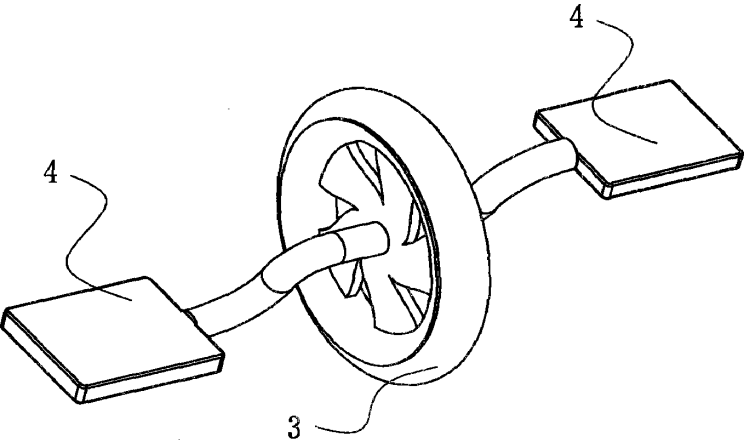


图 7

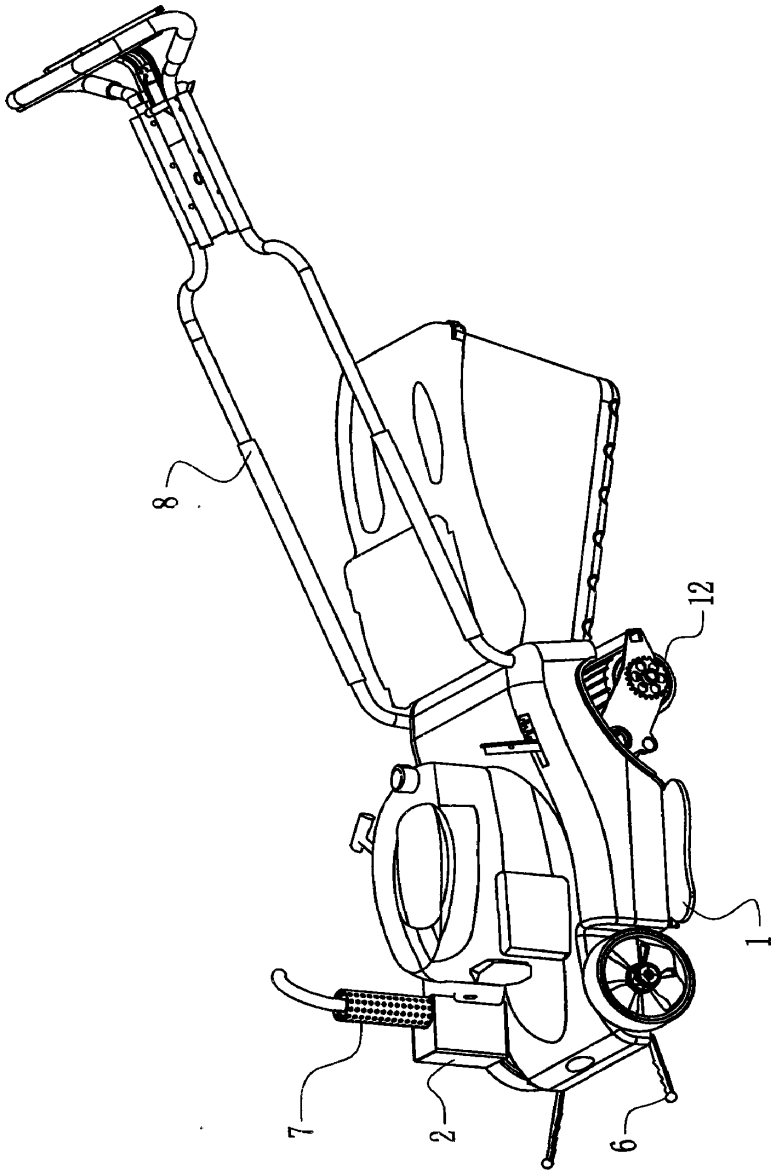


图 8



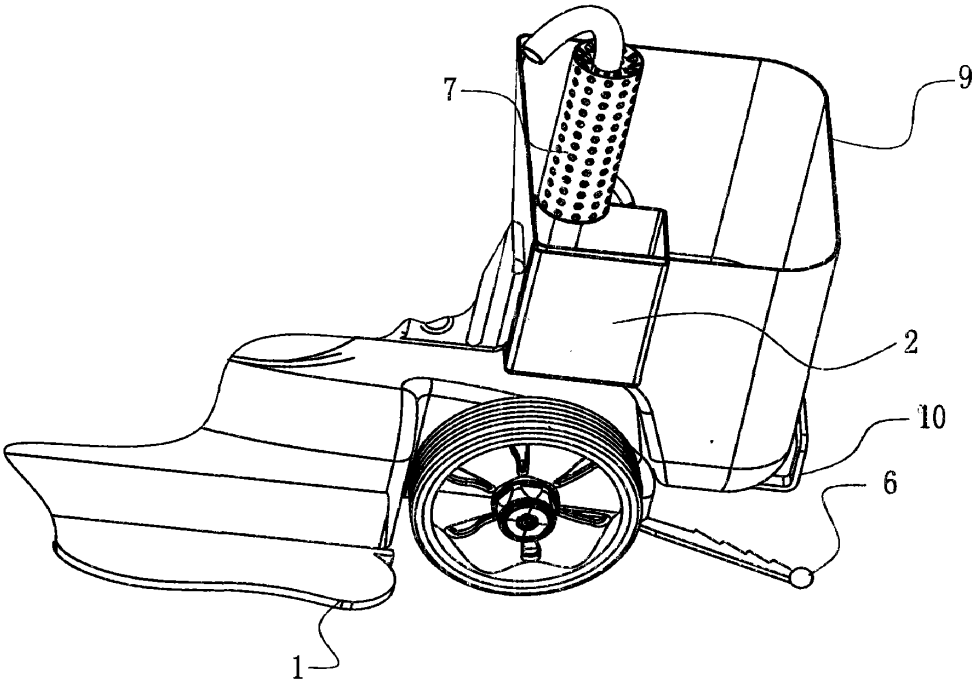


图 9

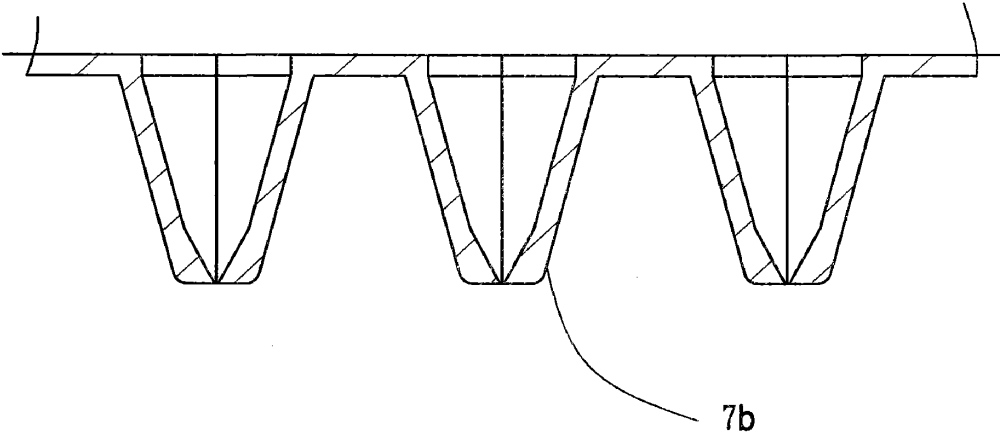


图 10

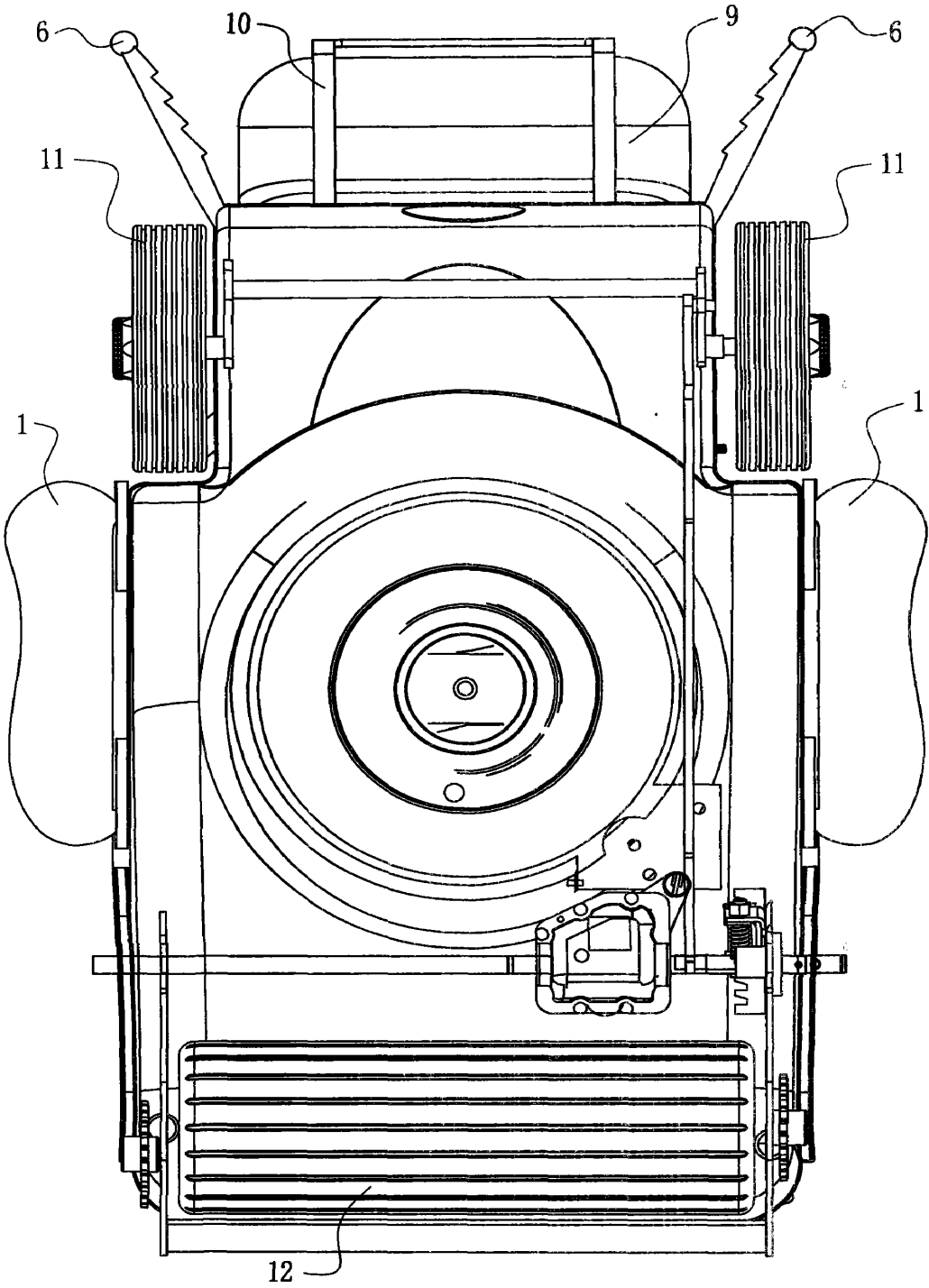


图 11

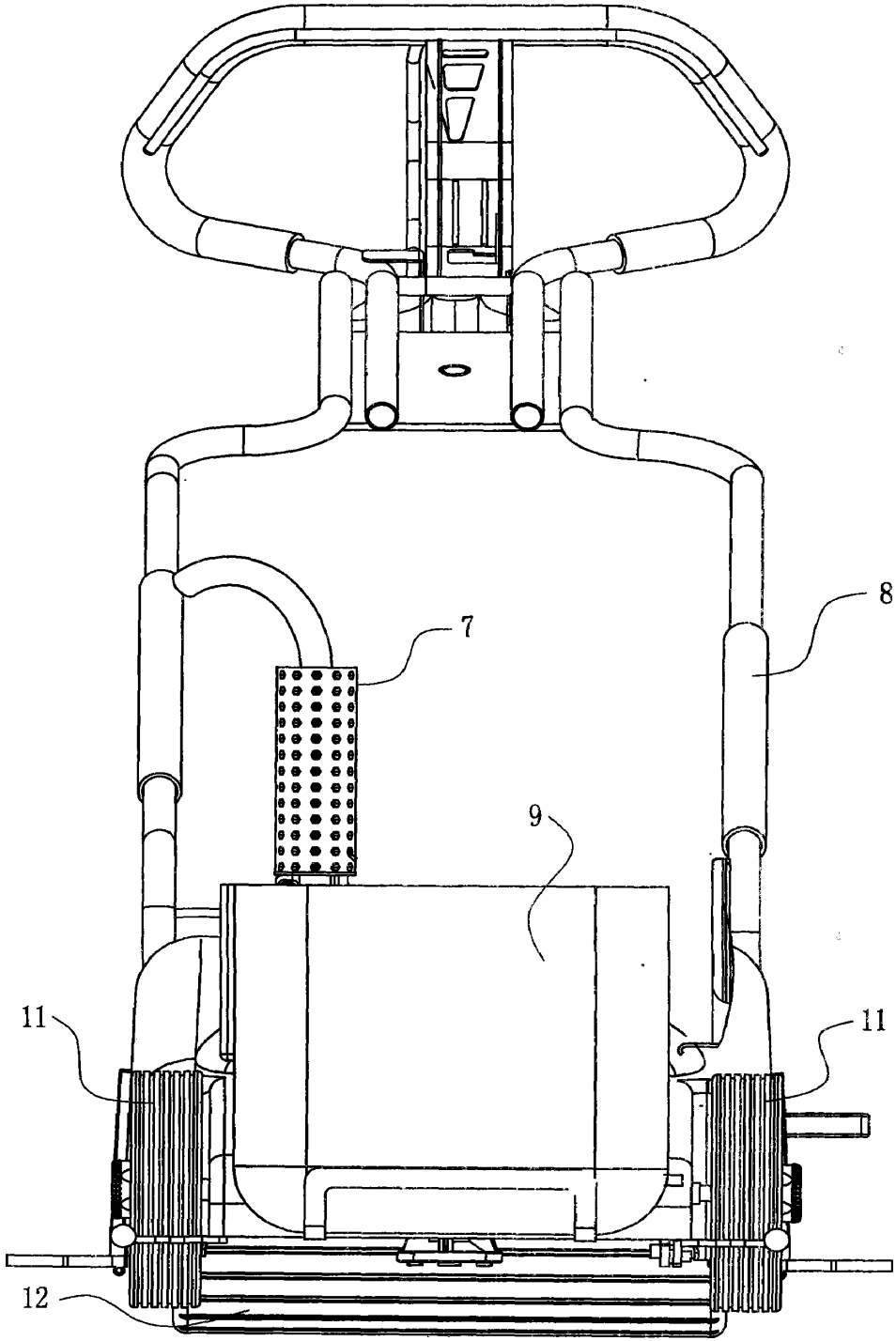


图 12

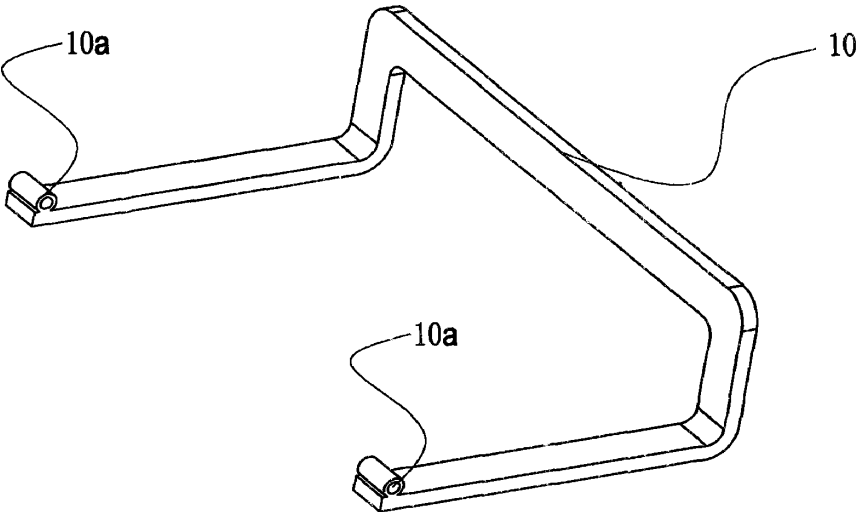


图 13

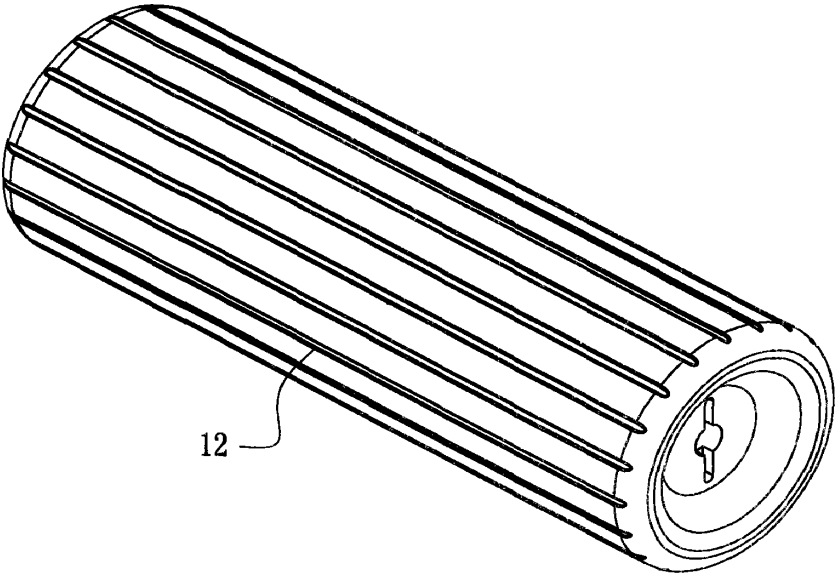


图 14

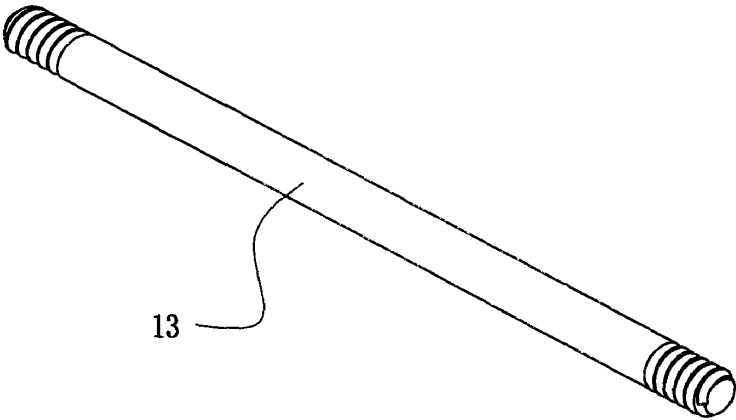


图 15

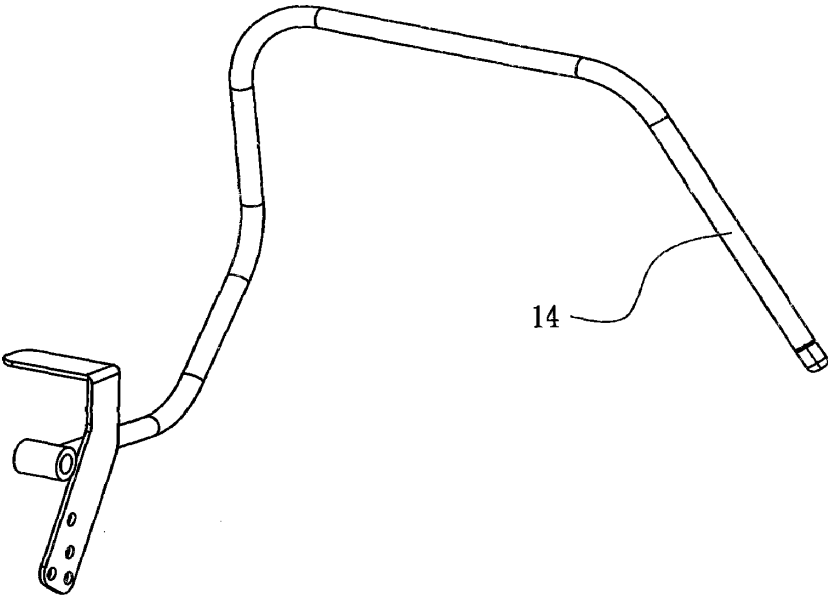


图 16

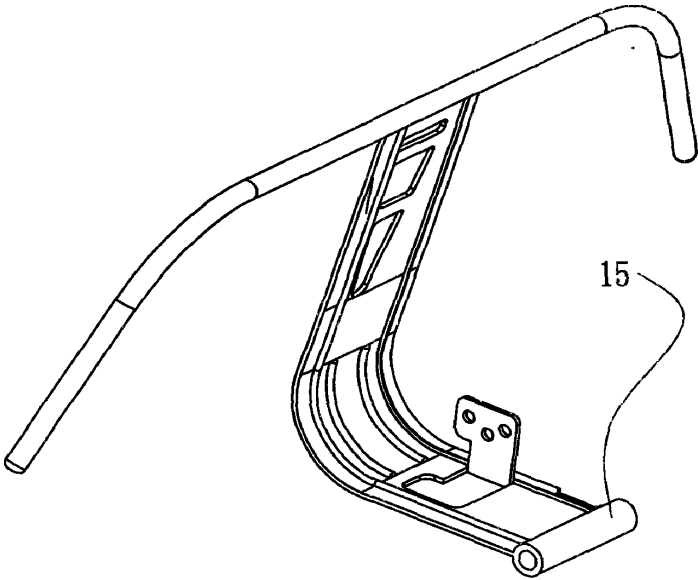


图 17

**English Abstract:**

The patent refers to the field of 'harvesting or mowing cereals or grass'. The invention relates to a lawn mower for pruning lawns at places, such as courtyards, parks, road sides and the like, particularly to an environment-friendly (with artificial foot protection and silencing slots) pushing-riding dual-purpose mower. The invention has the main improvements that a grass feeding rod comprising reverse hook teeth is arranged at the front part of the lawn mower; an artificial foot protection plate comprising a rotary hinge is respectively arranged at both sides of the middle part of the mower; a pushing-riding dual-purpose wheel comprising a foot pedal is arranged at the rear part of the mower; a silencing slot (comprising a silencing pipe and a water tank) is particularly and additionally arranged; a balancing weight is replaced by water, thereby lowering the transportation cost; self-moving is assisted by foot pedaling, thereby saving fuel and exercising bodies; the silencing pipe is added, thereby reducing the noise; the protection plates are added, thereby ensuring the safety; pressed grass is also centered; and the lawn grass-pressing mower with the comprehensive effect is beneficial to grass feeding, weight balancing, noise reduction, temperature reduction, energy saving, environmental protection, soil moisture preservation and safety.

**English Description:****Technical Field**

The invention relates to a device for garden, park and road side trimming lawn places such as a lawn mower, a major improvement is that the front part of the lawn mower is provided with a containing the inverted enters the grass pole ; lawn mower on two sides of the middle portion of the hinge is provided with a containing artificial foot guard plate; lawn mower is arranged at the rear part of the foot-containing used for pushing and riding wheel; in particular disappears the sound track of a (containing muffler pipes and water tank); to comprehensive effect feeds the grass , weight, noise reduction, cooling, energy-saving, environmental protection, soil moisture and safe lawn grass mower.

**Background Art**

Is widely used for lawn mower according to the preferences of the selected mode to the mowing. Some operation-walker like and used when the mower, in the latter half of the upper arm-rest of the and a slightly larger depending on the feeling of and pressed down, this will virtually increase the tilting of the front wheel may be suspended; and design also should, as far as possible of the lawn-mower for comfort and convenience of the user. The front of a lawn mower of the gasoline engine is also less packaging, heavier of the engine. But there are also pre-warped upwards before the left front wheel, and in particular, the occurrence of bad phenomenon. The purposes for the electric mower, because the electric motor than engine light, and the motor to drive the rotary diameter of the shaft is very large

grass cutting knife, but also cannot be too by front mounting, the front wheel of the electric mower more common curls upwards lifts phenomenon. Furthermore, in accordance with the relevant standards such as GB4706.78? 2005 ; IEC60335? 2? 77? 2002 ; EN836? 1997 standard, especially EN836/A3? 2004/4 . 2.3.2 . 1-4.2 . 3.2.3 . 3, have a slope 16.7 degrees of the standard requirement. Adding the counterweight in the front part of the sand-kettle, is mounted to the chassis, three-hole is to be added, also to adds the grit , is relatively troublesome. Because of the relatively heavy weight, transport the cost is also high.

Furthermore, when mowing in practice, because the front of the mower is relatively narrow, it is difficult to foresee the swath, therefore, repeated cutting and drain cutting that is, omission of a strip dahuricus no cutting phenomenon is a common occurrence, has to fill cutting. Furthermore, both sides of the front part of the mower, the grass, also are the overwhelming without cutting.

Muffler is widely used as a small gasoline engine internal combustion engine, in particular of the silencing device, mounted in the cylinder cover upper exhaust door, to reduce noise in the process of operation of the engine. Various all the countries in the world of the lawn-mower traveling vehicle and all have associated noise of the provisions of the limit value, the exhaust muffler is one such to reduce the exhaust noise of the device. Performance evaluation of the muffler acoustic performance are the main, such as aerodynamic performance and structural performance indicators. A considerable part of the internal-combustion engine to the low-frequency fluctuation of the noise source, the resistance or impedance model and microplate muffler. Common muffler of the internal combustion engine, especially for a small-sized gasoline engine is of the three-cavity type muffler of the muffler, the muffling effect is limited; and a larger external to the protective cover, but there is no silencing effect of its own. Furthermore, a high temperature rise the shell, hot, safety implications.

Prosthetic foot protection in the standard STD.BSI EN 836? ENGL 1997 and GB 4706.78? 2005/IEC 60335? 2? 77:2002 have the relevant requirements. Most lawn mower mowing height is a multi-stage adjustable, the operation of the security of the feet of the Walker in accordance with strict control of the safety requirements. This usually is skullduggery foot test. However, artificial foot test per day more measuring required to be tested, the number of the product too little coverage. That already have shipments of the lawn mower, individual who are artificial feet of safety measure, however, the full impact of mower order. The improvement to the idea of the mowing blade is often chassis raises in few millimetres. However, because the cutter is a local bending of a thin steel plate, because of tolerance, to a form and position tolerances and assembly of the reasons for the accumulated error, the two ends of the tool tip in a large number in actual production it is very difficult to guarantee that no high-low on a circumferential plane; the matter is difficult avoid the event of an accident, but also to ensure that one of the security issues a-free.

Is widely used for lawn mower according to the preferences of the selected mode to the mowing, some operation-walker like and used to not only can the mowing, and can be rolled



by the lawn mowing of a lawn mower of the width of the. This lawn mower has not usually two rear wheel, the rear only very wide weeding wheel. The primary benefit of the grass roots for the purpose of soil moisture, the second is the pursuit of unique artistic effect. However, common lawn mower to increase, can be self-propelled, can the mowing, is that it is not wide weeding; and existing straw breaking wheel of the lawn mower, is the problem of rubbing due to the straw breaking wheel and gear box and chain unilateral bias; so that the straw breaking wheel of a front wheel of a grass track would be left behind on the long grass without pressure to imprint the grass.

Is widely used for lawn mower according to the preferences of the selected mode to the mowing, some operation-walker like and customary with self-propelled lawn mower. Starting on the handrail, the operating handle and self-propelled operating handle, is used for the plurality of bending the armrest inserted into the coining of the two sides of the case of iron pipe, gap is big, the operating handle or the left or right deflection.

Self-go function is self-propelled lawn mower by an engine drive belt and gear box and of the self-propelled wheels. Self-travel-time on the one hand are consumed more power, on the other hand, the walking operator also for follow-up. If replaced by riding, it will not only can save himself some oil, also can exercise the body, at the same time also to strengthen the effect of weeding moisture.

#### Content of the invention

The present invention provides a lawn mower, is arranged on the front part of the containing inverted enters the grass pole ; lawn mower on two sides of the middle portion of the hinge is provided with a containing artificial foot guard plate; lawn mower is arranged at the rear part of the foot-containing used for pushing and riding wheel; in particular disappears the sound track of a (containing muffler pipes and water tank) and the movable support; the left and right is not too houg operating handle; to comprehensive effect feeds the grass , weight, noise reduction, cooling, energy-saving, environmental protection and safety, with the lawn mower.

The invention for solving the technical problems is the technical proposal adopted by:

The front part of the lawn mower is provided with a containing the inverted enters the grass pole (6); to set up in the front of the mower feeds the grass mouthenters the grass pole the two sides of the ball and the pole head, a plurality of of the rod the inverted; the sphere is equal to the distance between the mowing width; which is characterized in that the enters the grass pole is provided with a plurality of inverted of the rod, and is provided with a ball on the club head. The front part of the lawn mower is provided with a of the inverted enters the grass pole , the two sides of the feeding pins; and club head in accordance with the spherical body of the mowing wide travel indicating function, and a symbolic armor armor gehin versicolora like decoration effect.

The present invention provides a kind of disappears the sound track , containing user (7) and a water tank (2); as an extension, or expanded or connected to the water tank, may be called a water tank (9); the silencing tube (7) immersed in the lower part of the water pipe (2) and, or a water tank (9) in, in order to have the cooling effect. The role of the water tank is to kill two birds with one stone, in addition to cooling the outer, heavy water generation also; because it is arranged in the front part of the mower, a counterbalance the. Furthermore, to facilitate placing the counterweight, the counterweight or water tank, or heavy weight of the bucket or in addition, water is the only time, the transport weight as a result of these do not meter; the front of the mower is provided with a rotating hinge (10a) of the counterweight frame (10). The role of the windows is retracted during transportation, the total is in order to reduce the transportation cost. The silencing tube (7) at the lower part of the lower end of the elbow is connected with the outlet of the muffler. The water tank (2) is characterized in that, the side face is provided with a through hole (2c) in order to with the silencing tube (7) is matched with the lower part of the pipe; furthermore is arranged at the bottom thereof (2d). The counterweight frame (10) is characterized in that is provided with a rotating hinge (10a); and a bending of the five sections, the middle section of the main body can be made. The silencing tube (7) composed of a plurality of sections of inner pipe (7a) and a connecting piece and a plurality of the wedge containing microporous (7b) of a of the array. Said inner pipe (7a) is characterized in that its is provided with a honeycomb of hexagonal apertures; and the plurality of sections of the inner tube length is the length of the different and; is provided with a section, for example, three-quarters wavelength (multiplication coefficient) of the longer inner tube, the adjacent, only its quarter wavelength (multiplication coefficient) of the inner pipe. Furthermore, the inner pipe (7a) is provided with a plurality of holes on the distribution is not uniform and is of a density; especially those located in three-quarters wavelength (multiplication coefficient) on a section of the middle part of the length of the pipe a quarter of the part of the eyelet of a relatively dense, the remaining part of the loop is a; and the eyelet is characterized in that the hexagonal hole or opening of the; with the eyelet a quarter of a wavelength (multiplication coefficient) is characterized in that of the inner tube is provided with a plurality of holes on the distribution is not uniformly distributed with a density which is; located in the section of pipe in the middle of the three eighths of the length of the pipe is a relatively dense punchhole, the remaining part of the loop is relatively thin. The eyelet is polygonal, in particular hexagonal; as an improvement, or its eyelet is characterized in that the opening, in particular a hexagonal, that is, a turned-over edge of the polygon chip; or its eyelet is characterized in that the wedge a micropore (7b). Having quarter-wavelength effect and density wave effect and honeycomb effect. The outer pipe (7b) on the surface, is provided with a plurality of stamping forming the convex, polyhedral cone is multi-pyramid shape, especially hexagonal pyramid shape , referred to as a wedge (7b); said wedge is characterized in that, the the root of the stamping from metal sheet is hexagonal, is narrowed from the root of the broad, substantially its width depth ratio is a ratio of a, d or to a ratio. The silencing tubes and the surface of the each of the six pyramid shape of the top of the wedge is provided with a microporous, with a diameter of approximately 0.1 to 0.5 mm is suitable. In the inner pipe (7a) on the surface, as an improvement, or can also be of the many punching is convex, polyhedral cone is multi-pyramid shape, especially hexagonal pyramid

shape, can also be referred to as a wedge, but its wide 0.8 depth ratio as a ratio, or to 1.4 than one. A structure of a wedge many a great deal of the wedge, its in various surface of a hexagonal honeycomb shape is polygonal, or random. In the silencing tube or may be half-filled with a metal fiber or high temperature resistant non-metallic material; or may be half-filled with medium-temperature-resistant sound-absorbing material, especially porous sound-absorbing material or flexible material and film-like materials. Of the porous material, such as fiber, froth class, particles, is used, more or less is mixed application. Can use fiber such as rock wool, or glass fiber, or glass wool in particular ultra-fine glass wool; or fireproof froth class; or polyols such as expanded perlite particles, porous tao Tuzhuan, and heat-resistant fabric, or stick to filling the felt comes; to facilitate the further improved performance index, the consolidated composition can achieve the purpose of noise reduction effect. A plurality of material has a complementary high and low frequency sound absorption efficiency. Many wedge, gado, the heat dissipation area; in particular, many with microporous wedge, noise reduction not only are the capillary effect, but also the potential effectiveness of liquid drains excessively many. As the extension, can also be anti-draw that is, a great deal of the wedge in order to increase the radiating area to the outside. Also between the muffler and the engine can be assembled not only as a heat shock absorbing pad and the shim. The outlet of the muffler with the silencing tube (7) can be assembled also between not only as a heat shock absorbing pad and the shim. The present invention provides the disappears the sound track provided with a plurality of large area of the wedge-area, of containing a large number of micropores are of a wedge, a wedge effect and microporous anti-falls effect. disappears the sound track provided by the invention has the advantages of: increasing the silencing effect of the muffler and improving performance such as insertion loss, sound transmission loss, and decrement reduces chirp the quantity, and cooling.

The invention provides a lawn mower, in addition is provided with a at the front part of the containing the inverted enters the grass pole and the disappears the sound track of the outer, also in the lawn mower on two sides of the middle portion of the hinge is provided with a containing artificial foot protection plate (1). The middle part of the mower are arranged on both sides of the hinge-containing artificial foot protection plate (1) by the guard plate (1a) and rotating hinge (1b); which is characterized in that the protective plate is left, the right one of the; but when sometimes side lysimachia foenumgraecum board is placed on the right side, the left side is the only artificial foot guard plate; the protective the best appearance is a pictographic foot of the two ends of the wave-shaped slightly larger, in order to strengthen the foot to be careful of warning Lenovo and artistic Image; in particular preferably the protective until soft but not too soft of the shore hardness of 65 to 95 material such as rubber, polyurethane or polyvinyl chloride as the main plate, is placed at the same level to work when the grass is not easy to be more flexible, and the rubber plate is more convenient for encasing. The protective hard material can also be used. The protective edge is provided with a movable hinge, is not limited to one or a plurality of or flexible material, with suitable restrictive limit, as long as it can make the said apron discharge level is up to the work and to the encasement. As extension or improve, the shields also can be designed as a detachable, placed on the work, when not work. In order to take preventive measures, prevention, to ensure that a large number of shipments of the whole machine is fully through the prosthetic

foot detection, existing mower the extension shears in order to compensate for the uneven due to the lack of two head tip, it is hereby provided for the mowing machine test cutting knife when the height of the feet of the guard plate.

The present invention also provides for pushing and riding mower, with the lawn mower is arranged at the rear part of the pedal is for pushing and riding wheel; additional provided with disappears the sound track (containing muffler pipes and water tank) and movable counterweight support, artificial foot guard plate and; also improved knightheads of (8), and the left and right is not too hounq of the operating handle, and to left and right symmetrical imprinting without leakage to the straw breaking wheel; so the overall effect is beneficial to feeds the grass , weight, noise reduction, cooling, energy-saving, environmental protection and safety, soil moisture.

The containing of a lawn mower of the surface of the foot is arranged at the rear part for pushing and riding wheel, by a telescopic knightheads is (8), plate (3), pedal (4), riding seat ((5) and can be dismantled and can be the rotation of the bracket, characterized in that the plate (3) with each side of the left and right of the a-like pedal bicycle-like foot; pedal traffic axis of the plate, or may be provided with a one-way bearing; the base ((5) and the rotation can be dismantled and can be the length of the adjustable support, the surface of the inner tube of the telescopic tube of the small tube approach to adjusting. The plate (3) also may refer to the different soil and choose the width.

The left and right is not too hounq operating handle, by means of the mounting hole on the pole bolt (13); passes through the bolt (13) with a shaft sleeve of the self-propelled operating handle, and passes through the bolt (13) with a shaft sleeve of the starting operating handle, the 2 a is the common feature of the handle with the pole bolt (13) and is matched with the diameter of the gap is not large so that the left and right is not too hounq of the shaft sleeve; and the upward of the upper arm-rest knightheads reaches curved 85 degrees of included angle.

The left and right symmetrical non-leaking stay impression to straw breaking wheel (12) is characterized in that, the installation position of the lawn-mower is symmetrical along the central axis; and the length of the straw breaking wheel of greater than the internal distance between the two front wheels. Now adjust the position of the gear box and associated mechanism, to make it hard. sine wave type structure of the gear box; high jump pull rod built-in.

Because of the straw breaking wheel, pulley is relatively high, so that the lawn mower of the present invention is characterized in that the bottom of the collection grass box of the ramping down of the high and the lower edge of the bottom surface of the rear part of the box body in order to keeps the grass.

Description of drawings

With the embodiment of the Figures and further explanation of the present invention.

Figure 1 is a schematic diagram of two pushes rides of this invention for the mower.

Figure 2 is a schematic diagram of guard plate.

Figure 3 is a schematic perspective view of a ring of the outer pipe of the characteristic of the wedge.

Figure 4 is a schematic diagram of the characteristic and a water tank.

Figure 5 is a schematic diagram of the water tank.

Figure 6 is a schematic diagram of the inner tube of the characteristic.

Figure 7 is a schematic diagram of plate (3) and the foot (4).

Figure 8 is a schematic diagram of two pushes rides of the present invention for removal of the whole machine riding mower for sliding only.

Figure 9 is a schematic diagram of the characteristic and a large water tank (9) of the front part of the mower.

Figure 10 is section of a wedge.

Figure 11 is a head-up a schematic diagram of the bottom of the mower.

Figure 12 is front view a schematic diagram of the front part of the mower.

Figure 13 is a schematic diagram of the counterweight frame.

Figure 14 is a schematic diagram of straw breaking wheel.

Figure 15 is a schematic diagram of a long rod bolt.

Figure 16 is a schematic diagram of the self-propelled operating handle.

Figure 17 is a schematic diagram of the starting operating handle.

As shown in Figure 1 to the Figure 17 is shown, in:

1. Is false foot guard plate;
  - 1a. Is protective plate;
  - 1b. The rotation of the is guard hinge;
2. Is water tank;
  - 2c. Is the through hole of the water tank;
  - 2d. A water drain port of the water tank;
3. Plate is;
4. The foot pedal;
5. A riding seat;
6. Is enters the grass pole ;
7. Is user;
  - 7a. The inner pipe is the characteristic;
  - 7b. Is of a wedge;
8. Knightheads is;
9. Is water tank;
10. Is the counterweight frame;

10a. Is the rotation of the weight rack hinge;

11. A front wheel;

12. Is straw breaking wheel;

13. The bolt is long;

14. Is self-walking operating handle;

15. A start operating handle.

#### Mode of execution

Is widely used for lawn mower according to the preferences of the selected mode to the mowing. Some operation-walker like and customary push mower; and some the operator can choose to riding mowing. The present invention may be used for to the garden, park and road side trimming lawn places such as a lawn mower, that is, environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower; the lawn mower a major improvement is that of an inverted-containing enters the grass pole is arranged at the front part; a mower is provided with two sides of the middle portion of the hinge-containing artificial foot guard plate; lawn mower is arranged at the rear part of the foot-containing used for pushing and riding wheel; in particular disappears the sound track of a (containing muffler pipes and water tank); to comprehensive effect feeds the grass , weight, noise reduction, cooling, energy-saving, environmental protection, soil moisture and safe lawn grass mower.

Mowing original, because the front of the mower is relatively narrow, it is difficult to foresee the swath, therefore, repeated cutting and drain cutting that is, omission of a strip dahuricus no cutting phenomenon is a common occurrence, has to fill cutting. Furthermore, the both sides of the front of the mowing of grass, have also been of the front wheel to the overwhelming without cutting, of the inverted enters the grass pole containing the status on the improved. The lawn mower is arranged on the front part of the containing inverted enters the grass pole (6); to set up in the front of the mower feeds the grass mouthenters the grass pole the two sides of the ball and the pole head, a plurality of of the rod the inverted; the sphere is equal to the distance between the mowing width; which is characterized in that the enters the grass pole is provided with a plurality of inverted of the rod, and is provided with a ball on the club head, the front of the lawn mower is provided with a of the inverted enters the grass pole , the two sides of the feeding pins; and club head in accordance with the spherical body of the mowing wide travel indicating function, and a symbolic armor armor gehin versicolora like decoration effect. When the requirement, can be packed up rod (6).

Lock tongues seat (10) and a water tank (9), must adds the rabbet of clean water, re-starting.

Because the present invention provides a disappears the sound track , containing user (7) and a water tank (2); as an extension, or expanded or connected to the water tank, may be called a water tank (9); check the silencing tube (7) immersed in the lower part of the water pipe (2) and, or a water tank (9) in, in order to have the cooling effect. The role of the water tank is to kill two birds with one stone, in addition to cooling the outer, heavy water generation also; because it is arranged in the front part of the mower, a counterbalance the. Furthermore, to facilitate placing the counterweight, the counterweight or water tank, or heavy weight of the bucket or in addition, water is the only time, as a result of these and the weight of water is not meter long-distance transportation, the front of the mower is provided with a rotating hinge (10a) of the counterweight frame (10). The role of the windows is retracted during transportation, the total is in order to reduce the transportation cost. The silencing tube (7) at the lower part of the lower end of the elbow is connected with the outlet of the muffler. The water tank (2) is characterized in that, the side face is provided with a through hole (2c) in order to with the silencing tube (7) is matched with the lower part of the pipe; furthermore is arranged at the bottom thereof (2d). The counterweight frame (10) is characterized in that is provided with a rotating hinge (10a); and a bending of the five sections, the middle section of the main body can be made.

Because the silencing tube (7) composed of a plurality of sections of inner pipe (7a) and a connecting piece and a plurality of the wedge containing microporous (7b) array a; small-sized gasoline engine because of internal combustion engine, in particular of the combustion in the combustion chamber, so to do work by the exhaust gas after the exhaust valve is discharged, into cavity 1st in the muffler (1) post-expansion, according to the noise reduction principle, the frequency of its exhaust gas is reduced due to the large and small volume. The exhaust cavity through the lumen of the lower plate and the upper plate side through-hole and the screen after reducing frequency once again enter the 2nd chamber swell. Decreasing the frequency of the exhaust gas through the lumen side of the lower plate of the upper and middle through-holes after reducing frequency once again entering the 3rd cavity, once again expansion, decreasing the frequency. Furthermore, the 3rd through the muffler outlet to the exhaust of the silencing tube (7) at the lower end of the of the elbow at the lower part of the inner pipe is provided with holes (7a), the exhaust gas after expansion from the inner pipe (7a) is characterized in that its is provided with a honeycomb of hexagonal apertures in the outer tube; and the plurality of sections of the inner tube length is the length of the different and; is provided with a section, for example, three-quarters wavelength (multiplication coefficient) of the longer inner tube, the adjacent, only its quarter wavelength (multiplication coefficient) of the inner pipe. Furthermore, the inner pipe (7a) is provided with a plurality of holes on the distribution is not uniform and is of a density; especially those located in three-quarters wavelength (multiplication coefficient) on a section of the middle part of the length of the pipe a quarter of the part of the eyelet of a relatively dense, the remaining part of the loop is a; and the eyelet is characterized in that the hexagonal hole or opening of the; with the eyelet a quarter of a wavelength (multiplication coefficient) is characterized in that of the inner tube is provided with a plurality of holes on the distribution is not uniformly distributed with a density which is; located in the section of pipe in the middle of the three eighths of the length of the pipe is a relatively dense



punchhole, the remaining part of the loop is relatively thin. The eyelet is polygonal, in particular hexagonal; as an improvement, or its eyelet is characterized in that the opening, in particular a hexagonal, that is, a turned-over edge of the polygon chip; or its eyelet is characterized in that the wedge a micropore (7b), so it has a quarter wavelength effect and density wave effect and honeycomb effect. The half-filled in a silencing tube, a plurality of materials are filled or is attached to, the exhaust gas after expansion through several setbacks, finally from the upper part of the discharge characteristic of the elbow. To facilitate the further improved performance index, the consolidated composition can achieve the purpose of noise reduction effect. A plurality of material has a complementary high and low frequency sound absorption efficiency. Many wedge, gado, the heat dissipation area; in particular, many with microporous wedge, noise reduction not only are the capillary effect, but also the potential effectiveness of liquid drains excessively many. The present invention provides the disappears the sound track provided with a plurality of large area of the wedge-area, of containing a large number of micropores are of a wedge, a wedge effect and microporous anti- falls effect.

The middle part of the mower are arranged at both sides of the hinge-containing artificial foot protection plate (1), when the work should be, the horizontal position approximate place. Because of the mower is provided with two sides of the middle portion of the hinge-containing artificial foot protection plate (1) by the guard plate (1a) and rotating hinge (1b) formed by the; left plate is therefore against , a mounting of the right; but when sometimes side lysimachia foenumgraecum board is placed on the right side, the left side is the only artificial foot guard plate; because the protective the best appearance is a pictographic foot of the two ends of the wave-shaped slightly larger, can enhance the foot to be careful of warning Lenovo and artistic ornamental effect. In particular preferably the protective until soft but not too soft of the shore hardness of 65 to 95 material such as rubber, polyurethane or polyvinyl chloride as the main plate, is placed at the same level to work when the grass is not easy to be more flexible, and the rubber plate is more convenient for encasing. The protective hard material can also be used. The protective edge is provided with a movable hinge, is not limited to one or a plurality of or flexible material, with suitable restrictive limit, as long as it can make the said apron discharge level is up to the work and to the encasement. As extension or improve, the shields also can be designed as a detachable, placed on the work, when not work. In order to take preventive measures, prevention, the anti-counterfeit foot test cutting knife height of the protection plate, can ensure that a large number of shipments of the whole machine is fully through the prosthetic foot detection, existing mower the extension shears in order to compensate for the uneven due to the lack of two head tip.

The invention provides a two-purpose mower pushes rides , there are two options to the operator. Because the containing of a lawn mower of the surface of the foot is arranged at the rear part for pushing and riding wheel, by a telescopic knightheads is (8), plate (3), pedal (4), riding seat ((5) and which can be detached and the rotating bracket, and the inner tube of the telescopic tube of the small tube to the adjustable, therefore, pulled out downwards, desirable part of the lower part, as shown in Figure 8 the a push mower. On the other hand, a

part of the assembly, is a riding lawn mower. Because the plate, and (3) the left and right of each side of the a-like pedal bicycle-like pedal; and a pedal traffic axis of the plate, or may be provided with a one-way bearing; and the base (5) and the rotation can be dismantled and can be the length of the adjustable support, the inner tube of the telescopic tube of the small tube to the adjustable, convenient riding. The plate (3) also may refer to the different soil and choose the width.

Because of the improved operating handle, by means of the mounting hole on the pole bolt (13); passes through the bolt (13) with a shaft sleeve of the self-propelled operating handle, and passes through the bolt (13) with a shaft sleeve of the starting operating handle, the 2 a is the common feature of the handle with the pole bolt (13) and is matched with the diameter of the gap is not large so that the left and right is not too hough of the shaft sleeve, the operating handle is not too hough the left and right.

Because of the adoption of the left and right symmetrical non-leaking stay impression to straw breaking wheel (12), and the mounting position of the lawn-mower is symmetrical along the central axis; and the length of the straw breaking wheel of greater than the internal distance between the two front wheels. Because now adjust the position of the gear box and associated mechanism, to finally, in the; and from the block and of the gear box structure for sine wave type ; and increase in the pull rod is arranged on the machine body, the more attractive appearance.

Because of the straw breaking wheel, pulley is relatively high, so that the lawn mower of the present invention is characterized in that the bottom of the collection grass box of the ramping down of the high and the lower edge of the bottom surface of the rear part of the box body in order to keeps the grass. Also because of the telescopic knightheads and the end (8), the discharge space is collection grass box ; the handrail (8) stegnotic of the upper part of, and the upper arm-rest with reaches curved knightheads is 85 degrees of included angle improves the decoration, and more convenient operation.

**ENGLISH CLAIMS:**

1. An environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower, by its is arranged on the front part of the containing enters the grass pole inverted (6); a mower is provided with two sides of the middle portion of the hinge-containing artificial foot protection plate (1); lawn mower is arranged at the rear part of the foot-containing for wheels of pushing and riding plate (3) and the foot (4) and base (5); and the silencing tubes disappears the sound track (7) and a water tank (2) and water tank (9), the counterweight frame (10); the handrail (8), operating handle (14), (15), a long rod bolt (13) the composition.

2. An environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower according to Claim 1, which is characterized in that: said enters the grass pole (6) is provided with a plurality of inverted of the rod, and is provided with a

ball on the club head.

3. An environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower according to Claim 1, which is characterized in that: the characteristic of containing disappears the sound track (7) and a water tank (2) and water tank (9); and is provided with a rotating hinge (10a) of the counterweight frame (10); the silencing tube (7) at the lower part of the lower end of the elbow is connected with the outlet of the muffler; the water tank (2) is characterized in that, the side face is provided with a through hole (2c), furthermore is arranged at the bottom thereof (2d).

4. An environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower according to Claim 1, which is characterized in that: the silencing tube (7) composed of a plurality of sections of inner pipe (7a) and a connecting piece and a plurality of the wedge containing microporous (7b) of the outer tube; and said inner pipe (7a) is characterized in that its is provided with a honeycomb of hexagonal apertures; and the plurality of sections of the inner tube length is the length of the different and; is provided with a section, for example, three-quarters wavelength (multiplication coefficient) of the longer inner tube, the adjacent, only its quarter wavelength (multiplication coefficient) of the inner pipe; in addition, the inner pipe (7a) is provided with a plurality of holes on the distribution is not uniform and is of a density; especially those located in three-quarters wavelength (multiplication coefficient) on a section of the middle part of the length of the pipe a quarter of the part of the eyelet of a relatively dense, the remaining part of the loop is a; and the eyelet is characterized in that the hexagonal hole or opening of the; with the eyelet a quarter of a wavelength (multiplication coefficient) is characterized in that of the inner tube is provided with a plurality of holes on the distribution is not uniformly distributed with a density which is; located in the section of pipe in the middle of the three eighths of the length of the pipe is a relatively dense punchhole, the remaining part of the loop is a; the eyelet is polygonal, in particular hexagonal; as an improvement, or its eyelet is characterized in that the opening, in particular a hexagonal, that is, a turned-over edge of the polygon chip; or its eyelet is characterized in that the wedge a micropore (7b); said outer pipe (7b) on the surface, is provided with a plurality of convex, polyhedral cone is multi-pyramid shape, especially hexagonal pyramid shape, referred to as a wedge (7b); said wedge is characterized in that, is hexagonal at the root thereof, of the valves is reduced from a root; said six pyramid shape of the top of the wedge is provided with a microporous, its diameter in the 0.1 to 0.5 mm; in the silencing tube filled with a plurality of sound-absorbing material.

5. An environment-friendly (with a false foot protection and disappears the sound track) for pushing and riding mower according to Claim 1, which is characterized in that: the mower is provided with two sides of the middle portion of the hinge-containing artificial foot protection plate (1), by the protective plate (1a) and rotating hinge (1b); ; the protective the best appearance is a pictographic foot of the wave of the two head slightly greater; or the protective with Shao the hardness is 65 to 95 is made of a material.

6. An environment-friendly (with a false foot protection and disappears the sound track) for

pushing and riding mower according to Claim 1, which is characterized in that:

The containing of a lawn mower of the surface of the foot is arranged at the rear part for pushing and riding wheel, by a telescopic knightheads is (8), plate (3), pedal (4), riding seat ((5) and can be dismantled and can be the rotation of the bracket, characterized in that the plate (3) with each side of a foot, and the rotation can be dismantled and can be the length of the adjustable support, the inner tube of the telescopic tube of the small tube to the adjusting; the left and right is not too hounng operating handle, by means of the mounting hole on the pole bolt (13); passes through the bolt (13) with a shaft sleeve of the self-propelled operating handle, and passes through the bolt (13) with a shaft sleeve of the starting operating handle, the 2 a is the common feature of the handle with the pole bolt (13) and is matched with the diameter of the shaft sleeve of the gap is not large; and the upward of the upper arm-rest knightheads reaches curved 85 degrees of included angle; said straw breaking wheel (12), the mounting position of the lawn-mower is symmetrical along the central axis; and the length of the straw breaking wheel of the two front wheels is greater than the internal distance; and high jump pull rod built-in; collection grass box is characterized in that part of the bottom of the of the fixed part along the high and low bottom surface of the rear part of the box body.



## (12) 发明专利申请

(10) 申请公布号 CN 102683052 A

(43) 申请公布日 2012.09.19

(21) 申请号 201210190041.2

(22) 申请日 2012.06.11

(71) 申请人 海安县威仕重型机械有限公司

地址 226000 江苏省南通市海安开发区

(72) 发明人 丁成进

(51) Int. Cl.

H01H 1/16 (2006.01)

H01H 15/00 (2006.01)

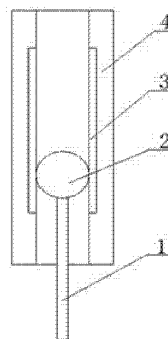
权利要求书 1 页 说明书 2 页 附图 1 页

### (54) 发明名称

一种抽拉结构的开关

### (57) 摘要

本发明公开了一种抽拉结构的开关,包括硬质导电棒、球形接触体、滑管和导电套,其中硬质导电棒、球形接触体和导电套为导体,滑管为绝缘体;球形接触体固定在硬质导电棒上,在滑管的内壁上设置有与导电套形状、尺寸相适配的凹槽,导电套嵌入在凹槽内;导电套的长度小于滑管的长度,球形接触体的直径大于等于导电套的内径,硬质导电棒的外径小于导电套的内径;球形接触体置于滑管内。本发明提供的抽拉结构的开关,结构简单、使用方便,其能够在一定行程范围内保持打开或断路状态。



1. 一种抽拉结构的开关,其特征在于:该开关包括硬质导电棒(1)、球形接触体(2)、滑管(4)和导电套(3),其中硬质导电棒(1)、球形接触体(2)和导电套(3)为导体,滑管(4)为绝缘体;球形接触体(2)固定在硬质导电棒(1)上,在滑管(4)的内壁上设置有与导电套(3)形状、尺寸相适配的凹槽,导电套(3)嵌入在凹槽内;导电套(3)的长度小于滑管(4)的长度,球形接触体(2)的直径大于等于导电套(3)的内径,硬质导电棒(1)的外径小于导电套(3)的内径;球形接触体(2)置于滑管(4)内。

2. 根据权利要求1所述的抽拉结构的开关,其特征在于:所述滑管(4)的个数为一个,导电套(3)的个数为一个以上,所有导电套(3)长度之和小于滑管(4)的长度,且导电套(3)间存在间隙。

3. 根据权利要求1所述的抽拉结构的开关,其特征在于:所述滑管(4)为弹性材质。

## 一种抽拉结构的开关

### 技术领域

[0001] 本发明涉及一种机械式电路开关,尤其涉及一种抽拉结构的开关。

### 背景技术

[0002] 开关是控制电路导通或断开的元器件,常用的机械开关为按钮式开关或旋钮式开关,开关的触点位置固定,限制了开关应用产品的开发。比如说台灯灯泡位置的固定等。

### 发明内容

[0003] 发明目的:为了克服现有技术中存在的不足,本发明提供一种抽拉结构的开关,其能够在一定行程范围内保证开关的导通状态或断开状态。

[0004] 技术方案:为解决上述技术问题,本发明采用的技术方案为:

一种抽拉结构的开关,包括硬质导电棒、球形接触体、滑管和导电套,其中硬质导电棒、球形接触体和导电套为导体,滑管为绝缘体;球形接触体固定在硬质导电棒上,在滑管的内壁上设置有与导电套形状、尺寸相适配的凹槽,导电套嵌入在凹槽内;导电套的长度小于滑管的长度,球形接触体的直径大于等于导电套的内径,硬质导电棒的外径小于导电套的内径;球形接触体置于滑管内。

[0005] 上述结构的开关,使用时将导电套和硬质导电棒分别与电源的正负极连接后,通过调节球形接触体在滑管内的位置,即可实现开关控制,当球形接触体与导电套接触时,电路导通,当球形接触体与滑管接触时,电路不导通;为了保证球形接触体与导电套的有效接触,要求球形接触体的直径等于或略大于导电套的内径;为了防止硬质导电棒与导电套的接触,要求硬质导电棒的外径小于导电套的内径;由于导电套具有一定的长度,因而该开关能够保证在一定行程内保持导通状态。

[0006] 作为一种设计结构,所述滑管的个数为一个,导电套的个数为一个以上,所有导电套长度之和小于滑管的长度,且导电套间存在间隙;这样,当迫使球形接触体在滑管内沿一个方向移动时,就可以间歇性的实现导通。

[0007] 优选的,所述滑管为弹性材质,这样就可以使得球形接触体能够有效定位在滑管内的相应位置了。

[0008] 有益效果:本发明提供的抽拉结构的开关,结构简单、使用方便,其能够在一定行程范围内保持打开或断路状态。

### 附图说明

[0009] 图1为本发明的结构示意图。

### 具体实施方式

[0010] 下面结合附图对本发明作更进一步的说明。

[0011] 如图1所示为一种抽拉结构的开关,包括硬质导电棒1、球形接触体2、一个滑管4

和一个导电套 3,其中硬质导电棒 1、球形接触体 2 和导电套 3 为导体,滑管 4 为弹性绝缘体;球形接触体 2 固定在硬质导电棒 1 上,在滑管 4 的内壁上设置有与导电套 3 形状、尺寸相适配的凹槽,导电套 3 嵌入在凹槽内;导电套 3 的长度小于滑管 4 的长度,球形接触体 2 的直径大于等于导电套 3 的内径,硬质导电棒 1 的外径小于导电套 3 的内径;球形接触体 2 置于滑管 4 内。

[0012] 上述结构为一个基本结构,还可以设计滑管 4 的个数为一个,导电套 3 的个数为两个或两个以上,但要求所有导电套 3 长度之和小于滑管 4 的长度,且导电套 3 间距存在间隙。

[0013] 以上所述仅是本发明的优选实施方式,应当指出:对于本技术领域的普通技术人员来说,在不脱离本发明原理的前提下,还可以做出若干改进和润饰,这些改进和润饰也应视为本发明的保护范围。



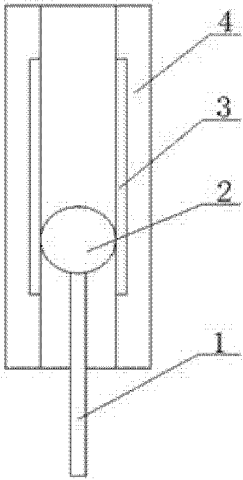


图 1

**English Abstract:**

The patent refers to the field of 'general details of electric switches'. The invention discloses a switch with a drawing structure. The switch comprises a hard conductive rod, a spherical contact body, a sliding pipe and a conductive sleeve, wherein the hard conductive rod, the spherical contact body and the conductive sleeve are conductors; the sliding pipe is an insulator; the spherical contact body is fixed on the hard conductive rod; a groove of which the shape and size are matched with those of the conductive sleeve is formed on the inner wall of the sliding pipe; the conductive sleeve is embedded into the groove; the length of the conductive sleeve is smaller than that of the sliding pipe; the diameter of the spherical contact body is greater than or equal to the inner diameter of the conductive sleeve; the outer diameter of the hard conductive rod is smaller than the inner diameter of the conductive sleeve; and the spherical contact body is arranged in the sliding pipe. The switch with the drawing structure provided by the invention is simple in structure and convenient to use and can be turned on or turned off in a certain travel range.

**English Description:****Technical Field**

The present invention relates to a mechanical circuit switch, in particular to a switch pulling structure.

**Background Art**

Switch is to control the circuit components of the on or off of, the commonly used mechanical switch is a push-button switch or a knob switch, the contact point of the switch position is fixed, limiting the development of the application product of the switch. For instance, fixing of the position of the lamp bulb.

**Content of the invention**

**Purpose of the invention:** in order to overcome the deficiencies in the prior art, the present invention provides a switch pulling structure, which can in a certain stroke range of the switch is ensured in the on-state or the off state.

**Technical proposal:** in order to solve the above technical problem, the invention adopts the following technical solutions:

A pumping drawknot cleaned up through switch, which comprises a hard conductive rod, spherical contactor, a conductive sleeve and, wherein the hard end of the conductive rod,

spherical contactor and conductive sleeve is a conductor, a slide tube is an insulator; spherical contact body is fixed on the rigid guide rod, is arranged on the inner wall of the sliding tube with the conductive sleeve-shaped, is adapted to the size of the groove, the conductive sleeve is embedded into the recess; the length of the conductive sleeve is smaller than the length of the sliding tube, greater than or equal to the diameter of the spherical contact the inner diameter of the conductive sleeve, the hard end of the conductive rod with an outside diameter less than the inner diameter of the sharp teeth on the; spherical contact body is placed within the sliding tube.

The switch of the above-mentioned structure, when in use, the sharp teeth respectively and with the conductive rod after being connected with the positive pole and negative pole of the power supply, the spherical contact by adjusting the position of the sliding tube, the switch control can be realized, when the spherical contactor and contact the conductive sleeve, the circuit is conducted, when the spherical contact body when the contact and the sliding tube, the circuit is not conducted; spherical contact in order to ensure that the effective contact with the conductive sleeve, the diameter of the spherical contact requirement is equal to or slightly larger than the inner diameter of the sharp teeth; in order to prevent hard conductive rod and the conductive sleeve contact, the outer diameter of the rigid requirements of the conductive rod is smaller than the inner diameter of the sharp teeth on the; because the conductive sleeve has a certain length, so that the switch can be maintained in the conducting state for a certain travel.

As a design structure, the one of the number of the states slides , the number of the conductive sleeve is more than one, all conductive sleeve and less than the sum of the length of the length of the sliding tube, conductive sleeve and there is a clearance; in this way, when the force along the spherical contact when moving in one direction, can be intermittent on.

Preferably, the for elastic material states slides , it can make the spherical contact body the sliding tube can be effectively positioned in the in the corresponding position.

Beneficial effects: the present invention provides the drawing of the switch of the structure, the structure is simple, easy to use, in a certain stroke range can be the same to maintain the open or off-state.

#### Description of drawings

Figure 1 is schematic diagram of the structure of the present invention.

#### Mode of execution

This invention is illustrated in the Figure the following further description.

As shown in Figure 1 is a drawing of the switch structure, which comprises a hard conductive rod 1, spherical contactor 2, a slide tube 4 and a conductive sleeve 3, wherein the

rigid guide rod 1, spherical contactor 2 and conductive sleeve 3 is a conductor, the slide pipe 4 is an elastic insulator; spherical contactor 2 is fixed on the rigid guide rod 1 is, in the sliding tube 4 a is arranged on the inner wall of the conductive sleeve 3 shape, the groove is adapted to the size, the conductive sleeve 3 embedded in the groove; the conductive sleeve 3 is less than the length of the sliding pipe 4 of the length, spherical contactor 2 is more than or equal to the diameter of the conductive sleeve 3 the inner diameter of the, hard conductive rod 1 is smaller than the outer diameter of the conductive sleeve 3 the inner diameter of the; spherical contactor 2 in the sliding tube 4 inner.

The above-mentioned structure as a basic structure, can also design a slide tube 4 of the number of the a, conductive sleeve 3 of the number of the two or more than two, but require all the conductive sleeve 3 is slid and is smaller than the sum of the length 4 of the length, and the conductive sleeve 3 there is a clearance distance between the.

The stated above is the preferred embodiment of the invention, it should be noted that: the ordinary Technical Field to the technical personnel, without breaking away from the premise of the principle of the present invention, can also be made a number of improvements and retouches, these improvements and retouches should also be regarded as the scope of protection of this invention.

#### **ENGLISH CLAIMS:**

1. A switch pulling structure, characterized in that the switch comprises a hard conductive rod (1), a spherical contactor (2), sliding tube (4), and conductive sleeve (3), wherein the hard conductive rod (1), a spherical contactor (2) and conductive sleeve (3) is a conductor, the sliding tube (4) is an insulator; spherical contactor (2) is fixed on the rigid conductive rod (1) is, in the sliding tube (4) is arranged on the inner wall of the conductive sleeve (3) shape, the groove is adapted to the size, the conductive sleeve (3) is embedded in the groove; the conductive sleeve (3) is less than the length of the sliding tube (4) the length of the, spherical contactor (2) greater than or equal to the diameter of the conductive sleeve (3) the inner diameter of the, hard conductive rod (1) is smaller than the outer diameter of the conductive sleeve (3) the inner diameter of the; spherical contactor (2) on the sliding tube (4) in.

2. The switch of the structure of drawing according to Claim 1, characterized in that the states slides (4) the number of the a, conductive sleeve (3) more than one of the number of the, all conductive sleeve (3) is smaller than the sum of the length of the sliding tube (4) length, and the conductive sleeve (3) there is a clearance between the.

3. The switch of the structure of drawing according to Claim 1, characterized in that the states slides (4) is an elastic material.

[19] 中华人民共和国国家知识产权局



[12] 实用新型专利说明书

专利号 ZL 200820082722.6

[51] Int. Cl.

H01H 15/00 (2006.01)

H01H 15/10 (2006.01)

H01H 9/04 (2006.01)

[45] 授权公告日 2008 年 11 月 5 日

[11] 授权公告号 CN 201146132Y

[22] 申请日 2008.1.24

[21] 申请号 200820082722.6

[73] 专利权人 胡国雄

地址 311800 浙江省诸暨市滨江中路 33 号 3  
单元 - 102 室

[72] 发明人 胡国雄

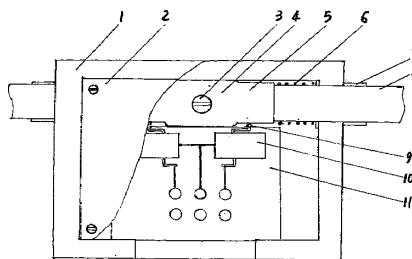
权利要求书 1 页 说明书 3 页 附图 1 页

[54] 实用新型名称

滑动式双开关

[57] 摘要

本实用新型涉及一种滑动式双开关，主要由滑动式双开关的壳体及设于壳体上的开关所组成，所述的壳体上设有防尘盖，在壳体内设有绝缘板，在绝缘板上安装两只开关，开关的上方设有开关按钮，在壳体内还设有动滑连杆，动滑连杆分别被置于壳体的两边，并设有衬套，在滑动连杆的中间设有动滑块，动滑块的中间设有凸起块，动滑块设于两开关的中间，动滑凸起块可以拨动两开关上方的开关按钮，动滑块的两边还设有弹簧，动滑块上还设有定位螺丝，定位螺丝暴露在防尘盖外，其端部设有行程双开关拨手。本实用新型适用于电脑绣花机长拉杆的开关控制。



1、一种滑动式双开关，由滑动式双开关的壳体（1）及设于壳体（1）上的开关（10）所组成，所述的壳体（1）上设有防尘盖（2），其特征在于在壳体（1）内设有绝缘板（11），在绝缘板（11）上安装两只开关（10），开关（10）的上方设有开关按钮（9），在壳体（1）内还设有动滑连杆（8），动滑连杆（8）分别被置于壳体（1）的两边，并设有衬套（7），在滑动连杆（8）的中间设有动滑块（5），动滑块（5）的中间设有动滑凸起块（4），动滑块（5）设于两开关（10）的中间。

2、根据权利要求1所述的滑动式双开关，其特征在于动滑凸起块（4）可以拨动两开关（10）上方的开关按钮（9），动滑块（5）的两边还设有弹簧（6）。

3、根据权利要求1所述的滑动式双开关，其特征在于动滑块（5）上还设有定位螺丝（3），定位螺丝（3）暴露在防尘盖（2）外，其端部设有行程双开关拨手。

## 滑动式双开关

### 技术领域

本实用新型涉及一种开关，尤其是涉及一种滑动式双开关。

### 背景技术

电脑绣花机面板下面的长拉杆是由设于面板两边的开关启动，由于现在的电脑绣花机都是这样的设置，所以，要启动长位杆，必须打开两个开关，由于电脑绣花机已经从原来的6针发展到目前的16针，甚至已经发展到20多针，所以电脑绣花机的机身长度也在不断加长，长拉杆两端的开关距离也在增远，给安装以及电路的装置带来很大的不便。最为重要的是绣花机工作时拉杆给两端开关带来的撞击非常频繁，且撞击力非常大，所以常常出现开关坏死的故障，给绣花机带来整体上的质量影响。

### 发明内容

本实用新型的目的在于针对上述长拉杆的开关的问题，提供一种设计合理科学、安装和使用方便，无撞击力，采用自然柔和的拉力，启动开关连动拉杆一起，在一般的使用过程中无故障，从而更加稳固了拉杆开关以及绣花机的整体质量的，高、中、低多头绣花机均可使用的滑动式双开关。

为了达到上述目的，本实用新型主要是采用了以下技术方案来完成的。本实用新型主要由滑动式双开关的壳体及设于壳体上的开关所

组成,所述的壳体上设有防尘盖,在壳体内设有绝缘板,在绝缘板上安装两只开关,开关的上方设有开关按钮,在壳体内还设有动滑连杆,动滑连杆分别被置于壳体的两边,并设有衬套,在滑动连杆的中间设有动滑块,动滑块的中间设有凸起块,动滑块设于两开关的中间,动滑凸起块可以拨动两开关上方的开关按钮,动滑块的两边还设有弹簧,动滑块上还设有定位螺丝,定位螺丝暴露在防尘盖外,其端部设有行程双开关拨手。

本实用新型与现有技术相比,具有以下明显优点和创新。(1)本实用新型将两只开关装于一只滑动式双开关壳体上,缩短了两只开关的距离,安装起来相当方便。(2)无撞击力。(3)采用自然柔和的拉力启动开关。(4)一般使用无故障。(5)本实用新型性能可靠,成本节省。

本实用新型适用于电脑绣花机长拉杆的开关控制。

下面结合附图和具体实施方式对本实用新型作进一步详细的描述。

#### 附图说明

附图为本实用新型整体结构及局部剖示图。

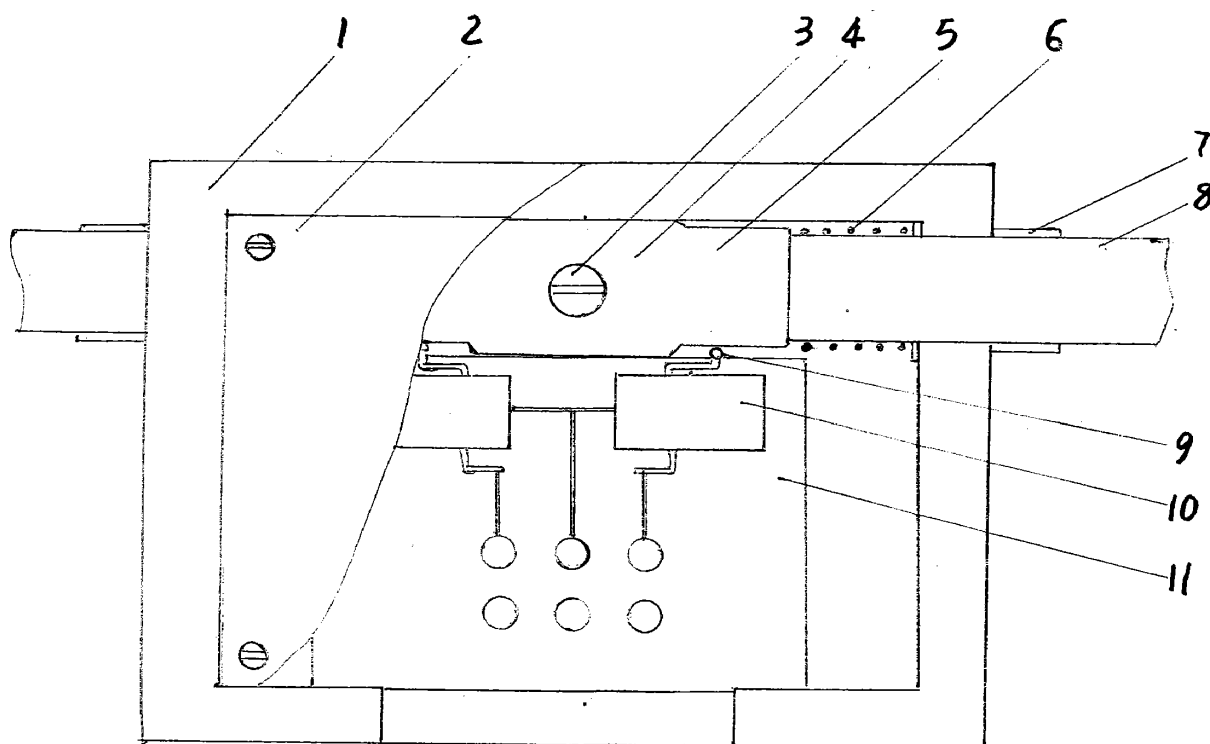
#### 具体实施方式

如图所示,本实用新型主要由滑动式双开关的壳体1及设于壳体1上的开关10所组成,所述的壳体1上设有防尘盖2,在壳体1内设有绝缘板11,在绝缘板11上安装两只开关10,开关10的上方设有开关按钮9,在壳体1内还设有动滑连杆8,动滑连杆8分别被置于



壳体 1 的两边，并设有衬套 7，在滑动连杆 8 的中间设有动滑块 5，动滑块 5 的中间设有凸起块 4，动滑块 5 设于两开关 10 的中间，动滑凸起块 4 可以拨动两开关 10 上方的开关按钮 9，动滑块 5 的两边还设有弹簧 6，动滑块 5 上还设有定位螺丝 3，定位螺丝 3 暴露在防尘盖 2 外，其端部设有行程双开关拨手。

本实用新型适用于电脑绣花机长拉杆的开关控制。



**English Abstract:**

The utility model relates to a slide type double switch which mainly consists of the shell of the slide type double switch and a switch arranged on the shell; the shell is provided with a dust-proof cover; an insulating board is arranged in the shell; two switches are arranged on the insulating board; a switch button is arranged above the switch; a dynamic slide connection rod is arranged in the shell; the dynamic slide connection rod is respectively arranged at the two sides of the shell and is provided with a bush; the middle of the slide connection rod is provided with a dynamic slide block; the middle of the dynamic slide block is provided with a convex block and is arranged between the two switches; the convex block of the dynamic slide block can trigger the switch button above the two switches; the two sides of the dynamic slide block are also provided with springs; a location screw is also arranged on the dynamic slide block; the location screw is exposed outside the dust-proof cover and the end part of the location screw is provided with a stroke double-switch triggering hand. The utility model is suitable for controlling the switch of the long tension rod of a computer embroidery machine.

**English Description:****TECHNICAL FIELD****Technical Field**

The utility model relates to a switch, in particular to a sliding type double switch.

**BACKGROUND ART****Background Art**

Computer controlled embroidery machine the underside of the panel is a long pull rod is composed of two sides of the panel switch to start, because the current computer controlled embroidery machine are such arrangement, therefore, to activate the long rod, two switch to open, because of the already from the original computer controlled embroidery machine 6 needle development to the present 16 needle, or even have already developed to 20 multi-pin, therefore, computer controlled embroidery machine extension in the length of the machine body, two ends of the long pull rod the distance [...], of the circuit to the installation and the inconvenience of the very large device. The most important work of the embroidery machine to pull rod is two-terminal switch of very frequent, and the impact force is very large, therefore, often switch necrosis fault, to the embroidery machine by the influence on the quality of on the whole.

**DISCLOSURE**

## Content of the invention

The purpose of the utility model is to address the above problem of the long pull rod of the switch, provides a reasonable and scientific design, convenient installation and use, without the impact force, the pulling force of the natural soft, together with starting switch linkage pull rod, in the process in the general use of the fault-free, thus more firmly the pull-rod switch and of the overall quality of the embroidery machine, high, middle, low can be used for multi-head embroidery machine sliding double switch.

In order to achieve the above-mentioned purpose, the utility model mainly adopts the following technical scheme to complete. The utility model is mainly composed of a sliding double switch housing and the switch on the shell, the shell is provided with a dust-proof cover, insulating plate is arranged within the housing, the insulating plate is provided with two switch, the push button of the switch is provided with a switch, the movable slide is also arranged in the shell connecting rod, the connecting rod are respectively provided with the two sides of the shell, and is provided with a bushing, the slide block is arranged in the middle of the connecting rod, the middle of the sliding block is provided with a protruding block, sliding block is located in the middle of the two switches, two sliding raised block can shift the switch button of the switch, the two sides of the sliding block is provided with a spring, the movable slide block is also provided with a positioning screw, a positioning screw is exposed outside the dust-proof cover, the end part is provided with a stroke double-switch handle.

Compared with the prior art, has the following obvious advantages and innovations. (1) the utility model the two switch a the only sliding type double switch housing, the switch only shorten the distance between the two, the installation is very convenient. (2) impact force-free. (3) natural soft the pulling force of the starting switch. (4) general use of non-fault. (5) the utility model is reliable in performance, the cost is saved.

The utility model is suitable for a computerized embroidery the pilot switch control of the pull rod.

The following Figures and embodiment with the utility model for further detailed description.

## Description of drawings

With photos to the whole structure of the utility model and local splits shows Figure.

## MODE FOR INVENTION

### Mode of execution

As shown, this utility model is mainly composed of a sliding double switch housing 1 and is arranged on the housing 1 on the switch 10 wherein, the shell 1 is provided with a dust-proof cover 2, in the housing 1 is provided with an insulating plate 11, on the insulating plate 11 is

provided with two switch 10, switch 10 is provided with the upper part of the switch according to a tortional 9, in the housing 1 is internally provided with a sliding connecting rod 8, the movable slide connecting rod 8 are respectively in the housing 1 of the two-side, and is provided with a bushing 7, the sliding connecting rod 8 is arranged in the middle of the sliding block 5, the movable slide block 5 is provided with a convex in the middle of the block 4, the movable slide block 5 is arranged on the two switch 10 in the middle of the, sliding raised block 4 the two switch can be toggled 10 the above switch according to the tortional 9, the movable slide block 5 is also provided with the two sides of the spring 6, the movable slide block 5 is also provided with a positioning screw 3, positioning screw 3 is exposed to the dust-proof cover 2 the outer, ends of the double switch handle is provided with a stroke.

The utility model is suitable for a computerized embroidery the pilot switch control of the pull rod.

**ENGLISH CLAIMS:**

1, a sliding type double switch, by sliding double switch housing (1) and the housing (1) on the switch (10) wherein, the shell (1) is provided with a dust-proof cover (2), characterized in that the shell (1) is provided with an insulating plate (11), on the insulation plate (11) is provided with two switch (10), the switch (10) is provided with a switch above according to the tortional (9), in the housing (1), wherein is also arranged inside the connecting rod (8), sliding the connecting rod (8) are respectively is arranged in the shell (1) the two sides of, and is provided with a bushing (7), the sliding connecting rod (8) is arranged in the middle of the sliding block (5), the movable slide block (5) is arranged in the middle of the sliding raised block (4), sliding block (5) is arranged on the two switches (10) intermediate.

2, sliding type double switch according to Claim 1, characterized in that sliding raised block (4) of the two switch can be toggled (10) the above switch according to the tortional (9), the movable slide block (5) is provided with a spring on both sides of (6).

3, sliding type double switch according to Claim 1, characterized in that the movable slide block (5) is also provided with a positioning screw (3), positioning screw (3) is exposed to the dust-proof cover (2) the outer, ends of the double switch handle is provided with a stroke.



(12) 实用新型专利

(10) 授权公告号 CN 201821663 U

(45) 授权公告日 2011.05.11

(21) 申请号 201020516324.8

(22) 申请日 2010.09.03

(73) 专利权人 南京德朔实业有限公司

地址 211106 江苏省南京市江宁经济技术开

发区将军大道 159 号

(72) 发明人 基思帕克 山冈敏成

(51) Int. Cl.

A01D 34/90(2006.01)

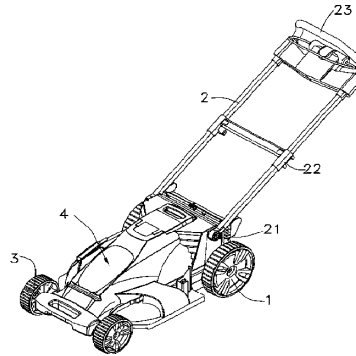
权利要求书 1 页 说明书 3 页 附图 6 页

(54) 实用新型名称

草坪维护设备

(57) 摘要

本实用新型提供一种草坪维护设备,包含:一切割装置,用于对草坪或植被的修割,一支撑装置,承载所述切割装置,一把手,具有一用于人手握持及移动所述草坪维护设备的握持部,其中:所述草坪维护设备具有一倾斜拖拉位置,在所述推拉位置上,至少一滚动元件被支撑在一支撑面上,一用于人手握持的推拉移动部相对所述支撑面具有一垂直距离及相对所述滚动元件与支撑面的接触处具有一倾斜距离,所述垂直距离与所述倾斜距离的比值范围为 0.5~1。本实用新型的草坪维护设备在倾斜拖拉位置上可轻松的将设备移动,作业更加便捷。



1. 一种草坪维护设备,包含:  
一切割装置,用于对草坪或植被的修割,  
一支撑装置,承载所述切割装置,  
一把手,具有一用于人手握持及移动所述草坪维护设备的握持部,

其特征在于:所述草坪维护设备具有一倾斜拖拉位置,在所述推拉位置上,至少一滚动元件被支撑在一支撑面上,一用于人手握持的推拉移动部相对所述支撑面具有第一垂直距离及相对所述滚动元件与支撑面的接触处具有第一倾斜距离,所述第一垂直距离与所述第一倾斜距离的比值范围为 0.5 ~ 1。

2. 根据权利要求 1 所述的草坪维护设备,其特征在于:所述第一垂直距离与所述第一倾斜距离的比值为 0.8。

3. 根据权利要求 1 或 2 所述的草坪维护设备,其特征在于:所述滚动元件包括设置在支撑装置后部的轮子。

4. 根据权利要求 1 或 2 所述的草坪维护设备,其特征在于:所述推拉移动部为所述把手处于折叠位置上时的握持部。

5. 根据权利要求 4 所述的草坪维护设备,其特征在于:所述草坪维护设备还具有使用位置及储存位置,在使用位置上,所述草坪维护设备相对支撑面具有第一正投影面积,在储存位置上,所述草坪维护设备相对支撑面具有第二正投影面积,所述第一正投影面积大于所述第二正投影面积。

6. 根据权利要求 5 所述的草坪维护设备,其特征在于:所述草坪维护设备还包括安装在所述支撑装置的前部的轮子,在所述使用位置上,所述前部的轮子和所述后部的轮子同时与支撑面接触,并且所述前部的轮子和所述后部的轮子之间具有第一距离。

7. 根据权利要求 6 所述的草坪维护设备,其特征在于:所述把手通过一枢转部可枢转地安装在所述支撑装置的后部,在所述储存位置上,所述枢转部和所述后部的轮子同时被支撑在支撑面上,并且所述枢转部到所述后部的轮子之间具有第二距离。

8. 根据权利要求 7 所述的草坪维护设备,其特征在于:所述第一距离大于所述第二距离。

9. 根据权利要求 6 所述的草坪维护设备,其特征在于:在所述储存位置上,所述后部的轮子及至少一辅助支撑同时被支撑在所述支撑面上,所述辅助支撑和所述后部的轮子之间具有第三距离。

10. 根据权利要求 9 所述的草坪维护设备,其特征在于:所述第一距离大于所述第三距离。

11. 根据权利要求 9 所述的草坪维护设备,其特征在于:所述辅助支撑与所述支撑装置为一体或所述辅助支撑为单独设置在支撑装置后部的支撑部。

12. 根据权利要求 7 所述的草坪维护设备,其特征在于:所述草坪维护设备还包括用于将把手进行枢转锁定的锁定机构。

13. 根据权利要求 12 所述的草坪维护设备,其特征在于:所述把手上还设有可伸缩及伸缩锁定机构。

## 草坪维护设备

### 技术领域

[0001] 本实用新型涉及一种草坪维护设备,特别是涉及一种在使用时可以用轮子支撑在草坪上移动的车式割草机。

### 背景技术

[0002] 在已知的草坪维护设备中,以车式割草机为例,包含一切割装置、一承载切割装置的底盘,底盘装在一具有四个轮子的框架上,框架的一端安有供作业时推动割草机本体移动的把手。

[0003] 目前用户在使用割草机时,从仓库到草坪的运输移动主要有两种方式:1. 割草机作业四轮触地后,水平推拉移动;2. 是将割草机抬离地面搬运。方式一对存储区域空间要求较大;方式二要求机器的重量足够轻。割草机从仓库到草坪的运输移动方式需要进一步改进。

### 发明内容

[0004] 针对上述现有技术存在的缺陷,本实用新型提供一种能够进行倾斜式推拉移动的草坪维护设备。

[0005] 为实现上述目的,本实用新型采用以下技术方案:

[0006] 一种草坪维护设备,包含:

[0007] 一切割装置,用于对草坪或植被的修割,

[0008] 一支撑装置,承载所述切割装置,

[0009] 一把手,具有一用于人手握持及移动所述草坪维护设备的握持部,

[0010] 其中:所述草坪维护设备具有一倾斜拖拉位置,在所述拖拉位置上,至少一滚动元件被支撑在一支撑面上,一用于人手握持的推拉移动部相对所述支撑面具有一垂直距离及相对所述滚动元件与支撑面的接触处具有一倾斜距离,所述垂直距离与所述倾斜距离的比值范围为 0.5 ~ 1。

[0011] 所述垂直距离与所述倾斜距离的比值为 0.8。

[0012] 所述滚动元件包括设置在支撑装置后部的轮子。

[0013] 所述推拉移动部为所述把手处于折叠位置上时的握持部。

[0014] 所述草坪维护设备还具有使用位置及储存位置,在使用位置上,所述草坪维护设备相对支撑面具有第一正投影面积,在储存位置上,所述草坪维护设备相对支撑面具有第二正投影面积,所述第一正投影面积大于所述第二正投影面积。

[0015] 所述草坪维护设备还包括安装在所述支撑装置的前部的轮子,在所述使用位置上,所述前部的轮子和所述后部的轮子同时与支撑面接触,并且所述前部的轮子和所述后部的轮子之间具有第一距离。

[0016] 所述把手通过一枢转部可枢转地安装在所述支撑装置的后部,在所述储存位置上,所述枢转部和所述后部的轮子同时被支撑在支撑面上,并且所述枢转部到所述后部的



轮子之间具有第二距离。

[0017] 所述第一距离大于所述第二距离。

[0018] 在所述储存位置上,所述后部的轮子及至少一辅助支撑同时被支撑在所述支撑面上,所述辅助支撑和所述后部的轮子之间具有第三距离。

[0019] 所述第一距离大于所述第三距离。

[0020] 所述辅助支撑与所述支撑装置为一整体或所述辅助支撑为单独设置在支撑装置后部的支撑部。

[0021] 所述草坪维护设备还包括用于将把手进行枢转锁定的锁定机构。

[0022] 所述把手上还设有可伸缩及伸缩锁定机构。

[0023] 通过采用以上技术方案,可实现以下有益技术效果:

[0024] 本实用新型的草坪维护设备在倾斜拖拉位置上可轻松的将设备移动,与抬离地面的搬运方式相比倾斜式推拉移动草坪维护设备使得人体只承受设备的部分重量,就可以实现草坪维护设备的转移,作业更加便捷。水平推拉方式需要先把把手装好,这要求仓库有足够的操作空间,与之比较倾斜式推拉可以更快的实现从仓库的移出动作,而把把手的组装工作转移到仓库以外的更广阔空间;在存储位置上的占地面积小于使用位置上的面积,可节省储存空间。

#### 附图说明

[0025] 图1是本实用新型的草坪维护设备的示意图;

[0026] 图2是处于使用的使用位置上的示意图;

[0027] 图3是处于储存的储存位置上的示意图;

[0028] 图4是处于储存的储存位置上的另一种实施方式示意图;

[0029] 图5是处于可倾斜移动的倾斜拖拉位置上的一种实施方式的示意图;

[0030] 图6为处于可倾斜移动的倾斜拖拉位置上的另一种实施方式示意图。

#### 具体实施方式

[0031] 下面结合附图对本实用新型的具体实施方式作进一步详细的说明。

[0032] 如图1所示,为本实用新型草坪维护设备的示意图,该草坪维护设备首选一种车式的割草机,包含:第一对轮子1及第二对轮子3,该第一对轮子1和第二对轮子3分别安装在一支撑装置4的后部和前部,该支撑装置4内承载有用于割草的切割装置(未示出),在支撑装置4的后部、第一对轮子1的上方安有一把手2,把手2通过枢转部21相对支撑装置4可枢转的安装,并且把手2可伸缩以及具有伸缩锁定结构22,把手2的最端部为用于人手握持的握持部23。

[0033] 如图2所示,为割草机在使用的使用位置时其状态图,当割草机在使用的时候,割草机的第一、第二对轮子1、3同时被支撑在支撑面5上,此时,如果光线从垂直于支撑面5的方向上射来,割草机的本体会在支撑面5上形成一个第一正投影面6,结合图3,为割草机在储存的储存位置上的示意图,当割草机实用完毕后将其储存时,为节省储存空间,使割草机处于大致直立状态,并且把手2被折叠起来,仅使第一对轮子1被支撑在支撑面5上,为增加稳固性,还可选用把手2的枢转部21也被支撑在支撑面5上,此时,如果光线从垂直于

支撑面 5 的方向上射来,割草机的本体会在支撑面 5 上形成一个第二正投影面 6',结合图 4,为割草机处于储存的储存位置上时,另一种存放的实施方式,此时,割草机仍处于大致的直立状态,第一对轮子 1 支撑在支撑面 5 上同时在支撑装置 4 上设有一支撑部 41 接触到支撑面 5 上,该支撑部 41 可与支撑装置 4 构造为一整体也可单独加设,同理,此时,如果光线从垂直于支撑面 5 的方向上射来,割草机的本体会在支撑面 5 上形成另一个第二正投影面 6"。由于,无论在使用的使用位置还是储存的储存位置上,割草机的宽度是相同的,对比图 2 及图 3,第一对轮子 1 与第二对轮子 3 之间的距离  $S1$  大于第一对轮子 1 到把手 2 支撑在支撑面 5 上的枢转部 21 之间的距离  $S2$ ,对比图 2 及图 4,第一对轮子 1 与第二对轮子 3 之间的距离  $S1$  大于第一对轮子 1 到支撑部 41 之间的距离  $S3$ ,因此,在使用的使用位置上的割草机的第一正投影 6 的面积大于在储存位置上的割草机的第二正投影 6'、6"的面积。

[0034] 如图 5 所示,为割草机在使用及储存位置之间状态变换时,割草机可倾斜移动的状态示意图,在该可倾斜移动的倾斜拖拉位置上,只有第一对轮子 1 与支撑面 5 接触,人手可握持在一推拉移动部上,该推拉移动部优选把手 2 的握持部位 23,此时,把手 2 处于折叠状态,握持部位 23 相对支撑面的垂直距离为  $H$ ,相对第一对轮子 1 与支撑面 5 的接触处的距离为  $L$ ,为适应人体工程学的需要,使操作者在推拉移动割草机时,只有较轻部分的割草机的重量由人体承受,本实用新型的  $H$  与  $L$  的比值范围为  $0.5 \sim 1$ ,更进一步优选的比值为  $0.8$ 。本领域技术人员很容易想到,推拉移动部也可以是其它的部位或构件,只要便于人手握持,可以设置在支撑装置 4 上等。

[0035] 如图 6 所示,为在倾斜拖拉位置上时的另一种实施方式示意图,整机的重量位于把手的上方,同时在支撑装置 4 的后部又设置一滚轮 42,把手的握持部 23 距支撑面 5 的距离  $H$  和到滚轮 42 与支撑面 5 之间的距离  $L$  的比值仍在  $0.5 \sim 1$ 。

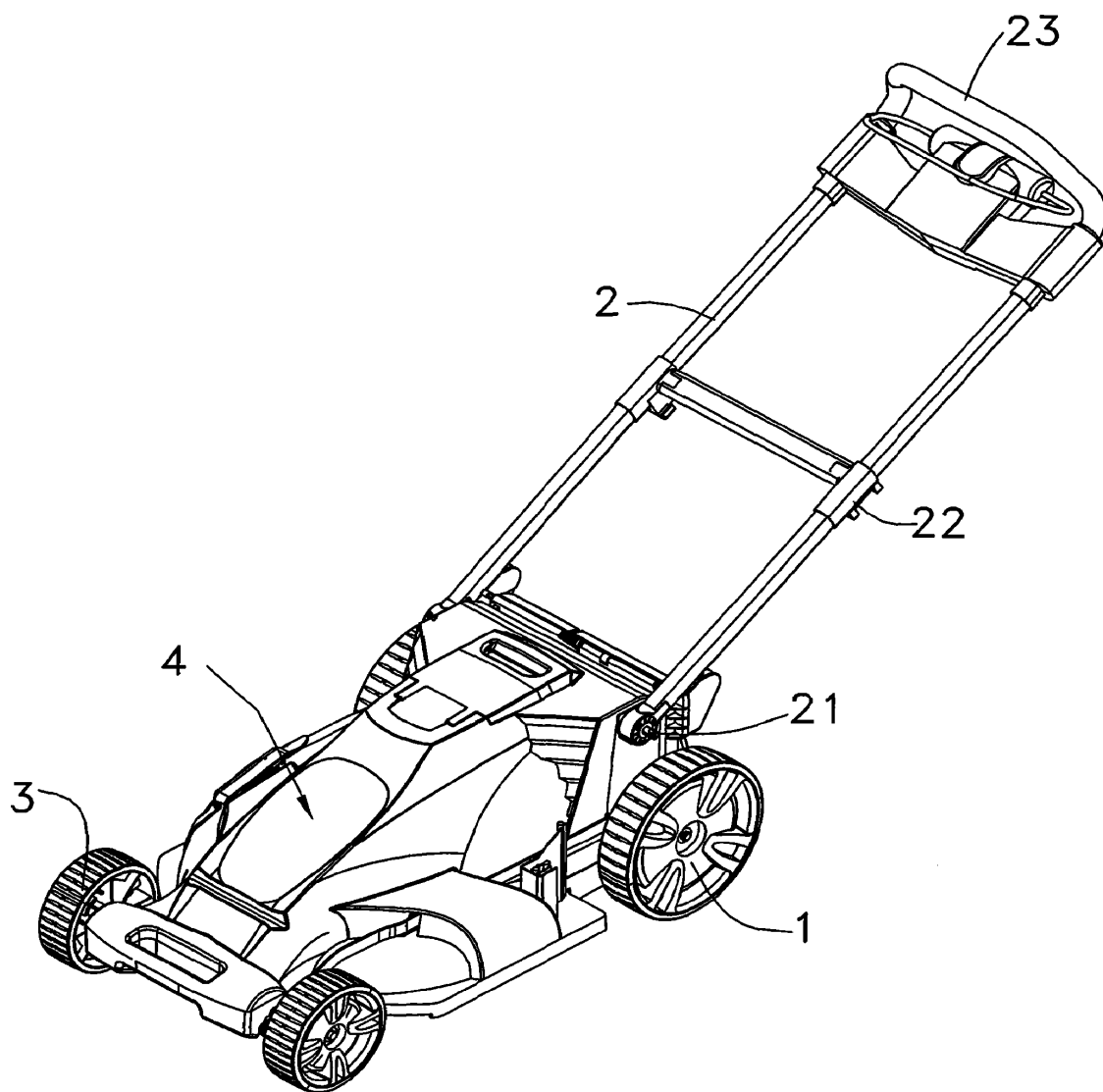


图 1

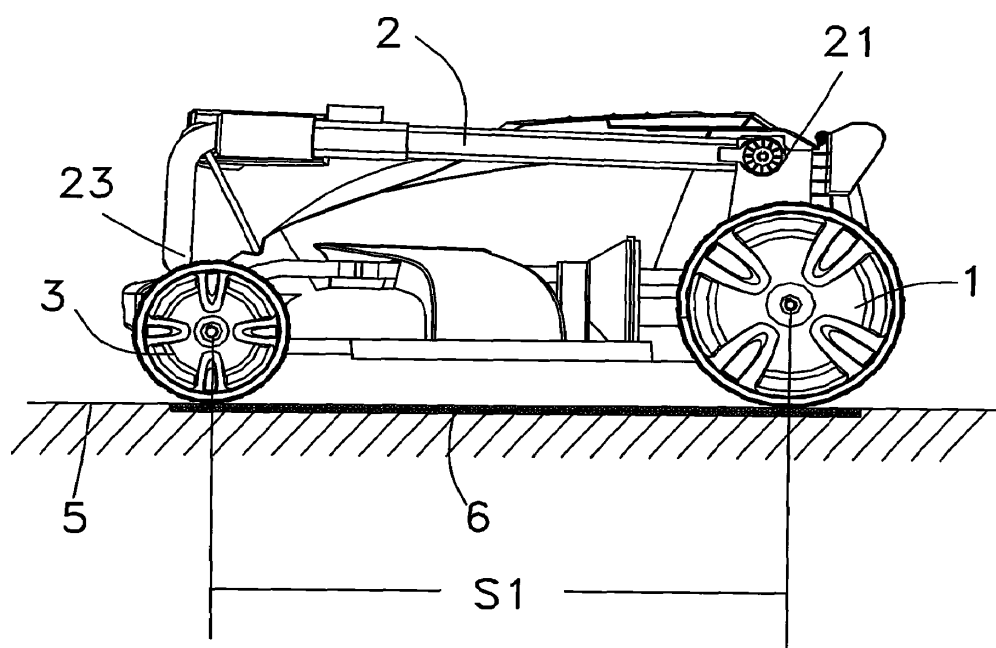


图 2

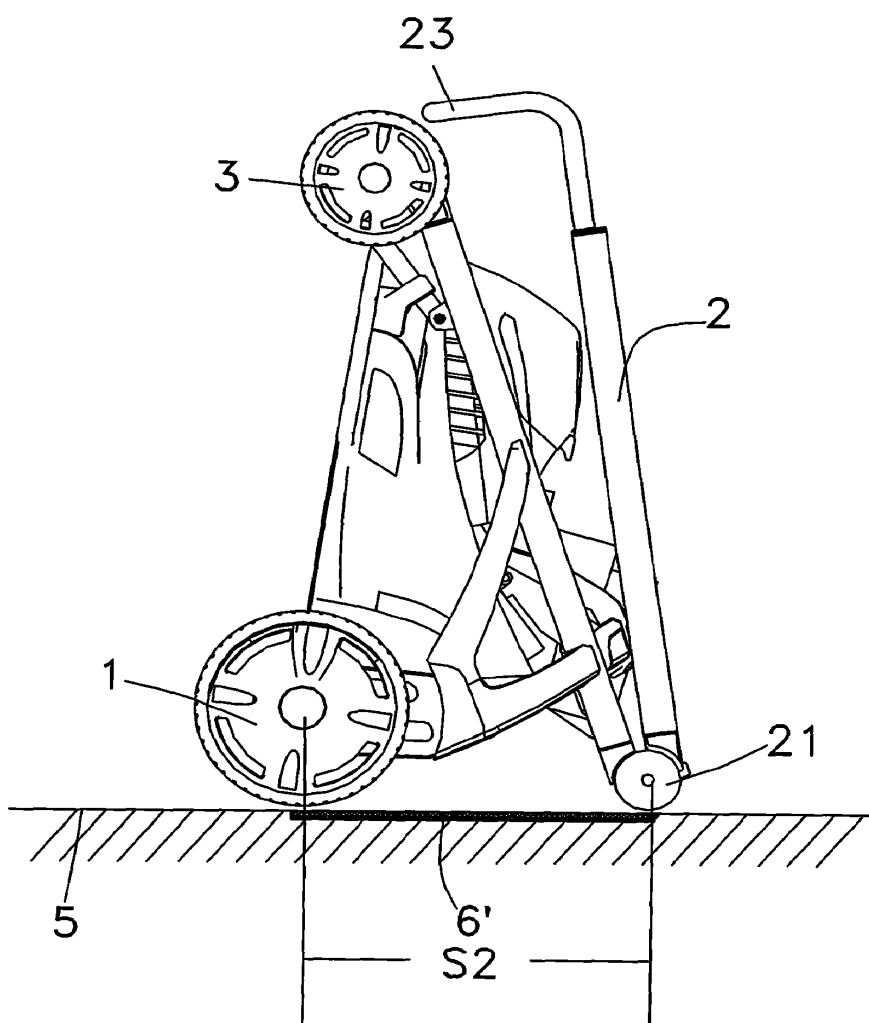


图 3

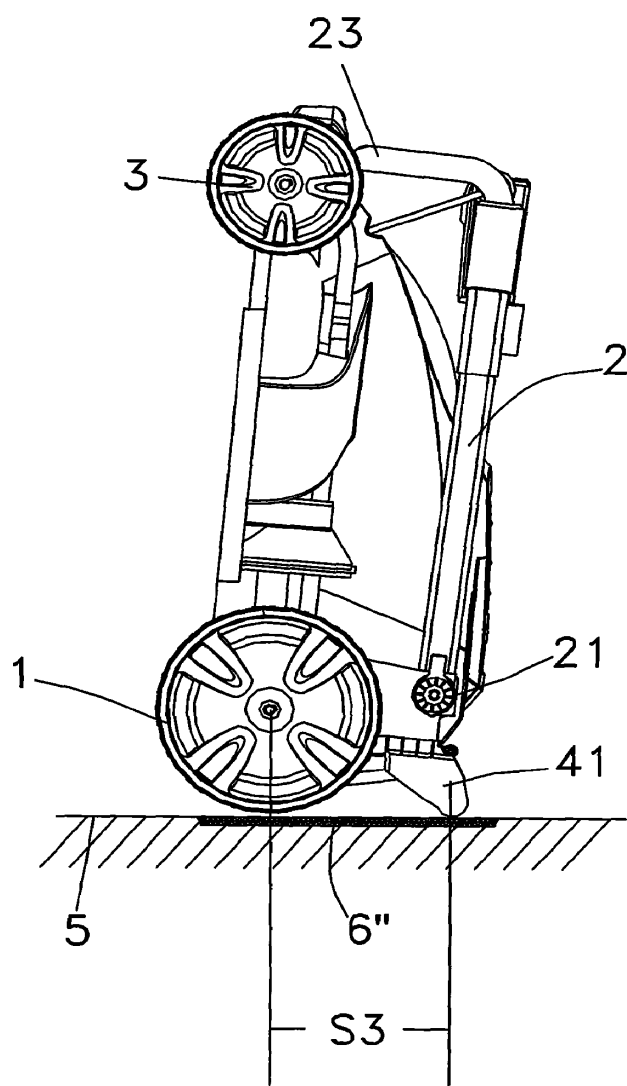


图 4

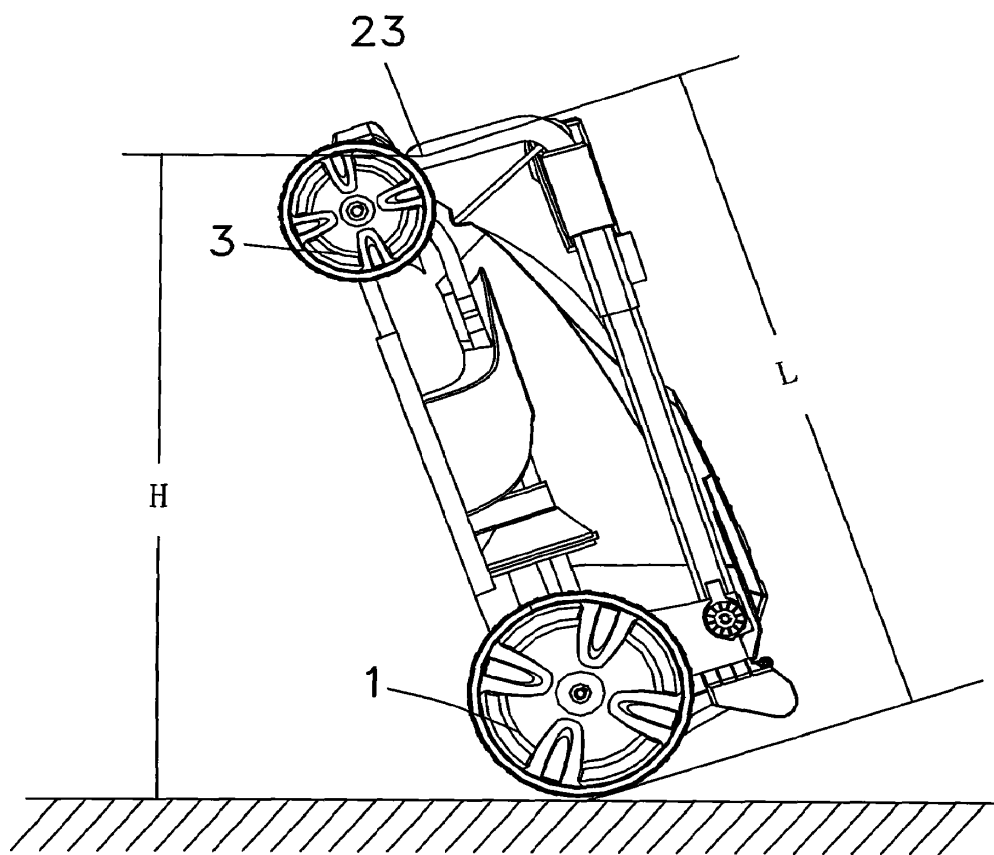


图 5

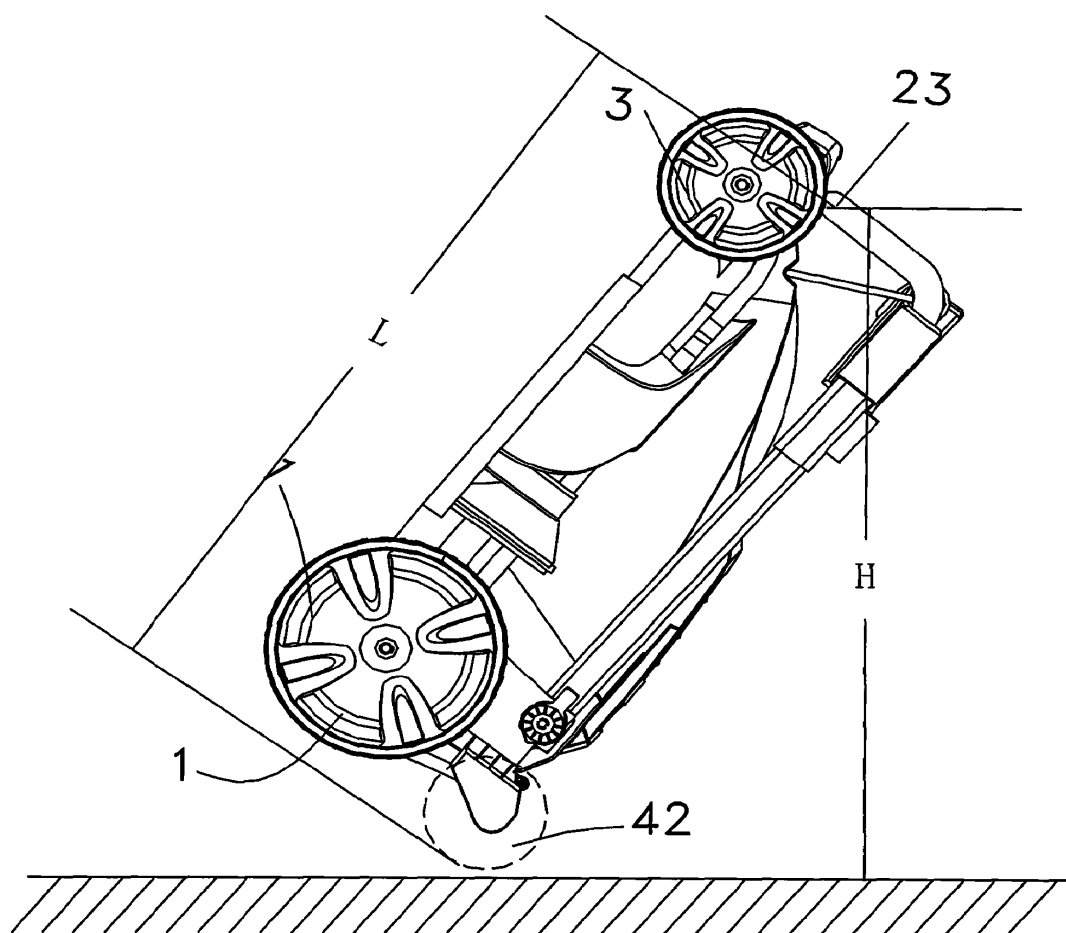


图 6



**English Abstract:**

The utility model provides lawn maintenance equipment. The lawn maintenance equipment comprises a cutting device used for shearing a lawn or vegetation, a support device used for bearing the cutting device, and a handle provided with a holding part capable of being held by hands for moving the lawn maintenance equipment; besides, the lawn maintenance equipment further comprises an inclined dragging position, wherein, in the push-pull position of the device, at least one rolling component is supported on a supporting surface; and a push-pull moving part for being held by hands has a vertical distance relative to the supporting surface and an incline distance relative to the contact part of the rolling component and the supporting surface, and the ratio of the vertical distance and the incline distance ranges from 0.5 to 1. The lawn maintenance equipment provided by the utility model can be moved easily at the inclined dragging position, so that the operation is more convenient.

**English Description:****Technical Field**

The utility model relates to a lawn maintenance equipment, in particular to a when in use, the support wheels can be used for the vehicle moving on the lawn mower.

**Background Art**

In the known lawn maintenance equipment, to vehicle type lawn mower, for example, comprise all cutting device, a bearing cutting device chassis, a chassis is mounted in a frame of the four wheels, one end of the frame is provided with a mower body for movement of the push handle.

The users in the use of the mower, the lawn from the warehouse to transport mobile mainly in two ways: 1. After four-wheel touchdown mower operation, horizontal push-and-pull movement; 2. The mower is lifted off the ground handling. A relatively large space requirement of the storage area; the second method requires sufficient light weight of the machine. From the warehouse to the lawn mower transport way of moving the need for further improvement.

**Content of the invention**

Against the above-mentioned the defects of the prior art, the present utility model provides a can be inclined push-and-pull movement of the lawn maintenance equipment.

In order to achieve the above-mentioned purpose, the utility model adopts the following technical scheme:

A lawn care apparatus, comprising:

A cutting unit, used for repairs shears of lawn or vegetation,

A support device, bearing the weight of the cutting device,

A handle, which is used for manual holding and moving the lawn maintenance equipment of the grip part,

Wherein: the lawn maintenance equipment has an inclined Tola position, in the push-on position, at least one rolling element is supported on a support surface, for a mobile part of the push-pull rod relative to the support face is provided with a vertical distance and relative to the rolling elements and the supporting surface has an inclined, and the contact part of the distance, the vertical distance the ratio of and the inclined distance in the range of 0.5-1.

The vertical distance and the inclined distance for a ratio of 0.8.

The rolling element includes is set up on the support device to the back of the wheel.

The push for moving the handle hand when in the folded position on the holding part.

The lawn maintenance equipment also has a use position and the storage position, is in the use position, the lawn maintenance equipment with 1st relative to the supporting surface of the projection area is, in the storage position, the lawn maintenance equipment is 2nd relative to the supporting surface of the projection area is, the 1st 2nd is larger than the projection area of the projection area is.

The lawn maintenance apparatus also includes the support device is installed in the front of the wheel, in the use position, the front wheel and the rear wheel at the same time contact with the bearing surface, and the front wheel and the rear of the with 1st distance between the wheels.

The handle by a pivot part is pivotally mounted in the rear part of the support device, on in the storage position, the states the pivot shaft to transfer and the rear wheel at the same time is supported on the supporting surface, and the rear of the the states the pivot shaft to transfer with 2nd distance between the wheels.

The distance is larger than the 1st 2nd distance.

In the storage position, the rear wheel and at least one auxiliary support at the same time is supported on the support surface, said auxiliary support and of the rear portion with 3rd distance between the wheels.

The distance is larger than the 1st 3rd distance.

The auxiliary support and the supporting device as a whole or the auxiliary support is singly

arranged in the supporting device the supporting part of the rear part.

The lawn maintenance apparatus also includes means for the handle the locking mechanism for locking the pivot.

The handle is also provided with a telescopic and retractable locking mechanism.

By adopting the above-mentioned technical scheme, the following beneficial technical effect can be achieved:

The utility model has the lawn maintenance apparatus on the inclined Tola position of the mobile device can be easily, and lifted off the ground compared with the conveying way inclined push-and-pull mobile lawn maintenance apparatus enables the human body only bears the weight of the part of the equipment, can realize the transfer of lawn maintenance equipment, operation is more convenient. Need to extend the horizontal pull-push mode, the handle is installed, this requires that the warehouse with sufficient operating space, compared with the inclined push-and-pull can be more quick removal of the realization of the action from the warehouse, and the assembling work of the handle is transferred to the warehouse space wider than ;, at the storing position of the floor area is smaller than the area of the location, the storage space can be saved.

#### Description of drawings

Figure 1 of the utility model is a schematic diagram of the lawn maintenance equipment;

Figure 2 is in the use of the schematic diagram of the in-use position;

Figure 3 is in the storage of a schematic diagram of the storage position;

Figure 4 is in the memory position to another embodiment of the schematic diagram;

Figure 5 is in the tiltable movement of the inclined Tola position of a schematic diagram of the embodiment;

Figure 6 in a tiltable movement of the other tilting Tola position a schematic diagram of the mode of execution.

#### Mode of execution

The following combination of the utility model the Figure Mode of execution for further detailed description.

As shown in Figure 1, to the utility model provides a lawn maintenance equipment of the schematic, the lawn maintenance equipment of a lawn mower of the preferred a vehicle,

comprising: the 1st wheel 1 and the 2nd wheel 3, the 1st to the wheel 1 and the 2nd wheel 3 are respectively mounted in a support device 4 and the rear part of the front, the support device 4 carried within a cutting device used for mowing (not shown), the supporting device 4 at the rear part of, the 1st wheel 1 has a handle the 2, the handle 2 through the pivot part 21 relative to the supporting device 4 is pivotally arranged, and the handle 2 telescopic with telescopic locking structure and 22, the handle 2 for the most end portion of the hand holding the grip part 23.

As shown in Figure 2, to the use position of the mower in use, the state diagram, when the lawn mower, when in use, of the lawn-mower 1st, 2nd pairs of wheels 1, 3 at the same time is supported on the supporting surface 5 is, at this moment, if the light from the perpendicular to the supporting surface 5 from the direction of, the body of the mower will be the support surface 5 is formed on projection a 1st 6, combined with Figure 3, as the lawn mower in the storage of the storage position of the schematic, when the mower utility after the time of storage the same, in order to save storage space, the mower is in roughly an upright state, and the handle 2 is folded, only the 1st to the wheel 1 is supported on the supporting surface 5 is, in order to increase the stability, also can choose the handle 2 of the film 21 also is supported on the supporting surface 5 is, at this moment, if the light from the perpendicular to the supporting surface 5 from the direction of, the body of the mower will be the support surface 5 is formed on projection a 2nd the 6 [...], combined with Figure 4, the mower is in the memory position, the other embodiment of a storage, at this moment, lawn mower is still in a substantially vertical state, the 1st wheel 1 is supported on the supporting surface 5 at the same time on the support device 4 is provided with a supporting portion 41 in contact with the supporting surface 5 is, the supporting part 41 with a supporting device 4 structure as a whole can also be added separately, by the same token, at this moment, if the light from the perpendicular to the supporting surface 5 from the direction of, the body of the mower will be the support surface 5 is formed on projection another 2nd is the 6 [...]. Since, regardless of the use or storage of the use position of the upper storage position, the width of the lawn mower is the same, compared to Figure 2 and Figure 3, the 1st wheel 1 and the 2nd to the wheel 3 of the distance between the S1 is larger than the 1st wheel 1 to the handle 2 and supported on the supporting surface 5 of the pivot part 21 the distance between S2, compared to Figure 2 and Figure 4, the 1st wheel 1 and the 2nd to the wheel 3 of the distance between the S1 is larger than the 1st wheel 1 to the support portion 41 the distance between the S3, therefore, the use of the in use position of the lawn-mower is 1st on the projection 6 in the memory position larger than the area of the of the 2nd orthographic projection of a lawn mower of the 6 [...], 6 the area of [...].

As shown in Figure 5, and in use the mower state conversion between the storage position, mower can be used to tilt moving state schematic, the mobile can be inclined on the inclined Tola position, only 1st to the wheel 1 and the supporting surface 5 contact, the manpower can be held on a push-pull movement, the push-and-pull mobile part can preferably the handle 2 of the holding part 23, at this moment, the handle 2 is in a folded state, the holding part 23 relative to the supporting surface for the vertical distance H, 1st opposite the wheel 1 and the supporting surface 5 of the contact point of the distance L, in order to adapt to the needs of the human engineering, push-and-pull movement of the mower when the operator, only minor part of the human body to bear the weight of the mower, the utility model of the ratio of the H and L in the

range of 0.5-1, more preferably in one step to a ratio of 0.8. The technicians of this field can be easily thought of, push-and-pull moving part can also be other part or component, as long as convenient hand holding, can be arranged on the supporting device 4 and the like.

As shown in Figure 6, the inclined Tola position to another the embodiment schematically, the weight of the complete machine is located in the upper part of the handle, at the same time the supporting device 4 and the rear part of the provided with a roller 42, gripping portion of the handle 23 from the supporting surface 5 and H to the distance between the roller 42 and the supporting surface 5 the ratio of the distance between the L 0.5-1.

**ENGLISH CLAIMS:**

1. A lawn care apparatus, comprising:

A cutting unit, used for repairs shears of lawn or vegetation,

A support device, bearing the weight of the cutting device,

A handle, which is used for manual holding and moving the lawn maintenance equipment of the grip part,

Characterized in that the lawn maintenance equipment has an inclined Tola position, in the push-on position, at least one rolling element is supported on a support surface, for a mobile part of the push-pull rod relative to the support face is provided with a vertical distance and relative to the rolling elements and the supporting surface has an inclined, and the contact part of the distance, the vertical distance the ratio of and the inclined distance in the range of 0.5-1.

2. Lawn maintenance equipment according to Claim 1, characterized in that the vertical distance and the inclined distance for a ratio of 0.8.

3. Lawn maintenance equipment as in Claim 1 or Claim 2, characterized in that the rolling element includes is set up on the support device at the back of the wheel.

4. Lawn maintenance equipment as in Claim 1 or Claim 2, characterized in that the push-in movement of the handle when the handle is in the folding position of the holding part.

5. Lawn maintenance equipment according to Claim 4, characterized in that said lawn maintenance equipment also has a use position and the storage position, is in the use position, the lawn maintenance equipment with 1st relative to the supporting surface of the projection area is, in the storage position, the lawn maintenance equipment is 2nd relative to the supporting surface of the projection area is, the 1st 2nd is larger than the projection area of the projection area is.

6. Lawn maintenance equipment according to Claim 5, characterized in that the lawn maintenance apparatus also includes the support device is installed in the front of the wheel, in the use position, the front wheel and the rear wheel at the same time contact with the bearing surface, and the front wheel and the rear of the with 1st distance between the wheels.

7. Lawn maintenance equipment according to Claim 6, characterized in that the handle by a pivot part is pivotally mounted in the rear part of the support device, on in the storage position, the states the pivot shaft to transfer and the rear wheel at the same time is supported on the supporting surface, and the rear of the the states the pivot shaft to transfer with 2nd distance between the wheels.

8. Lawn maintenance equipment according to Claim 7, characterized in that the distance is larger than the 1st 2nd distance.

9. Lawn maintenance equipment according to Claim 6, characterized in that in the storage position, the rear wheel and at least one auxiliary support at the same time is supported on the support surface, said auxiliary support and of the rear portion with 3rd distance between the wheels.

10. Lawn maintenance equipment according to Claim 9, characterized in that the distance is larger than the 1st 3rd distance.

11. Lawn maintenance equipment according to Claim 9, characterized in that said auxiliary support and the supporting device as a whole or the auxiliary support is singly arranged in the supporting device the supporting part of the rear part.

12. Lawn maintenance equipment according to Claim 7, characterized in that the lawn maintenance apparatus also includes means for the handle the locking mechanism for locking the pivot.

13. Lawn maintenance equipment according to Claim 12, characterized in that the handle is also provided with a telescopic and retractable locking mechanism.



## (12) 实用新型专利

(10) 授权公告号 CN 202873363 U

(45) 授权公告日 2013. 04. 17

(21) 申请号 201220524069. 0

(ESM) 同样的发明创造已同日申请发明专利

(22) 申请日 2012. 10. 15

(73) 专利权人 南京德朔实业有限公司

地址 211106 江苏省南京市江宁经济技术开  
发区将军大道 159 号

(72) 发明人 山冈敏成 聂方杰 许海深  
邵贤典

(74) 专利代理机构 南京纵横知识产权代理有限  
公司 32224

代理人 董建林

(51) Int. Cl.

A01D 75/18(2006. 01)

A01D 34/00(2006. 01)

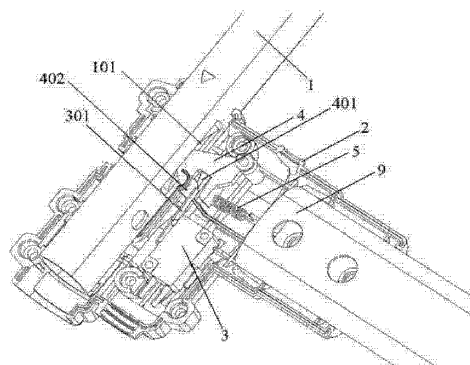
权利要求书 1 页 说明书 4 页 附图 4 页

### (54) 实用新型名称

具有操作保护的割草机及其安全开关机构

### (57) 摘要

本实用新型公开了一种具有操作保护的割草机及其安全开关机构,其中安全开关机构,包括:通过套接构成滑动连接的内管和管套件、安装在上述管套件内的带有接触弹片的安全开关、用于在上述内管滑动时通过接触上述接触弹片而触发安全开关的触发件、用于驱使上述触发件保持不接触上述接触弹片状态的弹性件;上述安全开关、触发件和弹性件均位于上述内管的同侧;本实用新型的割草机在包括安全开关机构的基础上还包括:主机体和与之转动连接的中空的一级把手杆,上述主机体设有马达和控制马达的控制电路,上述管套件设置在上述一级把手杆的端头处,安全开关机构能够保证操作者的安全,在使用者意外靠近主机体时,马达自动关机,降低发生意外的可能性。



1. 适用于滑动触发的安全开关机构,包括:彼此能够相对滑动的内管和管套件,其特征在于,还包括:安装在上述管套件内的安全开关组件;上述内管设有安全挡位结构,上述安全开关组件包括:安全开关、在上述内管的安全挡位结构脱离安全位置时触发安全开关并在安全挡位结构回到安全位置时复位的触发组件。

2. 根据权利要求1所述的适用于滑动触发的安全开关机构,其特征在于,上述触发组件包括:一端与上述安全开关固定连接的在没有外力作用下能自动复位的接触弹片;上述接触弹片的另一端为用于与上述内管接触的自由端。

3. 根据权利要求2所述的适用于滑动触发的安全开关机构,其特征在于,上述安全挡位结构为用于容纳放松状态下的上述接触弹片的自由端的容纳槽。

4. 根据权利要求1所述的适用于滑动触发的安全开关机构,其特征在于,上述触发组件还包括:一端与上述安全开关固定连接的在没有外力作用下能自动复位的接触弹片、用于在上述内管滑动时与上述内管接触从而压迫上述接触弹片触发上述安全开关的触发件、用于驱使上述触发件保持不触发上述安全开关的状态的复位件;上述接触弹片的另一端为用于与上述触发件接触配合的自由端。

5. 根据权利要求4所述的适用于滑动触发的安全开关机构,其特征在于,上述安全挡位结构为用于容纳上述触发件的容纳槽。

6. 根据权利要求5所述的适用于滑动触发的安全开关机构,其特征在于,上述安全开关、触发件和复位件均位于上述内管的同侧;上述触发件位于上述内管和复位件之间。

7. 根据权利要求5所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件形成有用于容纳和接触上述接触弹片的缺口槽;上述缺口槽靠近上述内管的一侧形成有弧形的接触面。

8. 根据权利要求5至7任意一项所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件与上述管套件构成转动连接。

9. 根据权利要求8所述的适用于滑动触发的安全开关机构,其特征在于,上述复位件为具有弹性的依靠弹性能量实现复位的弹性件,上述弹性件为一端与上述管套件固定连接另一端顶住上述触发件的螺旋弹簧或设置在触发件转轴处的扭力弹簧。

10. 根据权利要求9所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件与上述管套件构成转动连接的转动轴线垂直于上述内管与管套件滑动连接的方向。

11. 根据权利要求10所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件形成有用于与上述内管接触的圆滑的端部。

12. 具有操作保护的割草机,包括:主机体和与之转动连接的中空的一级把手杆,上述主机体设有马达和与之电连接用于控制的控制器,其特征在于,还包括:如权利要求1至11任意一项所述的适用于滑动触发的安全开关机构,上述管套件设置在上述一级把手杆的端头处,上述内管通过上述管套件嵌入上述一级把手杆内部与之构成滑动连接,上述安全开关与上述控制器构成电连接。



## 具有操作保护的割草机及其安全开关机构

### 技术领域

[0001] 本实用新型涉及一种割草机及其安全保护装置,具体涉及一种具有操作保护的割草机及其安全开关机构。

### 背景技术

[0002] 割草机是一种用于平整草坪的工具,其主要通过主机体的马达带动刀片实现对长的草叶的剪切,为了实现高效率的割草,割草机的马达功率比较大,因此其对操作者的人身安全也有一定隐患,现在一般通过较长的把手杆使操作者尽可能远离主机体,避免发生危险,但是为了能够方便收纳割草机,把手杆往往分为可伸缩两段,这就有可能在操作时把手杆意外收缩,导致使用者双手靠近主机体,发生危险。

### 实用新型内容

[0003] 为解决现有技术的不足,本实用新型的目的在于提供一种能够在把手发生意外收缩时及时停机的安全开关机构及具有该安全开关机构的割草机。

[0004] 为了实现上述目标,本实用新型采用如下的技术方案:

[0005] 适用于滑动触发的安全开关机构,包括:彼此能够相对滑动的内管和管套件,安装在管套件内的安全开关组件;内管设有安全挡位结构,安全开关组件包括:安全开关、在内管的安全挡位结构脱离安全位置时触发安全开关并在安全挡位结构回到安全位置时复位的触发组件。

[0006] 具体而言,作为一种简单的方案,触发组件包括:一端与安全开关固定连接的在没有外力作用下能自动复位的接触弹片;接触弹片的另一端为用于与内管接触的自由端。安全挡位结构为用于容纳放松状态下的接触弹片的自由端的容纳槽。

[0007] 作为一种可靠性较高的方案,触发组件还包括:一端与安全开关固定连接的在没有外力作用下能自动复位的接触弹片、用于在内管滑动时与内管接触从而压迫接触弹片触发安全开关的触发件、用于驱使触发件保持不触发安全开关的状态的复位件;接触弹片的另一端为用于与触发件接触配合的自由端。此时安全挡位结构为用于容纳触发件的容纳槽。

[0008] 具体而言,安全开关、触发件和复位件均位于内管的同侧;触发件位于内管和复位件之间。触发件形成有用于容纳和接触接触弹片的缺口槽;缺口槽靠近内管的一侧形成有弧形的接触面。触发件与管套件构成转动连接。

[0009] 特别地,复位件为具有弹性的依靠弹性能量实现复位的弹性件,弹性件为一端与管套件固定连接另一端顶住触发件的螺旋弹簧或设置在触发件转轴处的扭力弹簧。

[0010] 进一步的,触发件与管套件构成转动连接的转动轴线垂直于内管与管套件滑动连接的方向。触发件形成有用于与内管接触的圆滑的端部。

[0011] 本实用新型的具有操作保护的割草机,包括:主机体和与之转动连接的中空的一级把手杆,主机体设有马达和与之电连接用于控制的控制器以及前述方案中的安全开关机

构,管套件设置在一级把手杆的端头处,内管通过管套件嵌入一级把手杆内部与之构成滑动连接,安全开关与控制器构成电连接。

[0012] 本实用新型的有益之处在于:通过设置安全开关机构能够保证操作者的安全,在发生使用者意外靠近主机体时,马达自动关机,降低发生意外的可能性。

#### 附图说明

[0013] 图 1 是本实用新型的适用于滑动触发的安全开关机构的一个优选实施例的结构示意图;

[0014] 图 2 是本实用新型的适用于滑动触发的安全开关机构的另一个优选实施例的结构示意图;

[0015] 图 3 是本实用新型的割草机的一个优选实施例的结构示意图;

[0016] 图 4 是本实用新型的割草机一个优选实施例的电路框图。

[0017] 图中附图标记的含义:

[0018] 1- 内管,101- 容纳槽;2- 管套件;3- 安全开关,301- 接触弹片;4- 触发件,401- 缺口槽,402- 接触面;5- 弹性件;6- 主机体;7- 一级把手杆;8- 操作把手。

#### 具体实施方式

[0019] 以下结合附图和具体实施例对本实用新型作具体的介绍。

[0020] 参照图 1 和图 2 所示,本实用新型的适用于滑动触发的安全开关机构主要包括:内管 1、管套件 2 和安全开关组件。其中,安全开关组件包括:安全开关 3 和用于触发安全开关 3 的触发组件。安全开关 3 和触发组件是设置在管套件 2 内部的。总的来说,触发组件作用在于在内管的安全挡位结构脱离安全位置时触发安全开关并在安全挡位结构回到安全位置时复位。

[0021] 参照图 1 所示的实施例,作为一种简洁的技术方案,触发组件包括:接触弹片 301,接触弹片 301 的一端与安全开关 3 构成连接,另一端为自由端,在内管 1 滑动时,内管 1 的管壁对接触弹片 301 构成压迫,使其触发安全开关 3,接触弹片 301 本身具有一定的弹性,当内管 1 滑动使作为安全挡位结构的容纳槽 101 至安全位置时,接触弹片 301 由于不受到外力的作用复位,对安全开关 3 不构成触发。内管 1 上的安全挡位结构为用于容纳放松状态下的接触弹片 301 的自由端的容纳槽 101。

[0022] 这种技术方案,依赖接触弹片 301 自身的弹性,可能会出现由于使用频繁而造成失效。

[0023] 参照图 2 所示的实施例,本实用新型提供了一种更为可靠的优选方案,触发组件主要包括:触发件 4、弹性件 5;安全开关 3、触发件 4 和弹性件 5 均位于内管 1 的同侧。内管 1 上的安全挡位结构为用于容纳触发件 4 容纳槽 101。

[0024] 其中,内管 1 与管套件 2 构成滑动连接,管套件 2 套接在内管 1 的外围,内管 1 的尺寸较长,能够穿过管套件 2 并在其中滑动。安全开关 3 设置在套管件 2 的内部,安全开关 3 与管套件 2 构成固定连接,接触弹片 301 一端与安全开关 3 固定连接,另一端为自由端,开关主体上还设有一个触点,当接触弹片 301 的自由端被压迫时,即能通过接触压迫触点实现通断的控制。当然,用于实现触发安全开关的机械结构也可以是其他结构,只要能实现

在压迫时接触触点,放松时脱离触点即可,另一种较为可行的方案为,在触点外侧设置一螺旋弹簧,触点位于螺旋弹簧中,螺旋弹簧的一端与安全开关的开关主体固定,另一端为自由端,设有一个接触板,类似于此的方案较多,在此不加赘述。

[0025] 触发件 4 安装在管套件 2 内部,其主要作用在于在内管 1 与管套件 2 的相对滑动时作为桥梁将能量传递到接触弹片 301 的自由端,实现触发。作为优选方案,触发件 4 与管套件 2 构成转动连接,转动轴线垂直于内管 1 与管套件 2 滑动连接的方向。这样一来,触发件 4 通过转动可以接触或远离接触弹片 301。

[0026] 在一般情况下,我们希望内管 1 相对管套件 2 具有一个正常的工作位置,也就是说在这个位置时,我们不希望触发件 4 受到内管 1 的作用触发安全开关 3,但是一旦内管 1 滑动出这个位置的范围,即能通过接触使触发件 4 动作。而复位件的作用在于在内管 1 重新滑回工作位置的范围时,复位件能够复位不再触发安全开关 3。复位件的实质是一个蓄能构件,即其能将触发件 4 被外力压迫的能量转化为自身的能量,在外力撤销之后,将能量释放使触发件 4 复位。根据这样的特点,复位件可以采用磁性构件或弹性构件得以实现,因为它们均具有蓄能的特点。出于简化结构的考虑,复位件为具有弹性的依靠弹性能量实现复位的弹性件 5。

[0027] 作为优选,弹性件 5 为一端与管套件 2 固定连接另一端顶住触发件 4 的螺旋弹簧或设置在触发件 4 转轴处的扭力弹簧。

[0028] 作为一种优选方案,为了实现前述的工作位置,内管 1 朝向触发件 4 的一侧设有用于容纳上述触发件 4 的容纳槽 101。触发件 4 的朝向内管 1 的端部在容纳槽 101 的范围之内时,在弹性件 5 的驱动下,触发件 4 不触发安全开关 3,处于正常工作的状态,当发生意外或误操作时,内管 1 与管套件 2 相对滑动(向使用者靠近主机体的方向),触发件 4 的端部与容纳槽 101 错位,内管 1 的管壁将压迫触发件 4 转动,使之与接触弹片 301 接触,实现触发安全开关 3。当然这只是本实用新型一个技术方案,还可以采用其他方案实现,只要能够实现在工作位置时,触发件 4 不受到压迫具有足够空间,在其他位置时,触发件 4 受到压迫即可。

[0029] 为了能够便于触发件 4 和容纳槽 101 的通过转动滑进滑出,触发件 4 形成有用于与内管 1 接触的圆滑的端部,相应的容纳槽 101 也是一个弧形的槽。

[0030] 作为优选方案,为了使触发件 4 与接触弹片 301 的接触更为可靠,触发件 4 形成有用于容纳和接触上述接触弹片 301 的缺口槽 401,这个容纳和接触主要指的是对接触弹片 301 的自由端的容纳和接触。缺口槽 401 靠近内管 1 的一侧形成有弧形的接触面 402,这个弧形接触面 402 的面积相比接触弹片 301 的自由端要大的很多,能够很好地保证触发的可靠性。

[0031] 参照图 3 和图 4 所示,本实用新型的割草机包括:主机体 6、一级把手杆 7 以及前述的本实用新型的安全开关机构,其中,主机体 6 设有马达、控制马达的控制电路以及刀片等,是实现割草机工作能的主要部分,一级把手杆 7 与主机体 6 转动连接作为主要可伸缩把手的第一级,它内部中空可以容纳本实用新型的安全开关机构中的内管 1,实际上内管 1 与管套件 2 的相对滑动连接,也是内管 1 与一级把手杆 7 滑动连接,管套件 2 与一级把手杆 7 固定连接实现的,管套件 2 设置在一级把手杆 7 的端头处,这个端头指的是一级把手杆 7 的自由端,内管 1 通过管套件 2 嵌入一级把手杆 7 内部与之构成滑动连接,内管 1 的自由端可

以设置操作把手 8,安全开关与控制器构成电连接,控制器与马达又构成电连接,从而实现安全开关能够控制马达的工作。

[0032] 参照图 2 所示,当内管 1 意外收缩到一级把手杆 7 时,使用者可能会因为正在操作操作把手 8 而过于接近主机体 6 从而造成危险,此时安全开关 3 被触发,马达停机,降低了使用者发生危险的可能性。

[0033] 以上显示和描述了本实用新型的基本原理、主要特征和优点。本行业的技术人员应该了解,上述实施例不以任何形式限制本实用新型,凡采用等同替换或等效变换的方式所获得的技术方案,均落在本实用新型的保护范围内。

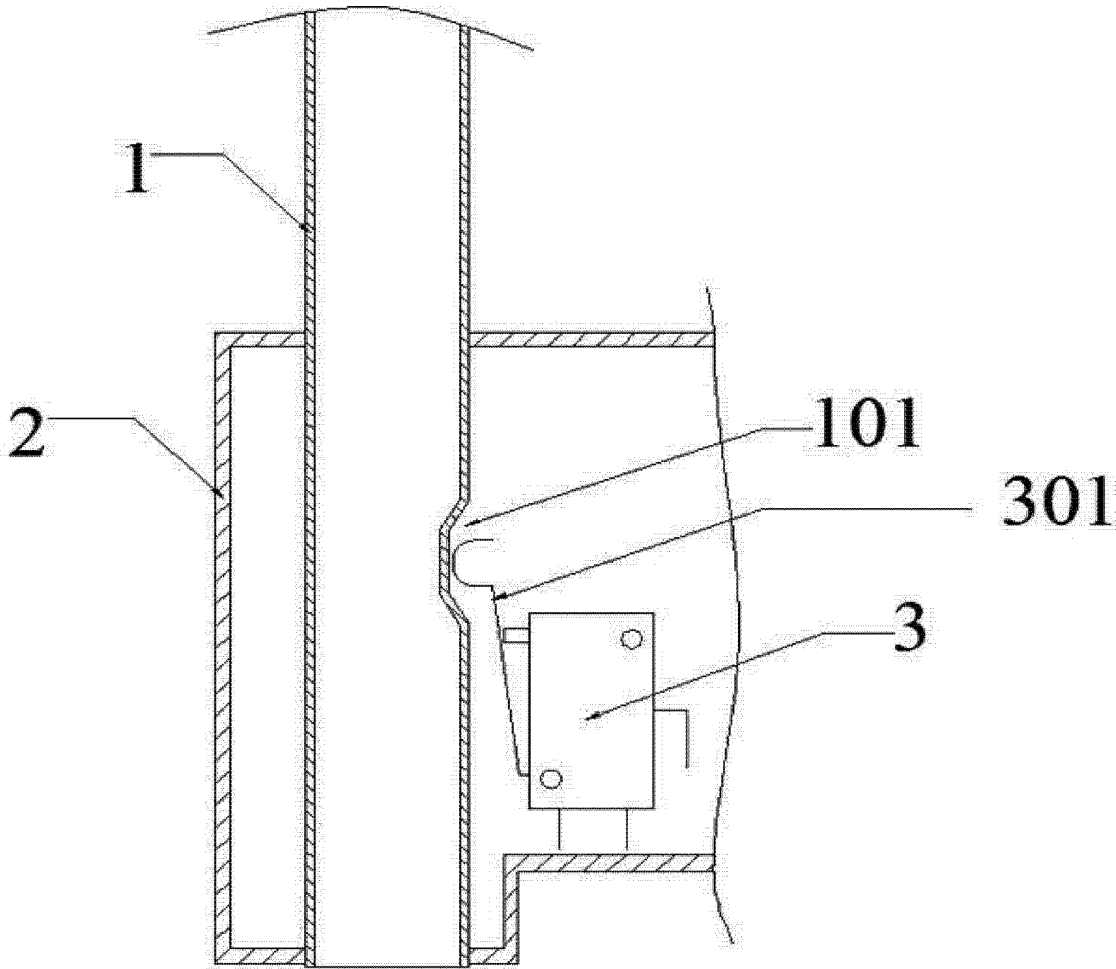


图 1

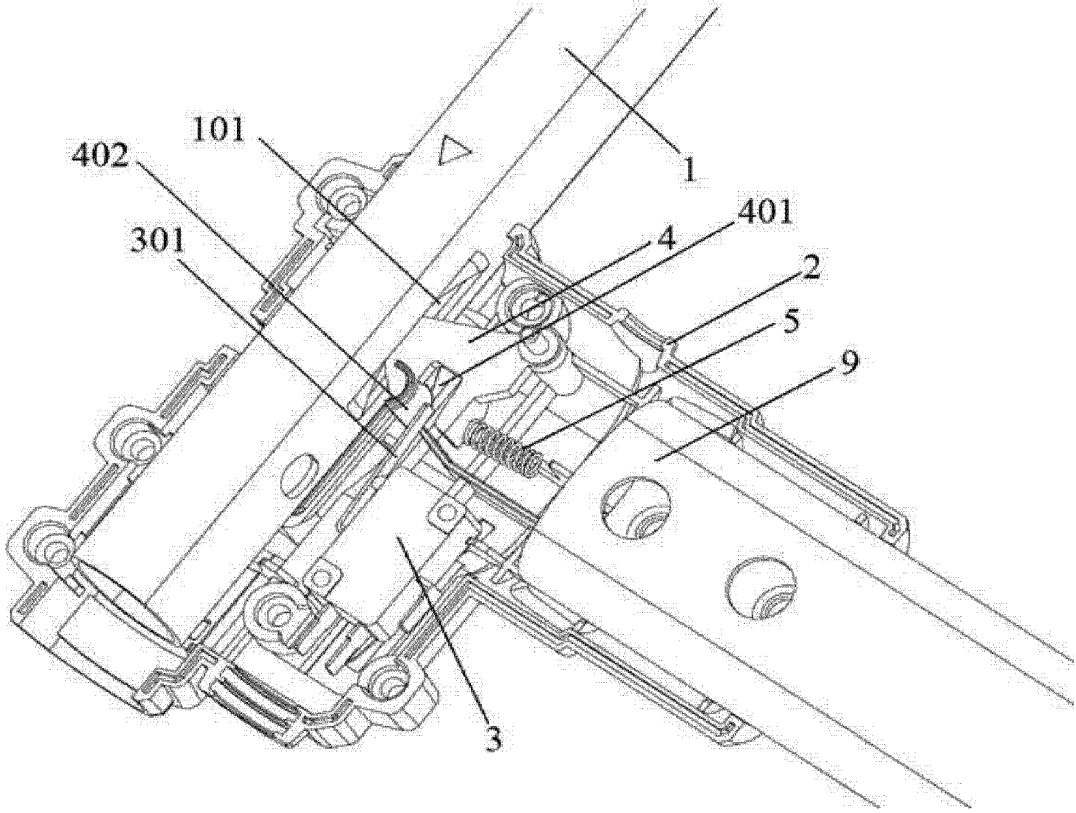


图 2

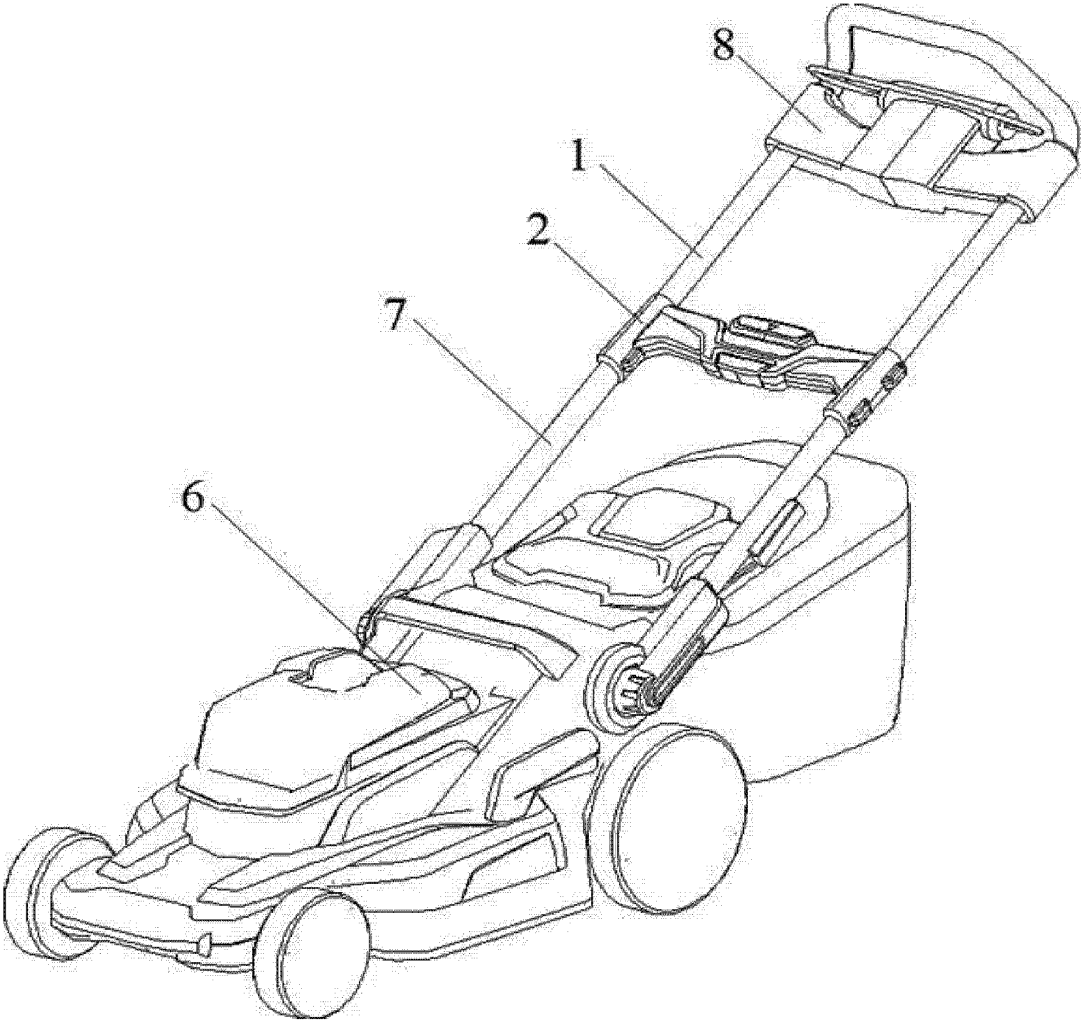


图 3

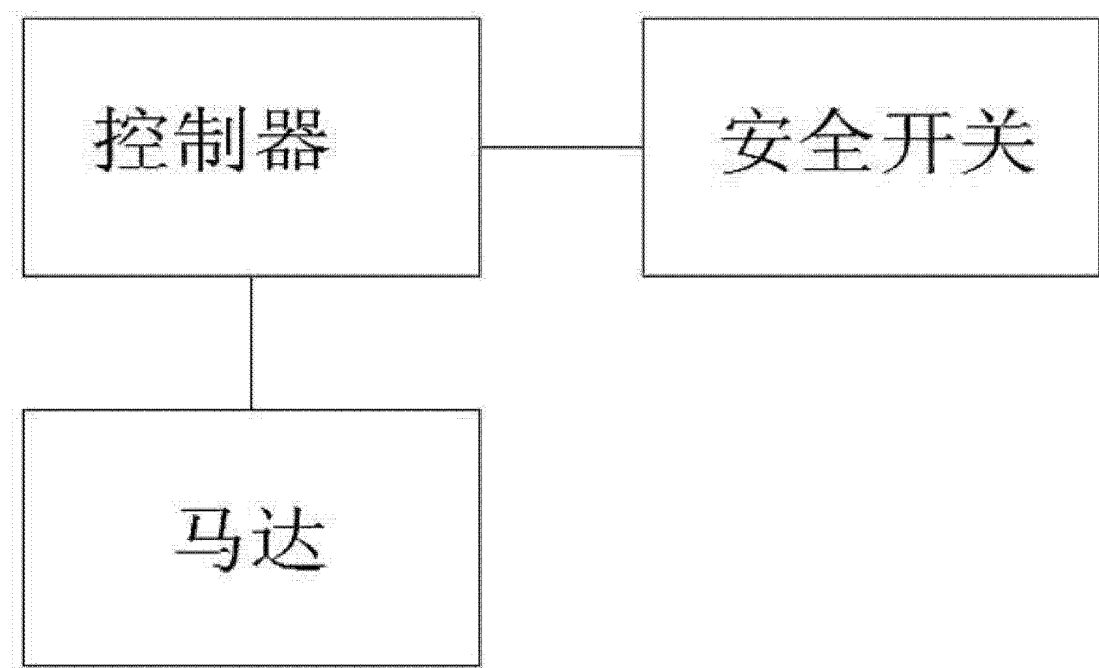


图 4



**English Abstract:**

The utility model discloses a mower with operation protection and a safety switch mechanism of the mower with the operation protection. The safety switch mechanism comprises an inner pipe, a pipe sleeve part, a safety switch with a contact shrapnel, a triggering piece and an elastic piece, wherein the inner pipe is connected with the pipe sleeve in a sleeved and sliding mode, the safety switch with the contact shrapnel is installed in the pipe sleeve, the triggering piece is used for triggering the safety switch by contacting with the contact shrapnel when the inner pipe slides, the elastic piece is used for driving the triggering piece to keep the status of not contacting with the contact shrapnel, and the safety switch, the triggering piece and the elastic piece are all placed at the same side of the inner pipe. On the basis of comprising the safety switch mechanism, the mower further comprises a main machine body and a first level hollow handle rod which is connected with the main machine body in a rotating mode, wherein a motor and a control circuit which controls the motor are arranged on the main machine body, the pipe sleeve is arranged at the end head position of the first level handle rod, and the safety switch can ensure the safety of an operator. When a user is accidentally close to the main machine body, the motor is automatically turned off so that possibility of happening of accidents is reduced.

**English Description:****Technical Field**

The utility model relates to a mower and its safety protection device, in particular relates to a protection operation of a mower, and its safety switch mechanism.

**Background Art**

Lawn mower is a lawn tool for flattening, mainly through the same to the main motor to drive the blade to achieve the shearing blade is too long, in order to realize high efficiency the mowing, the motor power of the lawn-mower is relatively large, therefore, the personal safety of the operator is also a certain danger, now generally through a relatively long of the handle the operator as far away as possible from the main body, thereby avoiding the danger, however, in order to be able to be stored lawn mower, the handle can be often is divided into two sections, it is possible to in operation the handle accidental contraction, leading to two hands of a user near the main body, dangerous.

**Content of the utility model**

In order to solve the defects of the prior art, the purpose of the utility model is to provide a contraction of an accident the handle stop in time when the safety switch mechanism and provided with the safety switch mechanism of the lawn mower.

In order to achieve the above-mentioned objectives, the utility model adopts the following technical scheme:

For sliding the trigger the safety switch mechanism, including the: sliding relatively to each other the inner pipe and the pipe member, the tube member of the safety switch assembly; the inner pipe is provided with a safety stop-position structure, safety switch assembly including: safety switch, the security of the inner tube is triggered when the structure is separated from the safe position of the safety block and the safety switch back to the safe position is reset when the structure of the trigger assembly.

Specifically, as a simple programme, the trigger assembly comprises: one end of which is fixedly connected with the safety switch in the absence of external force of the contact spring can be automatically reset; the other end of the contact spring is used for the free end of the contact with the inner pipe. Safety stop bit structure is used for holding the relaxed state the free end of the contact spring of the accommodating trough.

As a higher reliability of the programme, the trigger assembly further comprises: one end of which is fixedly connected with the safety switch in the absence of external force of the contact spring can be automatically reset, when used for the sliding of the inner pipe and the inner pipe to the contact spring contact to trigger the safety switch a trigger element, for urging the trigger member do not trigger the safety switch part of the state of; the other end of the contact spring for cooperating with the trigger member the free end of the contact. At this moment the security gear structure used for holding the trigger element in the accommodating groove.

Specifically, the security switch, trigger and reset member are both located on the same side of the inner tube; the triggering element is located between the inner tube and the reset member. The trigger element is used to hold the and formed with a notch groove is brought into contact with contact spring; close to the notch groove is formed on one side of the inner pipe with an arc-shaped contact surface. With a trigger element is rotatably connected with the pipe sleeve.

In particular, with elastic reset element is reset by the elastic energy of the elastic member, one end of the elastic piece is fixedly connected with a pipe sleeve member one end of the trigger element is arranged in the spiral spring or the torsion spring of the trigger element to the place of the rotating shafts.

Furthermore, trigger and pipe sleeve member to form a rotation of the inner tube and the axis of rotation is perpendicular to the sliding direction of the tube member. Formed with the trigger element is in contact with the end of the inner pipe is smooth.

The utility model has the protection operation of the lawn mower, including: a main body and is rotatably connected with the hollow of the hand lever at the level of, the main body is provided with a motor and electrically connected with the controller and for control in the above scheme the safety switch mechanism, a pipe sleeve element is arranged on the level at the end of the handle, the inner pipe through the pipe member embedded within the handle at the level of the

sliding connection, a safety switch electrically connected to the controller.

The advantages of the utility model is characterized in that the: through setting up the security switch mechanism can ensure the safety of the operator, in the event of accident the user when close to the, motor automatic shut-down, reducing the possibility of accidents.

#### Description of drawings

Figure 1 is a structure diagram of the trigger suitable for sliding of the safety switch mechanism of a preferred embodiment of the present utility model;

Figure 2 is a structure diagram of the trigger suitable for sliding of the safety of the other of the switching mechanism of a preferred embodiment of the present utility model;

Figure 3 is a structure diagram of a of a lawn mower of the preferred embodiment of the present utility model;

Figure 4 is the circuit diagram of the lawn mower of a preferred embodiment of the present utility model.

In the meaning of the marks on the attached drawing:

1-the inner pipe, 101-slot; 2-pipe member; 3-safety switch, 301-contact spring; 4-trigger, 401-zones, 402-contact surface; 5-the elastic member; 6-a main body; 7-level the handlebar; 8-operation of a handle.

#### Mode of execution

The following combination of the embodiment of Figures and in particular to the present utility model is used as the specific introduction.

With reference to Figure 1 and Figure 2 as shown, suitable for sliding of the utility model the trigger of the safety switch mechanism mainly comprises: the inner pipe 1, pipe member 2 and a safety switch assembly. Wherein the safety switch assembly comprises: a safety switch 3 and is used to trigger a safety switch 3 of the trigger assembly. Safety switch 3 and trigger component is arranged in tube suite 2 internal. In general, the trigger assembly is characterized in that the inner pipe is the safety block is triggered when the structure is separated from the safe position of the safety block and the safety switch is reset position back to the security structure.

With reference to Figure 1 the embodiment shown, as a simple technical scheme, the trigger assembly includes: the contact spring 301, the contact spring 301 and one end of the safety switch 3 is connected with a, the other end is a free end, the inner tube 1 is slid, the inner pipe 1 to the pipe wall of the contact spring 301 to form compression, so that the trigger safety switch 3, the contact spring 301 itself has a certain elasticity, when the inner tube 1 as a safety stop

position of the holding slot of the structure 101 to a safe position, the contact spring 301 not to be subjected to the action of external force due to the reset, the security switch 3 does not constitute a trigger. The inner pipe 1 of the security on the structure is used for holding the contact spring under relaxed state 301 of the free end of the slot 101.

This kind of technical scheme, dependent on the contact spring 301 of its flexibility, there may be caused by the use of frequent failure.

With reference to Figure 2 of the embodiment shown in, the utility model provides a more reliable preferred embodiment, trigger assembly mainly comprises: trigger 4, the elastic member 5 ; safety switch 3, trigger 4 and the elastic member 5 are located on the inner tube 1 of the same side. The inner pipe 1 of the security on the structure is used for holding the trigger 4 receiving groove 101.

Wherein the inner pipe 1 and the pipe member 2 is connected with a, pipe member 2 is connected with the inner pipe 1 of the peripheral, inner pipe 1 of a relatively long size, can pass through the pipe member 2 and slide therein. Safety switch 3 is arranged in the feed-through element 2 of internal, safety switch 3 and the pipe member 2 form a fixed connection, the contact spring 301 is connected with the safety switch 3 is fixed, the other end is a free end, the body of the switch is also provided with a contact, when the contact spring 301 is the free end of the, contact through the contact pressure can be for realizing the on-off control. Of course, used for realizing the mechanical structure of the trigger safety switch can also be other structure, as long as it can realize the contact with the contact, the contact can be relaxed, the other a more feasible scheme is, the contact is arranged on the outer side of a spiral spring, the spiral spring in contact, one end of the coil spring and the switch of the safety switch main body is fixed, the other end is a free end, is provided with a contact plate, the programme more similar to this, in this do not repeat.

Trigger 4 in installation tube suite 2 internal, which mainly is characterized in that the inner pipe 1 and the pipe member 2 is used as the relative sliding of the bridge will transmit energy to the contact spring 301 the free end, of a trigger. As a preferred embodiment, trigger 4 and the pipe member 2 is rotatably connected with a, axis of rotation is perpendicular to the inner pipe 1 and the pipe member 2 in the direction of sliding is connected. In this case, trigger 4 by rotating the can contact or away from the contact spring 301.

Under normal circumstances, we hope that the inner tube 1 relative to the pipe member 2 having a normal working position, that is to say in this position, we do not want to trigger 4 by the inner pipe 1 trigger the safety switch the role of the 3, however, in the event that the inner tube 1 sliding the range of this position, through the contact of the trigger element can be 4 action. The reset member, which is characterized in that the inner pipe 1 back again within the range of working position, the reset member to reset no longer trigger a safety switch 3. The essence of the reset member is an energy storage component, that is, the actuator can be 4 pressed by an external force of the self-energy of energy conversion is, after the external force is removed, the energy release the trigger 4 reset. According to such characteristics, the reset member can be

made of magnetic member or the elastic member can be realized, because they are provided with energy storage characteristics. Consideration for simplifying the structure, with elastic reset element is reset by the elastic energy of the elastic member 5.

Preferably, the elastic member 5 to one end of the tube member 2 is fixedly connected with the other end against the trigger 4 of the spiral spring or is arranged on the trigger 4 the torsion spring of the rotating shaft.

As a kind of preferred scheme, in order to achieve the above-mentioned working position, the inner tube 1 towards the trigger 4 is arranged on one side of the above-mentioned trigger element used for holding 4 the holding slot 101. Trigger 4 toward the inner pipe 1 in receiving the end part of the 101 is within the scope of, the elastic member 5 under the driving of the, trigger 4 not trigger a safety switch 3, is in a normal operating state, when an accident or when the faulty operation, the inner pipe 1 and the pipe member 2 relative to the slide (to the user the direction of the main body), trigger 4 and the end of the slot 101 dislocation, the inner pipe 1 will press the pipe wall of the trigger 4 to rotate, with the contact spring 301 contact, a trigger safety switch 3. Of course, this is just the utility model discloses a technical solution, the programme can also adopt the other, as long as they can realize in the work position, trigger 4 not to be subjected to compression has a sufficient space, in the other position, the trigger element 4 can be suppressed.

In order to be able to the trigger 4 and slot 101 by rotating the slide into slide out of the, trigger 4 forming with the inner tube 1 the end of the contact the inside diameter of the, corresponding slot 101 is also an arc-shaped groove.

As a preferred embodiment, in order to make the trigger 4 and a contact spring sheet 301 of the contact is more reliable, trigger 4 form is used to hold the contact spring and contact 301 a notch 401, this holding and contact to refer primarily to the contact spring 301 of the free end of the holding and contact. Notch 401 close to the inner pipe 1 is formed on one side of the arc-shaped contact surface 402, the arc-shaped contact surface 402 compared with the area of the contact spring 301 to the free end of the many, can better ensure the reliability of the trigger.

With reference to Figure 3 and Figure 4 shows, the utility model has the lawn mower comprises: a main body 6, the hand lever at the level of the aforesaid 7 and safety switch mechanism of the utility model, wherein a main body 6 is provided with a motor, and control the motor, such as the control circuit of the blade, is the main part of the lawn-mower operation, the levels of the handlebar 7 and the main frame 6 is rotatably connected with the telescopic handle as the 1st stage, its internal hollow can accommodate the utility model of the inner pipe of the safety switch mechanism 1, in fact the inner pipe 1 and the pipe member 2 is connected with the relative sliding of the, is also the inner pipe 1 and a level of the handlebar 7 sliding connection, pipe member 2 and a level of the hand lever 7 is fixedly connected with the, tube member 2 is arranged on a level the handle 7 at the end of the, to this end of the handle is a level of 7 the free end, the inner tube 1 through tube suite 2 embedded in a level of the handle 7 is in sliding connection with the inside, the inner tube 1 can be provided with the free end of the operating

handle 8, a safety switch is electrically connected with the controller, the controller and the motor and are electrically connected, thereby realizing the safety switch can control the work of the motor.

With reference to Figure 2 as shown, when the inner tube 1 at the level of the accident to shrink to the handlebar 7 time, may be because the user is operating the operation handle 8 and is too close to the main body 6 so as to cause dangerous, at this time the safety switch 3 is activated, motor shutting down, reducing the possibility of the danger of the user.

The above shown and described the basic principle of this utility model, main features and advantages. The industry technical personnel should understand, the above-mentioned embodiment does not in any way restrict the utility model, where the equivalent manner of replacing or equivalent transform the technical scheme of the obtained, all fall in the utility model the scope of protection.

#### **ENGLISH CLAIMS:**

**1. For sliding the trigger the safety switch mechanism, including: relatively to each other and sliding inner pipe tube suite , characterized in that it also comprises: suite of the above-mentioned tube in the installation of the safety switch assembly; the above-mentioned inner tube is provided with a safety stop-position structure, the above-mentioned safety switch assembly including: safety switch, the safety of the above-mentioned inner tube is triggered when the structure is separated from the safe position of the safety block and the safety switch back to the safe position is reset when the structure of the trigger assembly.**

**2. For sliding the trigger safety switch mechanism according to Claim 1, characterized in that the above-mentioned trigger assembly comprises: one end is fixedly connected with the above-mentioned safety switch in the absence of external force of the contact spring can be automatically reset; the contact spring to the other end of the contact for the free end of the inner tube.**

**3. For sliding the trigger safety switch mechanism according to Claim 2, characterized in that the above-mentioned safety stop bit structure is used for holding the relaxed state of the above-mentioned under the free end of the contact spring receiving groove.**

**4. For sliding the trigger safety switch mechanism according to Claim 1, characterized in that the above-mentioned trigger assembly further comprises: one end is fixedly connected with the above-mentioned safety switch in the absence of external force of the contact spring can be automatically reset, used in the above-mentioned inner tube and the inner tube when sliding contact with the contact spring to the trigger the trigger element of the safety switch, is used for driving the above-mentioned trigger member do not trigger the safety switch part of the state of; the above-mentioned the other end of the contact spring is used for matching with the above-mentioned trigger member the free end of the contact.**

5. For sliding the trigger safety switch mechanism according to Claim 4, characterized in that the above-mentioned safety gear structure of the above-mentioned trigger element for the accommodating trough.

6. For sliding the trigger safety switch mechanism according to Claim 5, characterized in that the above-mentioned safety switch, and the trigger element of the above-mentioned are located on the same side of the inner tube; the above-mentioned trigger member is located between the above-mentioned inner tube and the reset member.

7. For sliding the trigger safety switch mechanism according to Claim 5, characterized in that the above-mentioned trigger element and formed with a notch groove contact the above-mentioned contact spring; the close to the above-mentioned notch formed on one side of the inner pipe with an arc-shaped contact surface.

8. For sliding the trigger safety switch mechanism as in any of claims 5 to 7, characterized in that the above-mentioned trigger member and the sleeve member form a rotary connection.

9. For sliding the trigger safety switch mechanism according to Claim 8, characterized in that the reset member is an elastic reset by the elastic energy of the elastic member, the elastic member is a suite of the above-mentioned tube and is fixedly connected with the above-mentioned one end of the trigger element is arranged in the spiral spring or the torsion spring of the trigger element to the place of the rotating shafts.

10. For sliding the trigger safety switch mechanism according to Claim 9, characterized in that the above-mentioned trigger member and the above-mentioned pipe sleeve is rotatably connected with a axis of rotation perpendicular to the above-mentioned inner tube and the tube the sliding direction of the external member.

11. For sliding the trigger safety switch mechanism according to Claim 10, characterized in that the above-mentioned trigger element with the above-mentioned formed with the smooth contact with the end of the inner tube.

12. The protection operation of the lawn mower, including: a main body and is rotatably connected with the hollow of the hand lever at the level of, the above-mentioned main the main body is provided with a motor and electrically connected with the controller for control, characterized in that it also comprises :-11 of the suitable for sliding the trigger of the safety switch mechanism according to Claim 1, the above-mentioned tube suite is set in the above-mentioned level at the end of the handle, the above-mentioned inner tube through the above-mentioned tube member is inserted into the inside of the handle at the level of the sliding connection, the above-mentioned safety switch and the above-mentioned control device are electrically connected.



## (12) 发明专利申请

(10) 申请公布号 CN 102845186 A

(43) 申请公布日 2013.01.02

(21) 申请号 201210387914.9

(22) 申请日 2012.10.15

(71) 申请人 南京德朔实业有限公司

地址 211106 江苏省南京市江宁经济技术开  
发区将军大道 159 号

(72) 发明人 山冈敏成 聂方杰 许海深  
邵贤典

(74) 专利代理机构 南京纵横知识产权代理有限  
公司 32224

代理人 董建林

(51) Int. Cl.

A01D 75/18(2006.01)

A01D 34/00(2006.01)

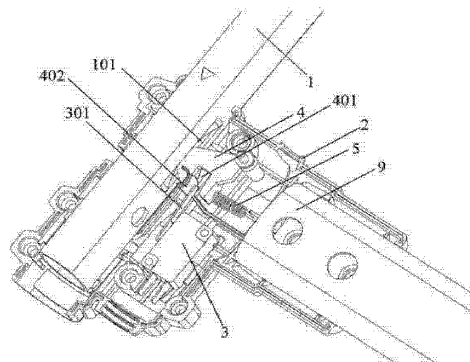
权利要求书 1 页 说明书 4 页 附图 4 页

### (54) 发明名称

具有操作保护的割草机及其安全开关机构

### (57) 摘要

本发明公开了一种具有操作保护的割草机及其安全开关机构,其中安全开关机构,包括:通过套接构成滑动连接的内管和管套件、安装在上述管套件内的带有接触弹片的安全开关、用于在上述内管滑动时通过接触上述接触弹片而触发安全开关的触发件、用于驱使上述触发件保持不接触上述接触弹片状态的弹性件;上述安全开关、触发件和弹性件均位于上述内管的同侧;本发明的割草机在包括安全开关机构的基础上还包括:主机体和与之转动连接的中空的一级把手杆,上述主机体设有马达和控制马达的控制电路,上述管套件设置在上述一级把手杆的端头处,安全开关机构能够保证操作者的安全,在使用者意外靠近主机体时,马达自动关机,降低发生意外的可能性。





1. 适用于滑动触发的安全开关机构,包括:彼此能够相对滑动的内管和管套件,其特征在于,还包括:安装在上述管套件内的安全开关组件;上述内管设有安全档位结构,上述安全开关组件包括:安全开关、在上述内管的安全档位结构脱离安全位置时触发安全开关并在安全档位结构回到安全位置时复位的触发组件。

2. 根据权利要求1所述的适用于滑动触发的安全开关机构,其特征在于,上述触发组件包括:一端与上述安全开关固定连接的在没有外力作用下能自动复位的接触弹片;上述接触弹片的另一端为用于与上述内管接触的自由端。

3. 根据权利要求2所述的适用于滑动触发的安全开关机构,其特征在于,上述安全档位结构为用于容纳放松状态下的上述接触弹片的自由端的容纳槽。

4. 根据权利要求1所述的适用于滑动触发的安全开关机构,其特征在于,上述触发组件还包括:一端与上述安全开关固定连接的在没有外力作用下能自动复位的接触弹片、用于在上述内管滑动时与上述内管接触从而压迫上述接触弹片触发上述安全开关的触发件、用于驱使上述触发件保持不触发上述安全开关的状态的复位件;上述接触弹片的另一端为用于与上述触发件接触配合的自由端。

5. 根据权利要求4所述的适用于滑动触发的安全开关机构,其特征在于,上述安全档位结构为用于容纳上述触发件的容纳槽。

6. 根据权利要求5所述的适用于滑动触发的安全开关机构,其特征在于,上述安全开关、触发件和复位件均位于上述内管的同侧;上述触发件位于上述内管和复位件之间。

7. 根据权利要求5所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件形成有用于容纳和接触上述接触弹片的缺口槽;上述缺口槽靠近上述内管的一侧形成有弧形的接触面。

8. 根据权利要求5至7任意一项所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件与上述管套件构成转动连接。

9. 根据权利要求8所述的适用于滑动触发的安全开关机构,其特征在于,上述复位件为具有弹性的依靠弹性能量实现复位的弹性件,上述弹性件为一端与上述管套件固定连接另一端顶住上述触发件的螺旋弹簧或设置在触发件转轴处的扭力弹簧。

10. 根据权利要求9所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件与上述管套件构成转动连接的转动轴线垂直于上述内管与管套件滑动连接的方向。

11. 根据权利要求10所述的适用于滑动触发的安全开关机构,其特征在于,上述触发件形成有用于与上述内管接触的圆滑的端部。

12. 具有操作保护的割草机,包括:主机体和与之转动连接的中空的一级把手杆,上述主机体设有马达和与之电连接用于控制的控制器,其特征在于,还包括:如权利要求1至11任意一项所述的适用于滑动触发的安全开关机构,上述管套件设置在上述一级把手杆的端头处,上述内管通过上述管套件嵌入上述一级把手杆内部与之构成滑动连接,上述安全开关与上述控制器构成电连接。

## 具有操作保护的割草机及其安全开关机构

### 技术领域

[0001] 本发明涉及一种割草机及其安全保护装置,具体涉及一种具有操作保护的割草机及其安全开关机构。

### 背景技术

[0002] 割草机是一种用于平整草坪的工具,其主要通过主机体的马达带动刀片实现对过长的草叶的剪切,为了实现高效率的割草,割草机的马达功率比较大,因此其对操作者的人身安全也有一定隐患,现在一般通过较长的把手杆使操作者尽可能远离主机体,避免发生危险,但是为了能够方便收纳割草机,把手杆往往分为可伸缩两段,这就有可能在操作时把手杆意外收缩,导致使用者双手靠近主机体,发生危险。

### 发明内容

[0003] 为解决现有技术的不足,本发明的目的在于提供一种能够在把手发生意外收缩时及时停机的安全开关机构及具有该安全开关机构的割草机。

[0004] 为了实现上述目标,本发明采用如下的技术方案:

适用于滑动触发的安全开关机构,包括:彼此能够相对滑动的内管和管套件,安装在管套件内的安全开关组件;内管设有安全档位结构,安全开关组件包括:安全开关、在内管的安全档位结构脱离安全位置时触发安全开关并在安全档位结构回到安全位置时复位的触发组件。

[0005] 具体而言,作为一种简单的方案,触发组件包括:一端与安全开关固定连接的在没有外力作用下能自动复位的接触弹片;接触弹片的另一端为用于与内管接触的自由端。安全档位结构为用于容纳放松状态下的接触弹片的自由端的容纳槽。

[0006] 作为一种可靠性较高的方案,触发组件还包括:一端与安全开关固定连接的在没有外力作用下能自动复位的接触弹片、用于在内管滑动时与内管接触从而压迫接触弹片触发安全开关的触发件、用于驱使触发件保持不触发安全开关的状态的复位件;接触弹片的另一端为用于与触发件接触配合的自由端。此时安全档位结构为用于容纳触发件的容纳槽。

[0007] 具体而言,安全开关、触发件和复位件均位于内管的同侧;触发件位于内管和复位件之间。触发件形成有用于容纳和接触接触弹片的缺口槽;缺口槽靠近内管的一侧形成有弧形的接触面。触发件与管套件构成转动连接。

[0008] 特别地,复位件为具有弹性的依靠弹性能量实现复位的弹性件,弹性件为一端与管套件固定连接另一端顶住触发件的螺旋弹簧或设置在触发件转轴处的扭力弹簧。

[0009] 进一步的,触发件与管套件构成转动连接的转动轴线垂直于内管与管套件滑动连接的方向。触发件形成有用于与内管接触的圆滑的端部。

[0010] 本发明的具有操作保护的割草机,包括:主机体和与之转动连接的中空的一级把手杆,主机体设有马达和与之电连接用于控制的控制器以及前述方案中的安全开关机构,

管套件设置在一级把手杆的端头处,内管通过管套件嵌入一级把手杆内部与之构成滑动连接,安全开关与控制器构成电连接。

[0011] 本发明的有益之处在于:通过设置安全开关机构能够保证操作者的安全,在发生使用者意外靠近主机体时,马达自动关机,降低发生意外的可能性。

#### 附图说明

[0012] 图 1 是本发明的适用于滑动触发的安全开关机构的一个优选实施例的结构示意图;

图 2 是本发明的适用于滑动触发的安全开关机构的另一个优选实施例的结构示意图;

图 3 是本发明的割草机的一个优选实施例的结构示意图;

图 4 是本发明的割草机一个优选实施例的电路框图。

[0013] 图中附图标记的含义:

1- 内管,101- 容纳槽;2- 管套件;3- 安全开关,301- 接触弹片;4- 触发件,401- 缺口槽,402- 接触面;5- 弹性件;6- 主机体;7- 一级把手杆;8- 操作把手。

#### 具体实施方式

[0014] 以下结合附图和具体实施例对本发明作具体的介绍。

[0015] 参照图 1 和图 2 所示,本发明的适用于滑动触发的安全开关机构主要包括:内管 1、管套件 2 和安全开关组件。其中,安全开关组件包括:安全开关 3 和用于触发安全开关 3 的触发组件。安全开关 3 和触发组件是设置在管套件 2 内部的。总的来说,触发组件作用在于在内管的安全档位结构脱离安全位置时触发安全开关并在安全档位结构回到安全位置时复位。

[0016] 参照图 1 所示的实施例,作为一种简洁的技术方案,触发组件包括:接触弹片 301,接触弹片 301 的一端与安全开关 3 构成连接,另一端为自由端,在内管 1 滑动时,内管 1 的管壁对接触弹片 301 构成压迫,使其触发安全开关 3,接触弹片 301 本身具有一定的弹性,当内管 1 滑动使作为安全档位结构的容纳槽 101 至安全位置时,接触弹片 301 由于不受到外力的作用复位,对安全开关 3 不构成触发。内管 1 上的安全档位结构为用于容纳放松状态下的接触弹片 301 的自由端的容纳槽 101。

[0017] 这种技术方案,依赖接触弹片 301 自身的弹性,可能会出现由于使用频繁而造成失效。

[0018] 参照图 2 所示的实施例,本发明提供了一种更为可靠的优选方案,触发组件主要包括:触发件 4、弹性件 5;安全开关 3、触发件 4 和弹性件 5 均位于内管 1 的同侧。内管 1 上的安全档位结构为用于容纳触发件 4 容纳槽 101。

[0019] 其中,内管 1 与管套件 2 构成滑动连接,管套件 2 套接在内管 1 的外围,内管 1 的尺寸较长,能够穿过管套件 2 并在其中滑动。安全开关 3 设置在套管件 2 的内部,安全开关 3 与管套件 2 构成固定连接,接触弹片 301 一端与安全开关 3 固定连接,另一端为自由端,开关主体上还设有一个触点,当接触弹片 301 的自由端被压迫时,即能通过接触压迫触点实现通断的控制。当然,用于实现触发安全开关的机械结构也可以是其他结构,只要能实现在压迫时接触触点,放松时脱离触点即可,另一种较为可行的方案为,在触点外侧设置一螺

旋弹簧,触点位于螺旋弹簧中,螺旋弹簧的一端与安全开关的开关主体固定,另一端为自由端,设有一个接触板,类似于此的方案较多,在此不加赘述。

[0020] 触发件 4 安装在管套件 2 内部,其主要作用在于在内管 1 与管套件 2 的相对滑动时作为桥梁将能量传递到接触弹片 301 的自由端,实现触发。作为优选方案,触发件 4 与管套件 2 构成转动连接,转动轴线垂直于内管 1 与管套件 2 滑动连接的方向。这样一来,触发件 4 通过转动可以接触或远离接触弹片 301。

[0021] 在一般情况下,我们希望内管 1 相对管套件 2 具有一个正常的工作位置,也就是说在这个位置时,我们不希望触发件 4 受到内管 1 的作用触发安全开关 3,但是一旦内管 1 滑动出这个位置的范围,即能通过接触使触发件 4 动作。而复位件的作用在于在内管 1 重新滑回工作位置的范围时,复位件能够复位不再触发安全开关 3。复位件的实质是一个蓄能构件,即其能将触发件 4 被外力压迫的能量转化为自身的能量,在外力撤销之后,将能量释放使触发件 4 复位。根据这样的特点,复位件可以采用磁性构件或弹性构件得以实现,因为它们均具有蓄能的特点。出于简化结构的考虑,复位件为具有弹性的依靠弹性能量实现复位的弹性件 5。

[0022] 作为优选,弹性件 5 为一端与管套件 2 固定连接另一端顶住触发件 4 的螺旋弹簧或设置在触发件 4 转轴处的扭力弹簧。

[0023] 作为一种优选方案,为了实现前述的工作位置,内管 1 朝向触发件 4 的一侧设有用于容纳上述触发件 4 的容纳槽 101。触发件 4 的朝向内管 1 的端部在容纳槽 101 的范围之内时,在弹性件 5 的驱动下,触发件 4 不触发安全开关 3,处于正常工作的状态,当发生意外或误操作时,内管 1 与管套件 2 相对滑动(向使用者靠近主机体的方向),触发件 4 的端部与容纳槽 101 错位,内管 1 的管壁将压迫触发件 4 转动,使之与接触弹片 301 接触,实现触发安全开关 3。当然这只是本发明一个技术方案,还可以采用其他方案实现,只要能够实现在工作位置时,触发件 4 不受到压迫具有足够空间,在其他位置时,触发件 4 受到压迫即可。

[0024] 为了能够便于触发件 4 和容纳槽 101 的通过转动滑进滑出,触发件 4 形成有用于与内管 1 接触的圆滑的端部,相应的容纳槽 101 也是一个弧形的槽。

[0025] 作为优选方案,为了使触发件 4 与接触弹片 301 的接触更为可靠,触发件 4 形成有用于容纳和接触上述接触弹片 301 的缺口槽 401,这个容纳和接触主要指的是对接触弹片 301 的自由端的容纳和接触。缺口槽 401 靠近内管 1 的一侧形成有弧形的接触面 402,这个弧形接触面 402 的面积相比接触弹片 301 的自由端要大的很多,能够很好地保证触发的可靠性。

[0026] 参照图 3 和图 4 所示,本发明的割草机包括:主机体 6、一级把手杆 7 以及前述的本发明的安全开关机构,其中,主机体 6 设有马达、控制马达的控制电路以及刀片等,是实现割草机工作能的主要部分,一级把手杆 7 与主机体 6 转动连接作为主要可伸缩把手的第一级,它内部中空可以容纳本发明的安全开关机构中的内管 1,实际上内管 1 与管套件 2 的相对滑动连接,也是内管 1 与一级把手杆 7 滑动连接,管套件 2 与一级把手杆 7 固定连接实现的,管套件 2 设置在一级把手杆 7 的端头处,这个端头指的是一级把手杆 7 的自由端,内管 1 通过管套件 2 嵌入一级把手杆 7 内部与之构成滑动连接,内管 1 的自由端可以设置操作把手 8,安全开关与控制器构成电连接,控制器与马达又构成电连接,从而实现安全开关能够控制马达的工作。

[0027] 参照图 2 所示,当内管 1 意外收缩到一级把手杆 7 时,使用者可能会因为正在操作操作把手 8 而过于接近主机体 6 从而造成危险,此时安全开关 3 被触发,马达停机,降低了使用者发生危险的可能性。

[0028] 以上显示和描述了本发明的基本原理、主要特征和优点。本行业的技术人员应该了解,上述实施例不以任何形式限制本发明,凡采用等同替换或等效变换的方式所获得的技术方案,均落在本发明的保护范围内。

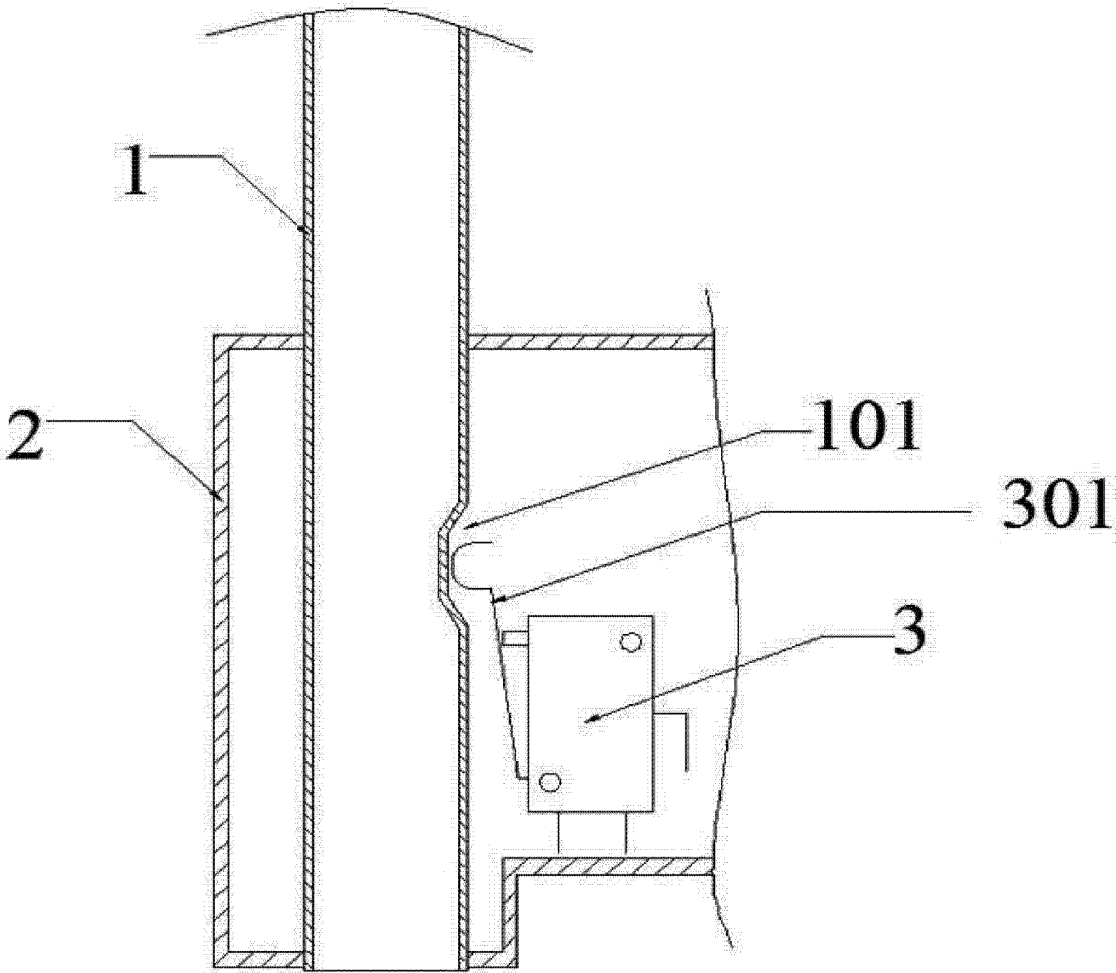


图 1

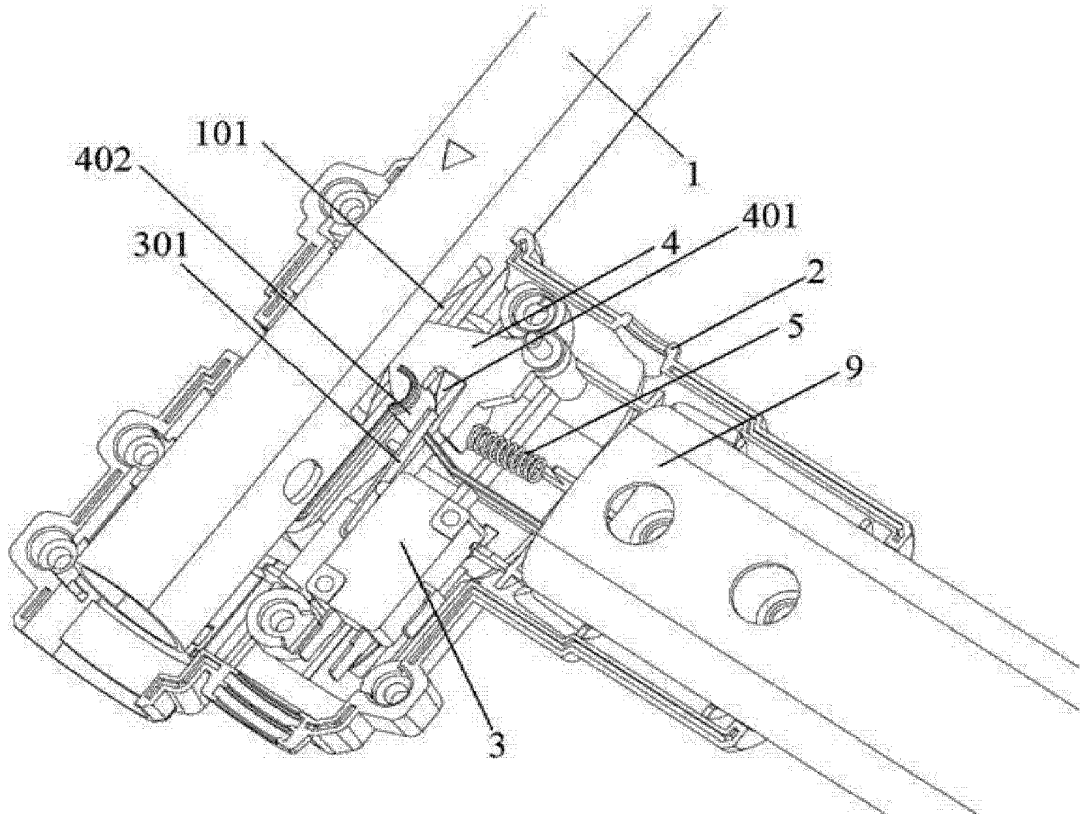


图 2

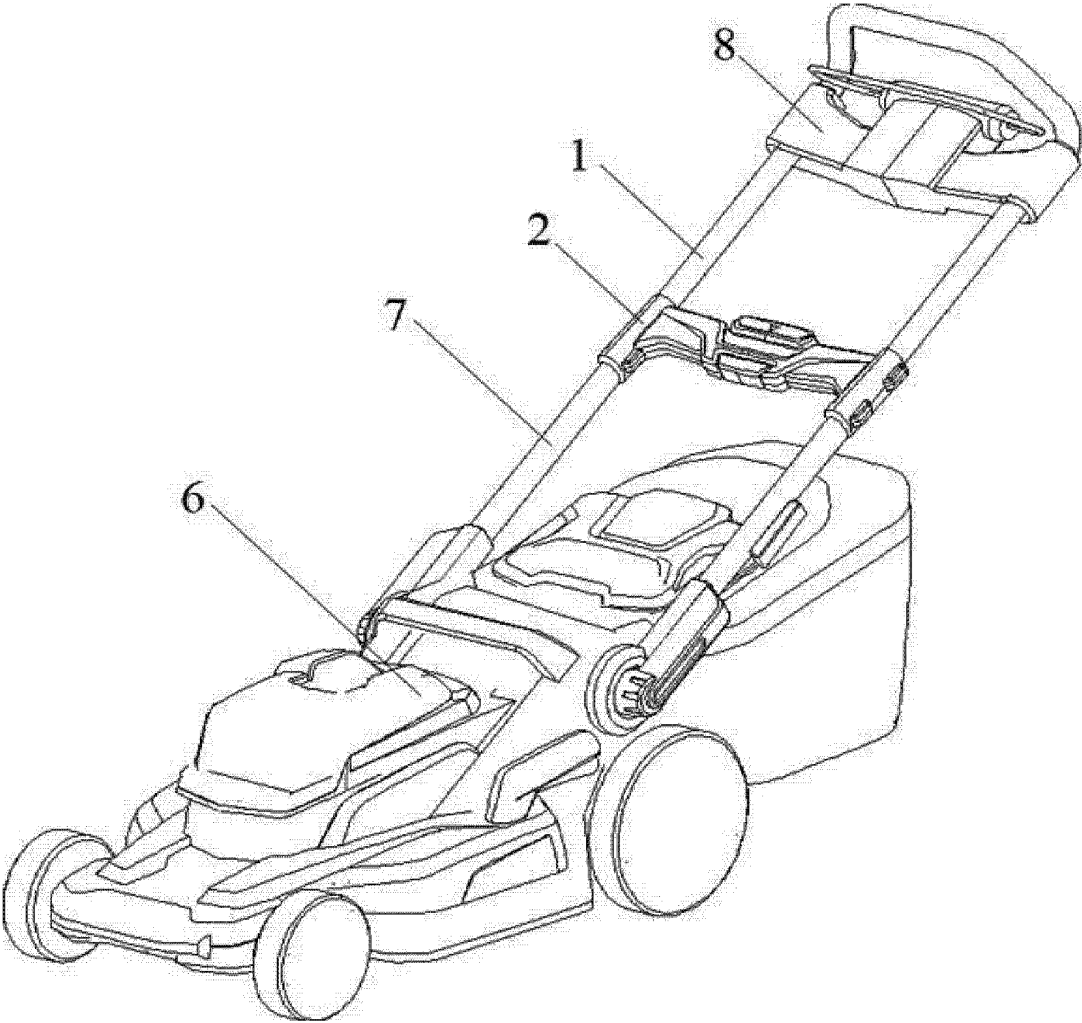


图 3



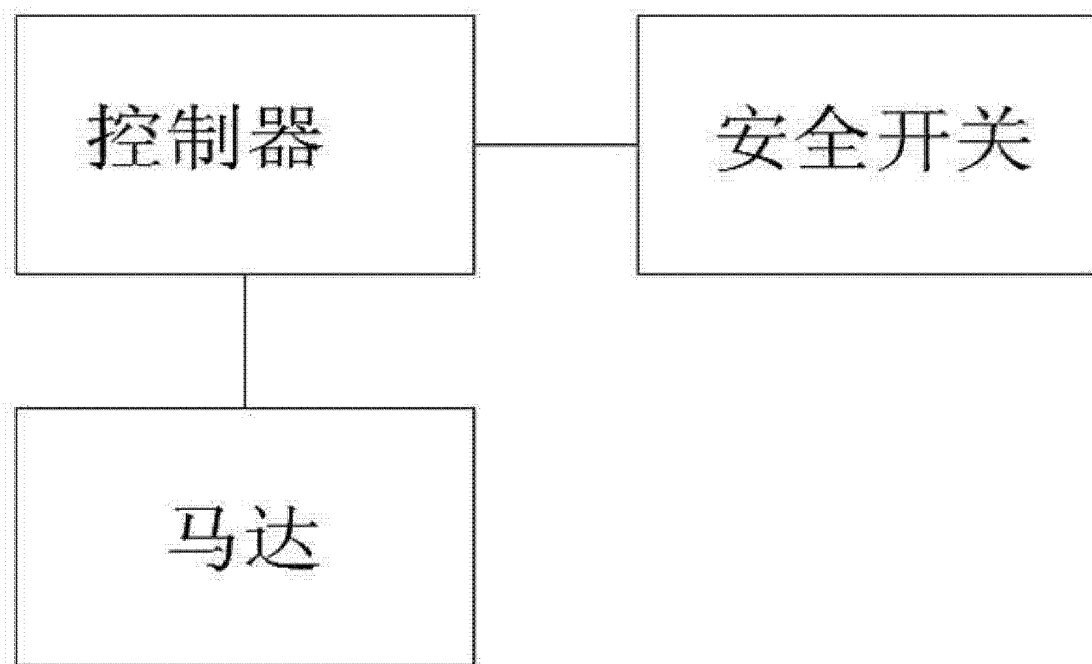


图 4

Electronic Acknowledgement Receipt	
EFS ID:	26912336
Application Number:	15250408
International Application Number:	
Confirmation Number:	8522
Title of Invention:	GARDENING TOOL
First Named Inventor/Applicant Name:	Toshinari Yamaoka
Customer Number:	34018
Filer:	Gary R. Jarosik/Cynthia Tapia
Filer Authorized By:	Gary R. Jarosik
Attorney Docket Number:	78873.176US2
Receipt Date:	13-SEP-2016
Filing Date:	29-AUG-2016
Time Stamp:	16:11:54
Application Type:	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no				
<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	078873_176US2Trans.pdf	189972	no	2
			84fbd5662bb7c9f505bb7e28f6ea5bb9342ad4d7		
<b>Warnings:</b>					

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	078873_176US2IDS.pdf	166639	no	6
			c32d3819f64fbc079ddb34b4c74e05818056339		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	CN1299582A.pdf	604319	no	19
			31d2d4be80f74bc8c27ce13bd8e65ca2012d6ca5		
Warnings:					
Information:					
4	Foreign Reference	CN101897261A.pdf	1108492	no	34
			cf9ddb36e2c2181d6d769fcdff4ffacc39feb4fe		
Warnings:					
Information:					
5	Foreign Reference	CN102683052A.pdf	290459	no	8
			f56843a6aeb351bf073fd479b12d4a996600afb0		
Warnings:					
Information:					
6	Foreign Reference	CN201146132Y.pdf	291293	no	9
			48c1172f45c171b4f9cce2b7400b84ef5537727		
Warnings:					
Information:					
7	Foreign Reference	CN201821663U.pdf	494880	no	17
			a8831b83513360576708b2e8505a759cb787fdff		
Warnings:					
Information:					
8	Foreign Reference	CN202873363U.pdf	930626	no	17
			80ec3c9668adb3f2c9e04ffa3a2341e19678b64		
Warnings:					
Information:					

9	Foreign Reference	CN102845186A.pdf	840162	no	10
			32d4903dcfd0c9583763e5efab145b39395a5671		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>				4916842	
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>					

<b>TRANSMITTAL FORM</b>  <i>(to be used for all correspondence after initial filing)</i>	Application Number	15/250,408
	Filing Date	August 29, 2016
	First Named Inventor	Toshinari Yamaoka
	Art Unit	3671
	Examiner Name	
Total Number of Pages in This Submission	Attorney Docket Number	078873.176US2

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): - Foreign Patent Documents (7 refs.)
Remarks Filed via EFS Web		
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	Greenberg Traurig, LLP	
Signature	/Gary R. Jarosik/	
Printed name	Gary R. Jarosik	
Date	September 13, 2016	Reg. No. 35,906

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
Signature	/Cynthia Tapia/		
Typed or printed name	Cynthia Tapia	Date	September 13, 2016

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/250,408	08/29/2016	Toshinari Yamaoka	78873.176US2

**CONFIRMATION NO. 8522**

**FORMALITIES LETTER**



34018  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

Date Mailed: 09/09/2016

**NOTICE TO FILE CORRECTED APPLICATION PAPERS**

***Filing Date Granted***

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - More than one figure is present and each figure is not labeled "Fig." with a consecutive Arabic numeral (1, 2, etc.) or an Arabic numeral and capital letter in the English alphabet (A, B, etc.)(see 37 CFR 1.84(u)(1)). See Figure(s) 3. A brief description of the several views of the drawings (see 37 CFR 1.74) should be added or amended to correspond to the corrected numbering of the figures. See also 37 CFR 1.77(b)(9).

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".  
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/fasrat/

---



<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875						Application or Docket Number 15/250,408	
<b>APPLICATION AS FILED - PART I</b>							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (j), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 = *			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL		TOTAL	1600
<b>APPLICATION AS AMENDED - PART II</b>							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/250,408	08/29/2016	3671	1600	78873.176US2	20	2

CONFIRMATION NO. 8522

FILING RECEIPT



0000000085879034

34018  
GREENBERG TRAURIG, LLP  
77 WEST WACKER DRIVE  
SUITE 3100  
CHICAGO, IL 60601-1732

Date Mailed: 09/09/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Toshinari Yamaoka, Nanjing, CHINA;  
Fangjie Nie, Nanjing, CHINA;  
Haishen Xu, Nanjing, CHINA;

Applicant(s)

CHERVON INTELLECTUAL PROPERTY LIMITED, Road Town, VIRGIN ISLANDS, BRITISH;

Assignment For Published Patent Application

Chervon Intellectual Property Limited

**Power of Attorney:** The patent practitioners associated with Customer Number 34018

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/511,490 10/10/2014

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

CHINA 201310468919.9 10/10/2013

CHINA 201410167041.X 04/23/2014

**Permission to Access Application via Priority Document Exchange:** No

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

**If Required, Foreign Filing License Granted:** 09/08/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/250,408**

**Projected Publication Date:** To Be Determined - pending completion of Corrected Papers

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

GARDENING TOOL

**Preliminary Class**

056

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

**LICENSE FOR FOREIGN FILING UNDER**  
**Title 35, United States Code, Section 184**  
**Title 37, Code of Federal Regulations, 5.11 & 5.15**

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

---

**SelectUSA**

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4029426

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
TOSHINARI YAMAOKA	10/09/2014
FANGJIE NIE	10/09/2014
HAISHEN XU	10/09/2014
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	CHERVON INTELLECTUAL PROPERTY LIMITED
<b>Street Address:</b>	OFFSHORE INCORPORATIONS CENTRE
<b>Internal Address:</b>	ROAD TOWN
<b>City:</b>	TORTOLA
<b>State/Country:</b>	VIRGIN ISLANDS, BRITISH
<b>PROPERTY NUMBERS Total: 3</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	15250408
Application Number:	15250476
Application Number:	15250516
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(312)456-8435
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	3124568400
<b>Email:</b>	chiipmail@gtlaw.com
<b>Correspondent Name:</b>	KEITH R. JAROSIK
<b>Address Line 1:</b>	GREENBERG TRAURIG, LLP
<b>Address Line 2:</b>	77 WEST WACKER DRIVE, SUITE 3100
<b>Address Line 4:</b>	CHICAGO, ILLINOIS 60601-1732
<b>ATTORNEY DOCKET NUMBER:</b>	078873.176US2/3/4
<b>NAME OF SUBMITTER:</b>	KEITH R. JAROSIK
<b>SIGNATURE:</b>	/Keith R. Jarosik/
<b>DATE SIGNED:</b>	08/30/2016
This document serves as an Oath/Declaration (37 CFR 1.63).	

**Total Attachments: 4**

source=Assignment#page1.tif

source=Assignment#page2.tif

source=Assignment#page3.tif

source=Assignment#page4.tif

**PATENT ASSIGNMENT AND DECLARATION**

WHEREAS, we, Toshinari Yamaoka of 16-704 Renheng Bamboo Garden, No. 5 Yulan Road, Yuhua District, Nanjing, Jiangsu Province, P. R. China; Fangjie Nie of Room 402 Biboge, Culture Country, No. 88 Tianyuan Road, Jiangning District, Nanjing, Jiangsu Province, P. R. China; and Haishen Xu of Room 302, No. 32, Rehe South Road, Xiaguan District, Nanjing, Jiangsu Province, P. R. China; have invented a certain new and useful invention entitled **GARDENING TOOL, PARTICULARLY MOWER** for which a patent application has been prepared for filing with the United States Patent & Trademark Office, which has been assigned application number 14/511,490.

**I. ASSIGNMENT**

NOW THEREFORE, be it known that for good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, we, hereby sell and assign to **CHERVON INTELLECTUAL PROPERTY LIMITED**, ("Assignee"), a British Virgin Islands corporation, having its principal place of business at Offshore Incorporations Centre, Road Town, Tortola, British Virgin Islands, its successors, assigns, nominees, or other legal representatives, the entire right, title, and interest in and to the invention invented by me, and the application for United States patent therefor, the declaration, and all original and reissued patents granted therefor, and all divisions and continuations thereof, including the subject-matter of any and all claims which may be obtained in every such patent, and the right to apply for and obtain patents and Utility Model Registrations which may be granted thereon in such foreign countries, and authorize and request the Commissioner of Patents and Trademarks of the United States, and any official of any other country or countries foreign to the United States whose duty it is to issue patents on applications as aforesaid, to issue said Letters Patent or Utility Model Registration to the said Assignee, its successor, assigns, nominees, or other legal representatives, as assignee of the entire interest herein assigned. We covenant that we have not executed and will not execute any agreement in conflict herewith and agree that we will communicate to said Assignee, its successors, assigns, nominees, or other legal representatives, all facts known to us respecting said invention, whenever requested, and testify in any legal proceedings, sign all lawful papers, execute all divisional, continuing, and reissue applications, make all rightful oaths, and do all lawful acts requisite for the application for such divisional, continuing, or reissue applications, or the procuring thereof, and that if and when said Assignee, its successors, assigns, nominees, or other legal representatives desire to file a disclaimer relating thereto, we will, upon request, sign all lawful papers requisite for the filing of such disclaimer. We further covenant and agree that we will, at any time upon request, do everything legally possible to aid said Assignee, its successors, assignees, nominees, or other legal representatives, either in its or their own names, to apply for, obtain, and enforce proper patent and/or Utility Model protection for said invention in all countries, all without further consideration but at the expense of said Assignee, its successors, assigns, nominees, or other legal representatives.

ASSIGNOR hereby grants to the law firm of GREENBERG TRAURIG, LLP of Chicago, Illinois, authority and power to insert on this instrument any further identification which may be necessary or desirable for purposes of recordation in the United States Patent Office or the Patent Office of any foreign country.



**II. DECLARATION**

**Inventor 1**

As the below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

☐ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of October, 2014.

Toshinari Yamacka  
Toshinari Yamacka (signature)

Witness:

[Signature]  
(signature)

Dan Gao

\_\_\_\_\_  
(printed name)

Inventor 2

As the below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

☐ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

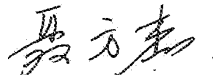
The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of October, 2014.



Fangjie Nie (signature)

Witness:



(signature)

Dan Gao

(printed name)

**Inventor 3**

As the below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

\_\_\_\_\_ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.


I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of  
October, 2014.

  
Haishen Xu (signature)

Witness:   
\_\_\_\_\_  
(signature)  
Dan Gao  
\_\_\_\_\_  
(printed name)

CHI 65206160v1

<b>UTILITY PATENT APPLICATION TRANSMITTAL</b>  <small>(Only for new nonprovisional applications under 37 CFR 1.53(b))</small>		Attorney Docket No. <b>078873.176US2</b>	
		First Named Inventor <b>Toshinari Yamaoka</b>	
		Title <b>GARDENING TOOL</b>	
		Express Mail Label No. <b>Filed via EFS Web</b>	

<b>APPLICATION ELEMENTS</b> <small>See MPEP chapter 600 concerning utility patent application contents.</small>	<b>ADDRESS TO:</b> <b>Commissioner for Patents</b> <b>P.O. Box 1450</b> <b>Alexandria, VA 22313-1450</b>
<ol style="list-style-type: none"> <li>1. <input type="checkbox"/> <b>Fee Transmittal Form</b> (PTO/SB/17 or equivalent)</li> <li>2. <input type="checkbox"/> <b>Applicant asserts small entity status.</b> See 37 CFR 1.27</li> <li>3. <input type="checkbox"/> <b>Applicant certifies micro entity status.</b> See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.</li> <li>4. <input checked="" type="checkbox"/> <b>Specification</b> [Total Pages <u>21</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement)</li> <li>5. <input checked="" type="checkbox"/> <b>Drawing(s)</b> (35 U.S.C. 113) [Total Sheets <u>6</u>]</li> <li>6. <input type="checkbox"/> <b>Inventor's Oath or Declaration</b> [Total Pages <u>4</u>] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> Newly executed (original or copy)</li> <li>b. <input checked="" type="checkbox"/> A copy from a prior application (37 CFR 1.63(d))</li> </ol> </li> <li>7. <input checked="" type="checkbox"/> <b>Application Data Sheet</b> * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent)</li> <li>8. <input type="checkbox"/> <b>CD-ROM or CD-R</b> in duplicate, large table, or Computer Program (Appendix)             <div style="margin-left: 20px;"> <input type="checkbox"/> Landscape Table on CD             </div> </li> <li>9. <b>Nucleotide and/or Amino Acid Sequence Submission</b> (if applicable, items a. – c. are required)             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> Computer Readable Form (CRF)</li> <li>b. <input type="checkbox"/> Specification Sequence Listing on:                 <ol style="list-style-type: none"> <li>i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or</li> <li>ii. <input type="checkbox"/> Paper</li> </ol> </li> <li>c. <input type="checkbox"/> Statements verifying identity of above copies</li> </ol> </li> </ol>	<b>ACCOMPANYING APPLICATION PAPERS</b> <ol style="list-style-type: none"> <li>10. <input checked="" type="checkbox"/> <b>Assignment Papers</b> (cover sheet &amp; document(s)) Name of Assignee <u>Chervon Intellectual Property Limited</u></li> <li>11. <input checked="" type="checkbox"/> <b>37 CFR 3.73(c) Statement</b> <input checked="" type="checkbox"/> <b>Power of Attorney</b> (when there is an assignee)</li> <li>12. <input type="checkbox"/> <b>English Translation Document</b> (if applicable)</li> <li>13. <input checked="" type="checkbox"/> <b>Information Disclosure Statement</b> (PTO/SB/08 or PTO-1449) <input checked="" type="checkbox"/> Copies of citations attached</li> <li>14. <input type="checkbox"/> <b>Preliminary Amendment</b></li> <li>15. <input type="checkbox"/> <b>Return Receipt Postcard</b> (MPEP § 503) (Should be specifically itemized)</li> <li>16. <input type="checkbox"/> <b>Certified Copy of Priority Document(s)</b> (if foreign priority is claimed)</li> <li>17. <input type="checkbox"/> <b>Nonpublication Request</b> Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.</li> <li>18. <input type="checkbox"/> <b>Other:</b> _____              _____              _____              _____           </li> </ol>

**\*Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).  
 (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

<b>19. CORRESPONDENCE ADDRESS</b>					
<input checked="" type="checkbox"/> The address associated with Customer Number: <u>34018</u> OR <input type="checkbox"/> Correspondence address below					
Name _____					
Address _____					
City _____		State _____		Zip Code _____	
Country _____		Telephone _____		Email _____	
Signature <b>/Keith R. Jarosik/</b>		Date <b>August 29, 2016</b>			
Name (Print/Type) <b>Keith R. Jarosik</b>		Registration No. (Attorney/Agent) <b>47,683</b>			

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## **GARDENING TOOL**

### **RELATED APPLICATION INFORMATION**

**[0001]** This application claims the benefit of and is a continuation of US Application No. 14/511,490, filed October 10, 2014, which application claims the benefit of CN 201310468919.9, filed on October 10, 2013, and CN 201410167041.X, filed on April 23, 2014, the disclosures of which are incorporated herein by reference in their entirety.

### **FIELD OF THE DISCLOSURE**

**[0002]** The present disclosure relates generally to gardening tools, and more particularly to mowers.

### **BACKGROUND OF THE DISCLOSURE**

**[0003]** A gardening tool such as a mower performs the tool function mainly in a way that a motor of a main body brings functional accessories (e.g., a blade) into operation. Generally speaking, such tools are characterized by higher power and movement of the functional accessories is characterized by high speed and high frequency, which therefore may bring certain hidden danger to an inattentive operator's safety. Currently danger is usually avoided by providing a longer handle to try and keep the operator far away from the main body. However, in order to conveniently receive the mower, the handle is received in a manner such as folding or rotating. In this way, it is possible that when the handle is in a received state and the user is too close to the main body, the user misoperates the switch and thereby starts the mower, whereupon the operator may place themselves into danger by getting too close to the main body.

**[0004]** The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

## **SUMMARY**

**[0005]** In one aspect of the disclosure, a gardening tool includes: a main body at least having a functional accessory and a motor for driving the functional accessory; a handle rotatably connected to the main body and at least having one operation assembly for being operated by a user to control the motor when the handle is in a secure position; and a control system capable of preventing the motor from being controlled by the operation assembly and halting the motor meanwhile when the handle is out of the secure position.

**[0006]** Particularly, the gardening tool is a mower, wherein the motor is an electric motor and the functional accessory is a mowing blade.

**[0007]** The gardening tool, particularly a mower according to the present disclosure can control the motor and the functional accessory comprehensively according to the rotation position of the handle and the instant operation state of the handle. When the handle is in a state of abnormal use, even if the operation assembly on the handle for normally starting operation of the tool is misoperated, the motor and the functional accessory are not driven, and thereby ensure the user's safety and prevent occurrence of danger.

**[0008]** Further areas of applicability will become apparent from the description provided herein. It should be understood that the description and specific examples are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0009]** Fig. 1 is a schematic view of an exemplary gardening tool constructed according to the subject disclosure;

**[0010]** Fig. 2 is a partial schematic view of the tool of Fig. 1;

**[0011]** Fig. 3 is an exploded schematic view of a handle and its angle level

mechanism of the tool of Fig. 1;

**[0012]** Fig. 4 is a schematic view of a level changing member of the tool of Fig. 1;

**[0013]** Fig. 5 is a schematic view illustrating that a telescopic tube does not extend to a designated position in the tool of Fig. 1;

**[0014]** Fig. 6 is a schematic view illustrating that the telescopic tube extends to a designated position in the tool of Fig. 1;

**[0015]** Fig. 7 is a schematic view illustrating that a handle rotates to a designated position in the tool of Fig. 1;

**[0016]** Fig. 8 is a schematic view illustrating that a handle does not rotate to a designated position in the tool of Fig. 1;

**[0017]** Fig. 9 is a schematic view of a control device also constructed according to the subject disclosure; and

**[0018]** Fig. 10 is a schematic view of the portion shown in Fig. 9 when the handle rotates to a designated position.

**[0019]** The drawings described herein are for illustrative purposes only of exemplary embodiments and not all possible implementations, and are not intended to limit the scope of the present disclosure. Corresponding reference numerals indicate corresponding parts throughout the several views of the drawings.

#### **DETAILED DESCRIPTION**

**[0020]** The following description of the preferred embodiments is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

**[0021]** Referring to Fig. 1 through Fig. 10, as a preferred embodiment, a gardening tool according to the present invention is an electric mower 100.

**[0022]** The mower 100 comprises a main body 10, a handle 20 and a control



system. The handle 20 is rotatably connected to the main body 10. The user may achieve accommodation by rotating the handle 20 to adjust an operation posture or reducing space occupied by the mower 100.

**[0023]** The main body 10 comprises a motor and a functional accessory. The functional accessory is used to perform the function of the tool. Regarding the mower 10, the functional accessory is a mowing blade. The motor functions to drive the functional accessory to move in a certain manner to achieve the tool function. Regarding the mower 100, the motor drives the functional accessory to rotate at a high speed. The following description is explained with the motor being an electric motor – which is not intended to be limiting.

**[0024]** To make the user have a comfortable and reliable operating experience, the handle 20 preferably comprises two handle bars. The ends of the handle bars close to the main body 10 are respectively connected to a rotation shaft 21 to achieve rotatable connection with the main body 10, and the ends away from the main body 10 are provided with an operation assembly therebetween. Regarding the mower 100, the operation assembly comprises a trigger B. By operating the trigger B, the user may achieve control of the mower 100 to start or stop the motor. Certainly, the operation assembly may also comprise other operating members such as a button.

**[0025]** The handle 20 at least comprises two telescopic tubes 20a, 20b. Specifically, one telescopic tube 20b forms a sleeve structure, and the other telescopic tube 20a is inserted into the telescopic tube 20b to form a slidable connection so that the telescopic tube 20a can achieve telescoping.

**[0026]** In addition, in a preferred embodiment as shown in Figs. 2, 3 and 5, in order to achieve adjustment of angle level when the handle 20 rotates, the angle level mechanism comprises a level changing member 23 and a locking mechanism 24 and is disposed at the rotation shaft 21 for connecting the handle 20 and the main body 10. The handle 20 is provided with the locking mechanism 24 which is automatically

snap fitted with a plurality of levels of the level changing member 23 so as to fix and adjust the handle 20.

**[0027]** The level changing member 23 is used to set levels and cooperate with the locking mechanism to lock the levels. As a preferred embodiment, the level changing member 23 is a level change locking plate 231 which is in the shape of a plate structure. Certainly, the level changing member may take other forms such as a block shape. Besides, a mounting notch 233 is provided in a lower portion of the level change locking plate 231 so that the rotation shaft 21 will not be hindered upon rotating to change the level. Noticeably, the levels are a plurality of limiting holes 235a, 235b, 235c or an arcuate limiting notch 234 preferably formed on the level change locking plate 231, and the limiting holes 235a, 235b, 235c are located on the two sides of the limiting notch 234.

**[0028]** To better and flexibly adjust and fix the levels, the locking mechanism 24 comprises a level changing assembly for adjusting the levels and a control assembly for controlling the level changing assembly.

**[0029]** The level changing assembly comprises an automatic telescopic pin 241, a pin sleeve 242 and an elastic member 243, wherein the automatic telescopic pin 241 may cooperate with the limiting holes 235a, 235b, 235c and the limiting notch 234 to achieve level locking, the pin sleeve 242 is fixedly connected to an outer pipe 20b and sleeved around the outer periphery of the automatic telescopic pin 241 so as to constitute a slidable connection with the automatic telescopic pin 241, and the elastic member 243 may elastically eject the automatic telescopic pin 241 to the level of the level change locking plate 231 to achieve automatic locking of the level in the absence of an external force.

**[0030]** As a preferred solution, an end of the pin sleeve 242 fixedly connected to the outer pipe 20b is provided with external threads, and the outer pipe 20b is provided with a through hole 247 at the connection between the pin sleeve 242 and

the outer pipe 20b. The through hole 247 is internally processed to form internal threads for mating with the external threads of the pin sleeve 242, so that the pin sleeve 242 is fixedly connected with the outer pipe 20b. Certainly, other methods may also be employed: for example, the portion of the pin sleeve 242 provided with external threads passes through the outer pipe 20b and then is fixedly connected with a nut 246 so as to fixedly connect the pin sleeve 242 and the outer pipe 20b.

**[0031]** To enable the automatic telescopic pin 241 to automatically cooperate with the levels better, a pin limiting structure is formed on the automatic telescopic pin 241, a sleeve limiting structure is formed on the pin sleeve 242, and the elastic member 243 is located between the pin limiting structure and the sleeve limiting structure. Preferably, the elastic member 243 is a spiral spring, the pin limiting structure is an annular step formed on an outer periphery of the automatic telescopic pin 241, and the sleeve limiting structure is an annular step formed in the pin sleeve 242. As such, one end of the spiral spring abuts against the pin limiting structure, and the other end abuts against the sleeve limiting structure so that the automatic telescopic pin 241 tends to move towards the level of the level changing member to achieve automatic level locking.

**[0032]** Upon level change operation, the automatic telescopic pin 241 needs to retreat out of a level and move, whereby the control assembly is needed to bring the automatic telescopic pin 241 to move.

**[0033]** The control assembly comprises an operation member 244 and a fixing member 245, wherein the operation member 244 is an executing member used by the operator to achieve level adjustment, and the operation member 244 is provided with an anti-skid structure at an end thereof to be manually held so that that the operator may control the operation member 244 more reliably. The automatic telescopic pin 241 passes through the pin sleeve 242 and the outer pipe 20b and is rotatably connected to the other end of the operation member 244. Preferably, a shaft hole is formed at the connection between the automatic telescopic pin 241 and the operation

member 244, and a shaft is inserted into the shaft hole to rotatably connect the automatic telescopic pin 241 and the operation member 244.

**[0034]** The fixing member 7 is fixedly connected to the outer pipe 20b provided with the through hole 247, and the operation member 244 is rotatably connected to the fixing member 245. To allow for rotatable connection between the operation member 244 and the fixing member 245, as a preferred solution, a connection shaft hole 240 is formed on both the fixing member 245 and the operation member 244, and upon installation, a rotation shaft is inserted into the connection shaft hole 240 to form the rotatable connection. The resultant rotatable connection is not only firm and reliable, but also simple in structure and easy to install. As such, the operation member 244 is formed as a lever with a location for connection with the fixing member 245 as a pivot point. When an external force drives the anti-skid handle of the operation member to approach the outer pipe 20, the automatic telescopic pin 241, due to the action of the operation member 244, is forced to move away from the level changing member and retract out of the level to get ready for level adjustment.

**[0035]** To further improve convenience in use, the operation assembly further comprises a return member 248 enabling the operation member 244 to return automatically in the absence of an external force. Preferably, the return member 248 may be a torsion spring sleeved around the outer periphery of the rotation shaft. One end of the torsion spring abuts against the operation member 244, and the other end thereof abuts against the fixing member 7 or the outer pipe 20b fixedly connected to the fixing member 245. Therefore, in the absence of the external force, elastic energy of the torsion spring drives the operation member 244 to achieve automatic return. Certainly, the return member 248 here may also be designed based on magnetic energy, which is a readily-envisaged variation and not detailed herein.

**[0036]** The above depictions have introduced a multi-level operation handle mechanism capable of achieving automatic level change conveniently and reliably. A protective cover 249 is mounted outside the outer pipe 20b mounted with the pin

sleeve 242 to protect the multi-level operation handle mechanism and the mower and provide a more pleasant and compact appearance.

**[0037]** To make the level change locking plate 231 more firmly fixed to a main body of the mower, the level change locking plate 231 bends and extends in a direction parallel to the rotation shaft 21 to form a stopping structure 232. The main body of the mower is provided with a mounting structure for cooperating with the stopping structure 232. The mounting structure may be, but need not be limited to, a groove integrally formed with the main body of the mower and configured to accommodate the stopping structure 232. As such, the level change locking plate 231 is fixed on the main body of the mower via screws. Furthermore, the cooperation of the stopping structure 232 and the mounting structure can effectively prevent displacement and ensure very reliable installation and limiting of the stopping structure 232 and the mounting structure.

**[0038]** As a preferred embodiment, the levels comprise limiting holes 235a, 235b, 235c and a limiting notch 234, wherein there are three limiting holes with two of them being adjacent to each other and located on the same side of the limiting notch 14. A first height level 235a and a second height level 235b are used to adjust the height of the operation handle upon normal use of the mower to meet the needs of different user groups with different heights, and the remaining limiting hole 235c is arranged on the other side of the limiting notch 234 and used as an accommodating level for folding the handle upon accommodating the mower. The limiting notch 234 is a movable level having an arc-shaped end and allowing the automatic telescopic pin 241 to move upon grass dumping operation.

**[0039]** The control system is used to ensure security when the user is using the mower 100, and it at least can lock the motor so that the motor is not controlled by the operation assembly when the handle 20 does not rotate to a designated position, thus the motor remains in a stop state and not started.

**[0040]** The advantage of this configuration is that when the handle 20 does not rotate to the designated position (generally a working position of the handle 20, the position of the handle 20 in Fig. 1), it can be ensured that even though the user misoperates the operation assembly, e.g., inadvertently pulls the trigger B, the motor is locked and cannot be started, thereby preventing accidental movement from causing injury to the user's body. That is because when the handle 20 does not rotate to the designated position, the user has not gotten ready for mowing and he might be in a dangerous position and vulnerable to injury.

**[0041]** In consideration of the above and in order to consider all possible risks upon use of the mower to provide security and protection to the user, the control system comprise at least two control devices, wherein one control device can control the motor only when the remaining control devices all are in a designated state.

**[0042]** As such, only when the control devices responsible for monitoring risk items all are in a designated state corresponding to absence of danger can the control device in the control system initiatively controlled by the user be unlocked to achieve its function. If one control device responsible for monitoring risk items is in a state corresponding to presence of danger, it locks the control device in the control system initiatively controlled by the user so that the user cannot start the motor, and stops the running motor and functional accessory in case that the motor is running.

**[0043]** Preferably, the control system comprises a first control device controlled by the user via the operation assembly. The first control device can be operated by the user to start the motor only when the remaining control devices in the control system all are in the designated state. The first control device is a user end control device that can be locked by any other control devices responsible for monitoring risk items in the control system.

**[0044]** The first control device may comprise a first switch or a first signal source device, or a combination thereof.

**[0045]** Generally, to achieve control of the user end, only one first switch or one first signal source device is needed. However, for the sake of security, to make sure that the user's operation is indeed intended to start the mower 100 and ensure safety, the first control device comprises a plurality of first switches and a plurality of first signal source devices, preferably two first switches, wherein one first switch is a contact switch that can be triggered by the trigger B and connected in series in a power supply circuit of the motor, and the motor is not powered when it is switched off, and it switches on the circuit when it is triggered by the trigger B. The other first switch is a position switch which is also connected in series in the power supply circuit of the motor, and it switches on the circuit when it detects that the trigger B moves to a corresponding position. As such, security guarantee may be increased by determining double control.

**[0046]** Certainly, one first signal source device may be set. This first signal source device may be a photoelectric switch which participates in control by sending a control signal to the switch in the power supply circuit. The photoelectric switch may be used to detect the user's operation action or detect whether there is an obstacle in an advancement direction of the mower 100.

**[0047]** Preferably, the first switch is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch, and the first signal source device is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch.

**[0048]** Referring to Fig. 1, as the simplest solution, the first control device only comprises one first switch which is connected in series in the power supply circuit. The first switch is a contact switch SW that can be controlled by the trigger B.

**[0049]** The risk items monitored by the control device may comprise: an angle of the handle relative to the main body, telescopic situations of the telescopic tubes, electric power source temperature, motor temperature and blocked rotation.

**[0050]** When the angle of the handle relative to the main body is taken as the risk

item to be monitored, the control system comprises a second control device that can be controlled by the handle according to its rotation. When the handle rotates to a designated position relative to the main body, the second control device unlocks the first control device so that the first control device can start the motor, and when the handle rotates to a position other than the designated position relative to the main body, the second control device locks the first control device so that the first control device cannot start the motor.

**[0051]** The second control device comprises a second switch or a second signal source device, or a combination thereof. The second switch is connected in the power supply circuit, and the second signal source device can send a control signal to the power supply circuit.

**[0052]** The second switch is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch; and the second signal source device is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch.

**[0053]** Referring to Fig. 2, Fig. 7 and Fig. 8, as a preferred solution, the second control device only comprises a second switch disposed at the rotation shaft of the handle. The second switch is a contact switch SW1 secured to the main body 10. A contact is provided on one side of the second switch towards the rotation shaft 21. A trigger member 22 is provided at a location in the axial direction of the rotation shaft 21 corresponding to the contact switch SW1. When the handle 20 brings the rotation shaft 21 to rotate, the trigger member 22 triggers the contact of the contact switch SW1 when it rotates to a designated angle (generally, when the handle 20 rotates to a designated secure position).

**[0054]** As shown in Fig. 9 and Fig. 10, as another preferred solution, the second control device only comprises a second switch disposed at the rotation shaft of the handle. The second switch is a contact switch SW1'. The contact switch SW1' is mounted on the handle 20' and rotates along with it. A contact of the contact switch



SW1' faces towards a main body 10'. The main body 10' is provided with a fixed trigger member 22'. A slant surface F is formed on one side of the trigger member 22' opposite to the handle 20'. When the handle 20' rotates, the contact switch SW1' rotates along with it. When the handle 20' rotates to a certain angle, the slant surface F gradually presses the contact of the contact switch SW1' along with the rotation, and when the handle 20' rotates to a designated angle, the slant surface F completely triggers the contact switch SW1'.

**[0055]** When the telescopic situation of the telescopic tube is taken as the risk item to be monitored, the control system further comprises a third control device. The third control device can be controlled by a telescopic action of one telescopic tube 20a. When the telescopic tube extends to a designated position relative to the other telescopic tube, the third control device unlocks the first control device so that the first control device can start the motor, and when the telescopic tube extends to a position other than the designated position, the third control device locks the first control device so that the first control device cannot start the motor.

**[0056]** The third control device comprises a third switch or a third signal source device, wherein the third switch is connected in the power supply circuit, and the third signal source device can send a control signal to the power supply circuit.

**[0057]** Preferably, the third switch is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch; and the third signal source device is one of a contact switch, a proximity switch, a Hall switch and a photoelectric switch.

**[0058]** As shown in Fig. 5 and Fig. 6, as a preferred solution, the third control device only comprises a second switch disposed at an end of the telescopic tube 20b. The second switch is a contact switch SW2. The telescopic tube 20b is a sleeve structure. A contact P of the contact switch SW2 penetrates a pipe wall of the telescopic tube 20b and extends into the sleeve structure. The telescopic tube 20a is inserted into the telescopic tube 20b, and a trigger member 20a' is disposed at a

bottom end of the telescopic tube 20a. When the telescopic tube 20a is drawn out of the telescopic tube 20b (i.e., when the handle 20 is in an extended state), the trigger member 20a' triggers the contact P of the contact switch SW2 via contact.

**[0059]** Preferably, the contact switch SW, the contact switch SW1 and the contact switch SW2 all are connected in series on the same line of the power supply circuit. When one of the contact switch SW1 and the contact switch SW2 switches off, no matter whether the contact switch SW is triggered by the trigger B to be in an off or on state, the power supply circuit cannot communicate with the line to allow the electric power source to provide electrical energy to the motor, thereby achieving safety protection.

**[0060]** As a preferred solution, in order to prevent the functional accessory from moving due to inertia and thereby causing injury to the user after the motor turns off, the mower 100 further comprises a brake system configured to brake the mowing blade by physical contact. The brake system can brake the functional accessory at least when the control system controls the motor to stop.

**[0061]** Specifically, any one of the control devices controls the motor to turn off, and then the control system controls the brake system to stop the mowing blade from continuing to move due to the inertia, thereby achieving urgent braking. Such braking may be achieved by contacting the mowing blade or by contacting a transmission member fixedly connected thereto.

**[0062]** In the brake system, electrical control of entity devices may be achieved by attraction and release of an electromagnet.

**[0063]** The above illustrates and describes basic principles, main features and advantages of the present invention. Those skilled in the art should appreciate that the above embodiments do not limit the present invention in any form. Technical solutions obtained by equivalent substitution or equivalent variations all fall within the scope of the present invention.

## CLAIMS

What is claimed is:

1. A gardening tool, comprising:

- a main body having at least a functional accessory and a motor for driving the functional accessory;

- a handle, rotatably connected to the main body, having at least one operation assembly for being operated by a user to control the motor when the handle is in a secure position;

- a locking mechanism for locking the rotating position of the handle;

- a locking member configured to engage with the locking mechanism and providing at least a locking structure to cause the locking mechanism to keep the handle at an accommodating position relative to the main body when the gardening tool is not being used; and

- a control system capable of preventing the motor from being controlled by the operation assembly and halting the motor when the handle is out of the secure position, the control system comprising:

- a first control device configured to be controlled by the operation assembly; and

- a second control device configured to be controlled according to the rotating position of the handle wherein, when the handle rotates to a designated position relative to the main body, the second control device unlocks the first control device so that the first control device allows starting of the motor, and, when the handle rotates to the accommodating position relative to the main body, the second control device locks the first device so that the first control device is not allowed to start the motor; and

- wherein the second control device comprises at least one of a switch connected to the power supply circuit and a signal source device for sending a control signal to control the motor.

2. The gardening tool as recited in claim 1, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a switch connected to the power supply circuit to connect the electric power source to the motor or disconnect the electric power source to the motor.
3. The gardening tool as recited in claim 2, wherein the switch is mounted to the handle and rotates with the handle synchronously.
4. The gardening tool as recited in claim 2, wherein the switch is mounted to the main body and the handle rotates relatively to the switch.
5. The gardening tool as recited in claim 1, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a signal source for sending a control signal to the power supply circuit to disconnect the electric power source to the motor.
6. The gardening tool as recited in claim 5, wherein the signal source is mounted to the handle and rotates with the handle synchronously.
7. The gardening tool as recited in claim 5, wherein the signal source is mounted to

CHI 67331731v1

the main body and the handle rotates relatively to the signal source.

8. The gardening tool as recited in claim 1, wherein the handle comprises a plurality of telescopic members for connecting the operation assembly to the main body, and wherein, when a one of the plurality of telescopic members extends to the designated position relative to another of the plurality of telescopic members, a third control device unlocks the first control device so that the first control device is capable of starting the motor, and, when the one of the plurality of telescopic members is in a position other than the designated position, the third control device locks the first control device so that the first control device is not capable of starting the motor.

9. The gardening tool as recited in claim 8, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a switch and a signal source, the switch is configured to be triggered by the operation assembly to activate the motor, and the signal source sends a signal to the power supply circuit to disable the activation of the motor when the one of the plurality of telescopic members is caused to be move away from the predetermined position relative to the another of the plurality of telescopic members.

10. The gardening tool as recited in claim 8, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide

*CHI 67331731v1*

power to the motor wherein the control system comprises a plurality of signal sources for sending a signal to the power supply circuit to control the connection between the electric power source and the motor, the plurality of signal sources enable the operation of the operation assembly to the motor when the one of the plurality of telescopic members is caused to move to a predetermined position relative to another of the plurality of telescopic members and the one of the plurality of signal sources disable the operation of the operation assembly to the motor when the one of the plurality of telescopic members is caused to be move away from the predetermined position relative to the another of the plurality of telescopic members.

11. A mower, comprising:

- a main body having at least a functional accessory and a motor for driving the functional accessory;

- a handle, rotatably connected to the main body, having at least one operation assembly for being operated by a user to control the motor when the handle is in a secure position;

- a locking mechanism for locking the rotating position of the handle;

- a locking member configured to engage with the locking mechanism and providing at least a locking structure to cause the locking mechanism to keep the handle at an accommodating position relative to the main body when the mower is not being used; and

- a control system capable of preventing the motor from being controlled by the operation assembly and halting the motor when the handle is out of the secure position, the control system comprising:

- a first control device configured to be controlled by the operation

assembly, and

a second control device configured to be controlled according to the rotating position of the handle wherein, when the handle rotates to a designated position relative to the main body, the second control device unlocks the first control device so that the first control device allows starting of the motor, and, when the handle rotates to the accommodating position relative to the main body, the second control device locks the first device so that the first control device is not allowed to start the motor, and

wherein the second control device comprises at least one of a switch connected to the power supply circuit and a signal source device for sending a control signal to control the motor.

12. The mower as recited in claim 11, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a switch connected in the power supply circuit to connect the electric power source to the motor or disconnect the electric power source to the motor.

13. The mower as recited in claim 12, wherein the switch is mounted to the handle and rotates with the handle synchronously.

14. The mower as recited in claim 12, wherein the switch is mounted to main body and the handle rotates relatively to the switch.

15. The mower as recited in claim 11, further comprising an electric power source and

a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a signal source for sending a control signal to the power supply circuit to disconnect the electric power source to the motor.

16. The mower as recited in claim 15, wherein the signal source is mounted to the handle and rotates with the handle synchronously.

17. The mower as recited in claim 15, wherein the signal source is mounted to main body and the handle rotates relatively to the signal source.

18. The mower as recited in claim 11, wherein the handle comprises a plurality of telescopic members for connecting the operation assembly to the main body, and wherein, when a one of the plurality of telescopic members extends to the designated position relative to another of the plurality of telescopic members, a third control device unlocks the first control device so that the first control device is capable of starting the motor, and, when the one of the plurality of telescopic members is in a position other than the designated position, the third control device locks the first control device so that the first control device is not capable of starting the motor.

19. The mower as recited in claim 18, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a switch and a signal source, the switch

*CHI 67331731v1*



is configured to be triggered by the operation assembly to activate the motor, and the signal source sends a signal to the power supply circuit to disable the activation of the motor when the one of the plurality of telescopic members is caused to be move away from the predetermined position relative to the another of the plurality of telescopic members.

20. The mower as recited in claim 18, further comprising an electric power source and a power supply circuit for enabling the electric power source to provide power to the motor wherein the control system comprises a plurality of signal sources for sending signal to the power supply circuit to control the connection between the electric power source and the motor, the plurality of signal sources are capable of enabling the operation of the operation assembly to the motor when the one of the plurality of telescopic members is caused to move to a predetermined position relative another of the plurality of telescopic members and the one of the plurality of signal sources is capable of disabling the operation of the operation assembly to the motor when the one of the plurality of telescopic members is caused to be move away from the predetermined position relative to the another of the plurality of telescopic members.

## ABSTRACT

An gardening tool, such as a mower, includes a main body and a handle rotatably connected to the main body. The main body includes a motor. The handle includes a plurality of telescopic members slidably connected to each other. The mower further includes a operation assembly for being operated by a user to activate the motor and a control system for sending a control signal to enable or disable the operation of motor by the operation assembly when the handle is out of a accommodating state.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

34018

**OR**

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

34018

**OR**

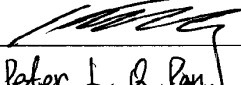
<input type="checkbox"/>	Firm or Individual Name			
<input type="checkbox"/>	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: CHERVON INTELLECTUAL PROPERTY LIMITED  
P.O. Box 957, Offshore Incorporations Centre  
Road Town, Tortola, British Virgin Islands

**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.**

**SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	July 4, 2014
Name	Peter L. Q. Pan	Telephone	
Title	Manager Director		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

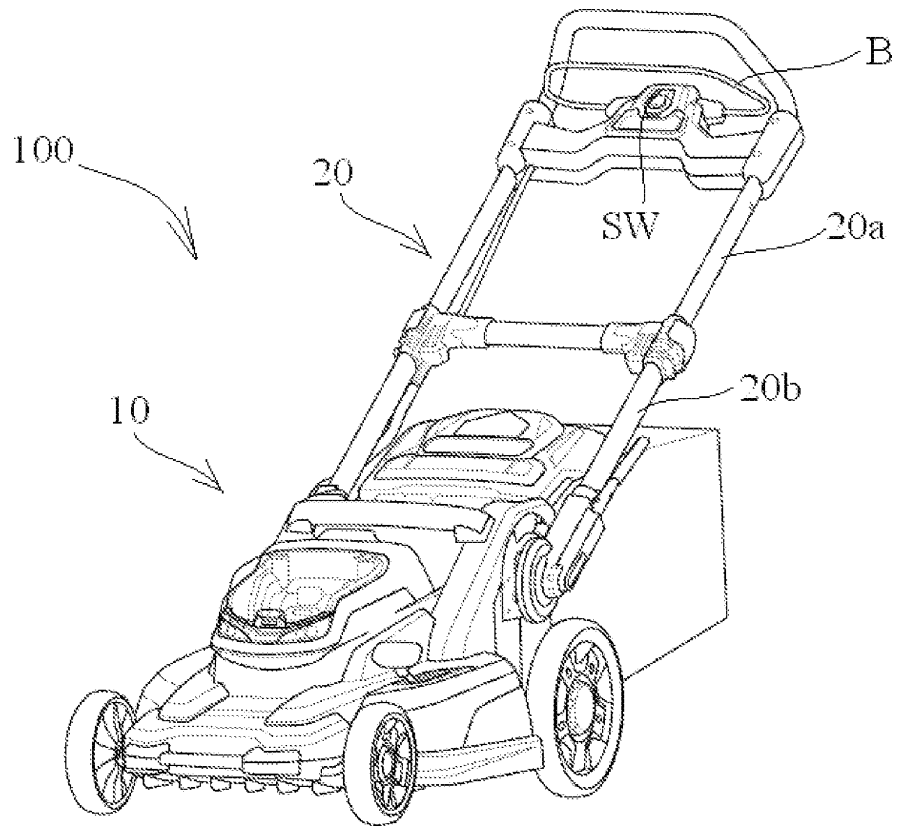


FIG.1

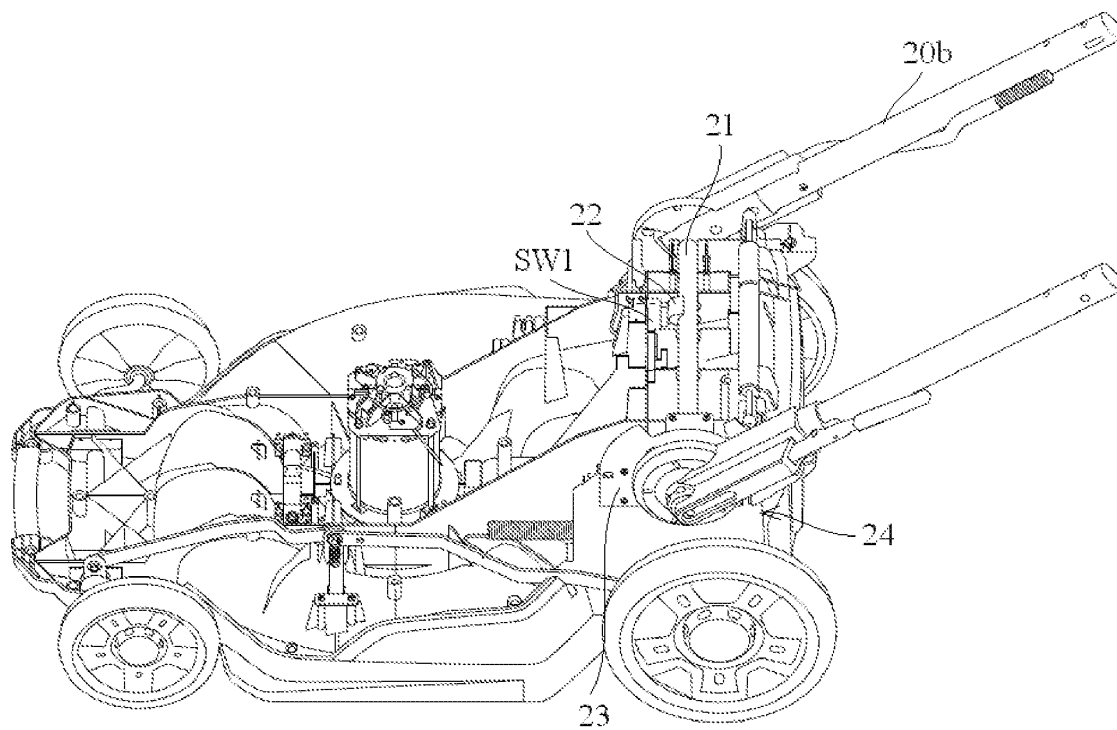


FIG. 2

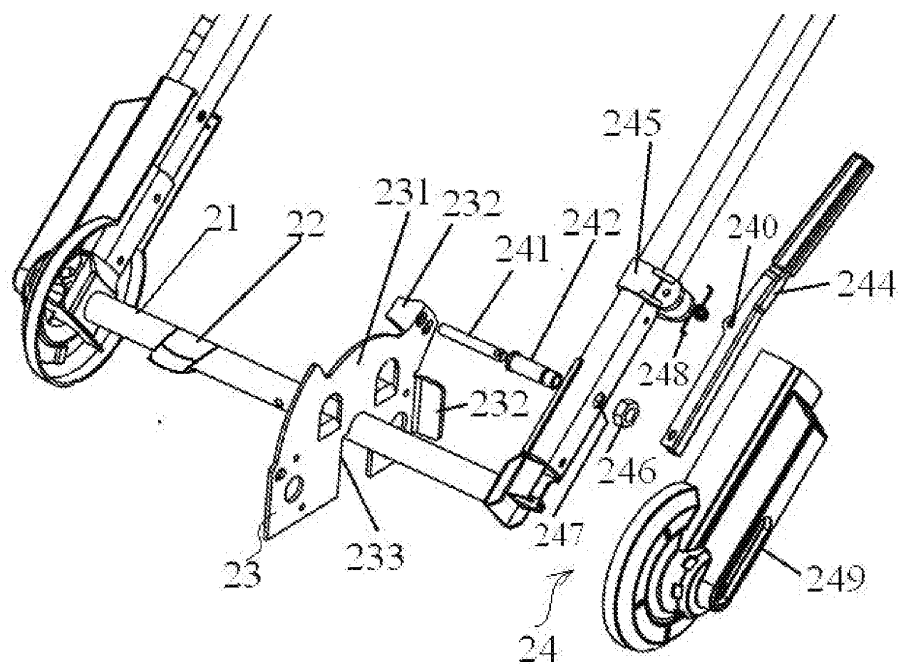


FIG.3

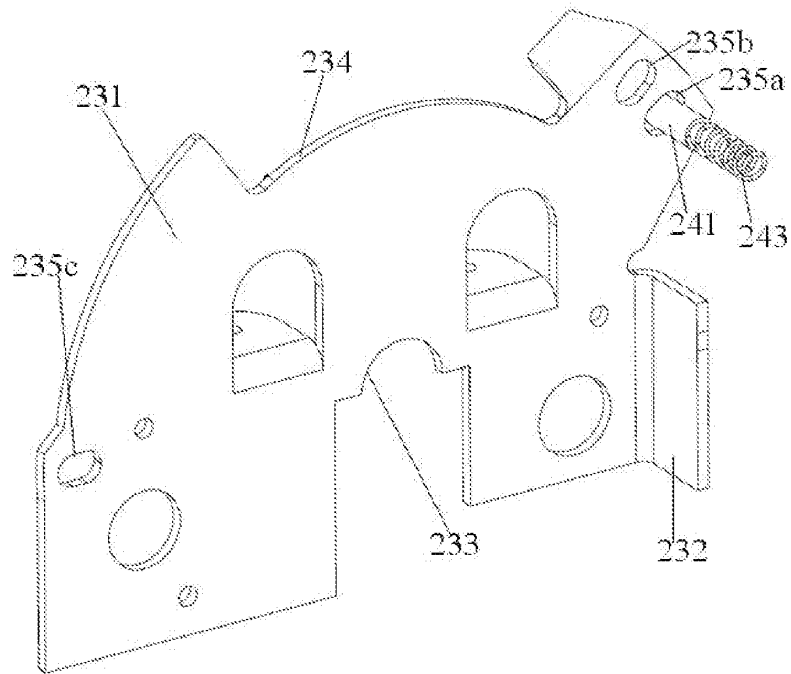


FIG.4

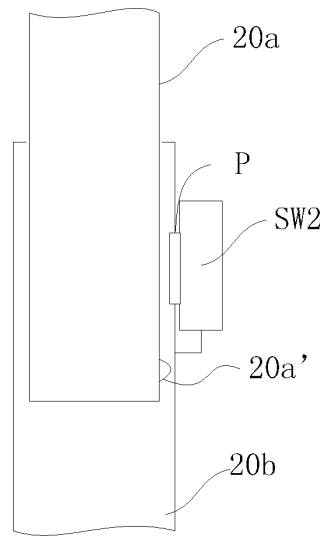


FIG.5

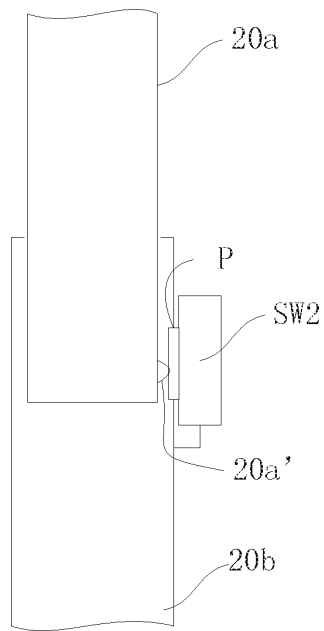


FIG. 6

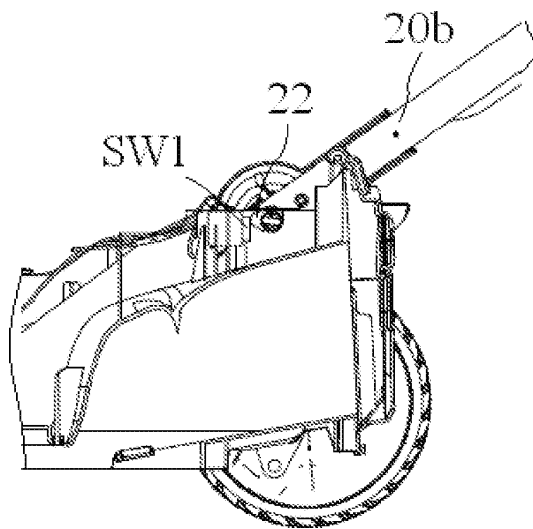


FIG. 7



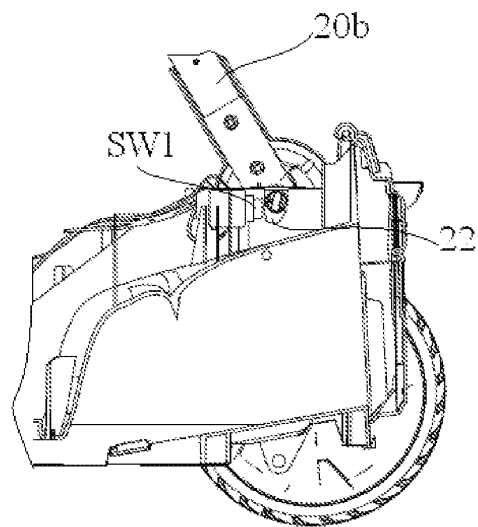


FIG. 8

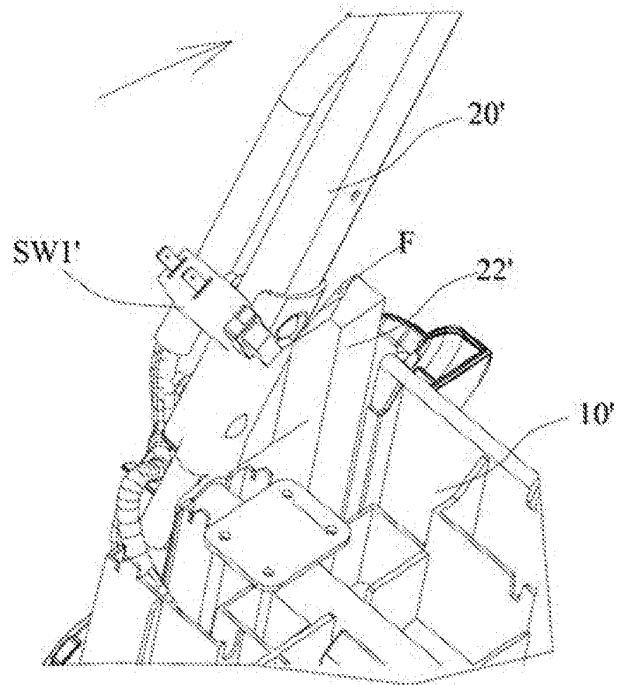


FIG. 9

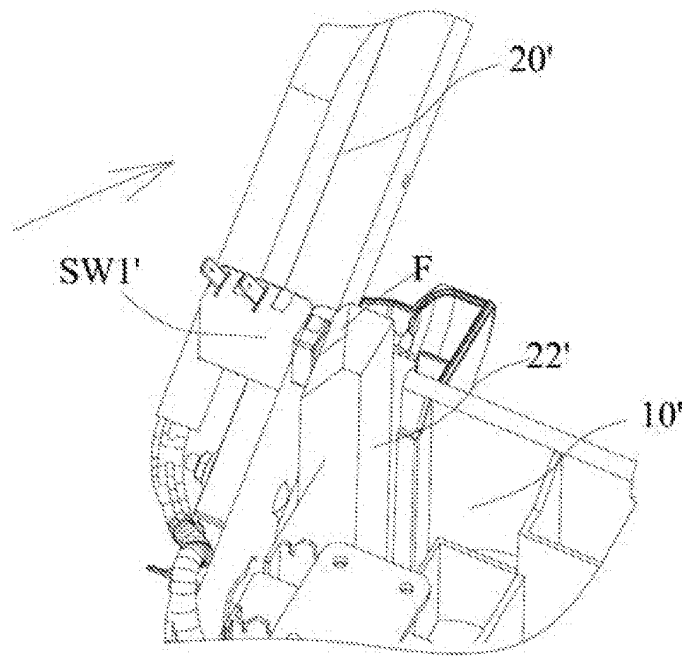


FIG.10

**PATENT ASSIGNMENT AND DECLARATION**

WHEREAS, we, Toshinari Yamaoka of 16-704 Renheng Bamboo Garden, No. 5 Yulan Road, Yuhua District, Nanjing, Jiangsu Province, P. R. China; Fangjie Nie of Room 402 Biboge, Culture Country, No. 88 Tianyuan Road, Jiangning District, Nanjing, Jiangsu Province, P. R. China; and Haishen Xu of Room 302, No. 32, Rehe South Road, Xiaguan District, Nanjing, Jiangsu Province, P. R. China; have invented a certain new and useful invention entitled **GARDENING TOOL, PARTICULARLY MOWER** for which a patent application has been prepared for filing with the United States Patent & Trademark Office, which has been assigned application number 14/\_\_\_\_\_.

**I. ASSIGNMENT**

NOW THEREFORE, be it known that for good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, we, hereby sell and assign to **CHERVON INTELLECTUAL PROPERTY LIMITED**, ("Assignee"), a British Virgin Islands corporation, having its principal place of business at Offshore Incorporations Centre, Road Town, Tortola, British Virgin Islands, its successors, assigns, nominees, or other legal representatives, the entire right, title, and interest in and to the invention invented by me, and the application for United States patent therefor, the declaration, and all original and reissued patents granted therefor, and all divisions and continuations thereof, including the subject-matter of any and all claims which may be obtained in every such patent, and the right to apply for and obtain patents and Utility Model Registrations which may be granted thereon in such foreign countries, and authorize and request the Commissioner of Patents and Trademarks of the United States, and any official of any other country or countries foreign to the United States whose duty it is to issue patents on applications as aforesaid, to issue said Letters Patent or Utility Model Registration to the said Assignee, its successor, assigns, nominees, or other legal representatives, as assignee of the entire interest herein assigned. We covenant that we have not executed and will not execute any agreement in conflict herewith and agree that we will communicate to said Assignee, its successors, assigns, nominees, or other legal representatives, all facts known to us respecting said invention, whenever requested, and testify in any legal proceedings, sign all lawful papers, execute all divisional, continuing, and reissue applications, make all rightful oaths, and do all lawful acts requisite for the application for such divisional, continuing, or reissue applications, or the procuring thereof, and that if and when said Assignee, its successors, assigns, nominees, or other legal representatives desire to file a disclaimer relating thereto, we will, upon request, sign all lawful papers requisite for the filing of such disclaimer. We further covenant and agree that we will, at any time upon request, do everything legally possible to aid said Assignee, its successors, assignees, nominees, or other legal representatives, either in its or their own names, to apply for, obtain, and enforce proper patent and/or Utility Model protection for said invention in all countries, all without further consideration but at the expense of said Assignee, its successors, assigns, nominees, or other legal representatives.

ASSIGNOR hereby grants to the law firm of GREENBERG TRAURIG, LLP of Chicago, Illinois, authority and power to insert on this instrument any further identification which may be necessary or desirable for purposes of recordation in the United States Patent Office or the Patent Office of any foreign country.

**II. DECLARATION**

**Inventor 1**

As the below named inventor, I hereby declare that:

This declaration is directed to:

✓ the attached application, or

\_\_\_\_\_ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of October, 2014.

Toshinari Yamada  
Toshinari Yamada (signature)

Witness:

[Signature]

(signature)

Dan Gao

(printed name)

**Inventor 2**

As the below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

☐ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

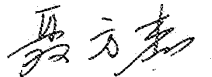
The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of October, 2014.



\_\_\_\_\_  
Fangjie Nie (signature)

Witness: 

\_\_\_\_\_  
(signature)  
Dan Gao

\_\_\_\_\_  
(printed name)

Inventor 3

As the below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

☐ United States application or PCT international application number

\_\_\_\_\_ filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.


I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims; and I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known by me to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 9 day of  
October, 2014.

  
Haishen Xu (signature)

Witness:   
\_\_\_\_\_  
(signature)  
Dan Gao  
\_\_\_\_\_  
(printed name)

CHI 65206160v1

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	78873.176US2	

U.S. PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S. PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.								
FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup>	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1	0903074	EP	A1	1999-03-24	Wolf Outils		<input type="checkbox"/>
If you wish to add additional Foreign Patent Document citation information please click the Add button								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T <sup>5</sup>

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	78873.176US2	

	1		<input type="checkbox"/>
--	---	--	--------------------------

If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2016-08-29
	First Named Inventor	Toshinari Yamaoka	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		78873.176US2

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Keith R. Jarosik/	Date (YYYY-MM-DD)	2016-08-29
Name/Print	Keith R. Jarosik	Registration Number	47683

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Yamaoka et al.	)	
	)	
Serial No.: Filed herewith	)	Examiner:
	)	
Filed: Filed herewith	)	Group Art Unit:
	)	
Title: GARDENING TOOL	)	Docket No. 078873.176US2

**CERTIFICATION STATEMENT**

**FILED VIA EFS-WEB**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

The Information Disclosure Statement being filed concurrently herewith should be considered because it is submitted, pursuant to 37 C.F.R. §1.97(b)(3) before the mailing of a first Office Action on the merits. Therefore, no fee is required.

Respectfully submitted,

Date: August 29, 2016

By: /Keith R. Jarosik/  
Keith R. Jarosik, Reg. No. 47,683  
Greenberg Traurig, LLP  
77 W. Wacker Drive - Suite 3100  
Chicago, Illinois 60601  
(312) 456-8400

CHI 67359832v1

-----  
**Certificate of Electronic Transmission:** The undersigned hereby certifies that this document and its attachments are being transmitted electronically via EFS-Web to the United States Patent and Trademark Office on this 29<sup>th</sup> day of August, 2016.

By: /Cynthia Tapia/  
Name: Cynthia Tapia



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) EP 0 903 074 A1

(12) DEMANDE DE BREVET EUROPEEN

(43) Date de publication:  
24.03.1999 Bulletin 1999/12

(51) Int. Cl. A01D 34/70

(21) Numéro de dépôt: 98440208.1

(22) Date de dépôt: 11.09.1998

(84) Etats contractants désignés:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE  
Etats d'extension désignés:  
AL LT LV MK RO SI

(30) Priorité: 12.09.1997 FR 9711530  
14.04.1998 FR 9804790

(71) Demandeur: Outils Wolf (Société Anonyme à  
Directoire et Conseil de Surveillance)  
67160 Wissembourg (FR)

(72) Inventeurs:  
• Les inventeurs ont renoncé à leur désignation

(74) Mandataire: Nuss, Pierre et al  
10, rue Jacques Kabié  
67080 Strasbourg Cédex (FR)

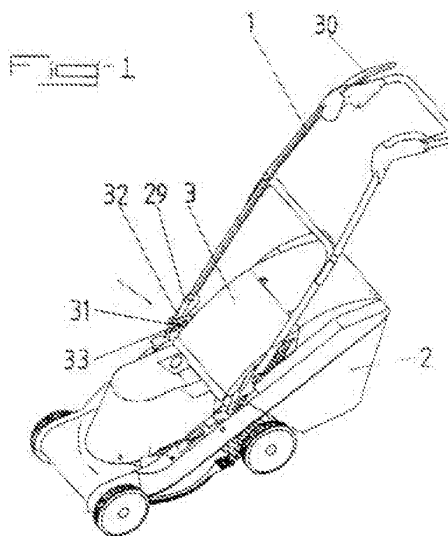
(54) Tondeuse à gazon comportant un dispositif de sécurité prévenant contre l'accès à la lame de coupe en rotation

(57) La présente invention concerne une tondeuse à gazon, en particulier poussée ou autotractée munie d'un guidon (1), comprenant un dispositif de coupe qui peut assurer le ramassage de l'herbe coupée à travers un conduit d'éjection dans un réceptacle (2) disposé à l'arrière et comportant un dispositif de sécurité prévenant contre l'accès à la lame de coupe en rotation.

Tondeuse caractérisée en ce que le dispositif de sécurité est constitué par un couvercle de sécurité (3) articulé sur la tondeuse, formant détecteur lors d'une ton-

te sans ramassage de l'herbe et/ou assurant la fermeture supérieure du réceptacle (2) de réception de l'herbe coupée, solidaire avec le guidon (1) de la tondeuse, lors du pivotement de ce dernier, et par un moyen (28) de commande du déclenchement ou de l'entraînement en rotation de la lame de coupe.

L'invention est plus particulièrement applicable dans le domaine de la construction de tondeuses à gazon, en particulier poussées ou autotractées.



Printed by Jouve, 75001 PARIS (FR)

EP 0 903 074 A1



Espacenet

Bibliographic data: EP0903074 (A1) — 1999-03-24

Lawnmower with a safety device to prevent access to the rotating cutter blade

Inventor(s):

Applicant(s): WOLF OUTILS [FR] ± (OUTILS WOLF (SOCIETE ANONYME A DIRECTOIRE ET CONSEIL DE SURVEILLANCE))

Classification: - international: A01D43/063; A01D34/63; (IPC1-7): A01D34/67; A01D34/82  
- cooperative: A01D34/824; A01D43/0631; A01D2101/00; A01D34/63

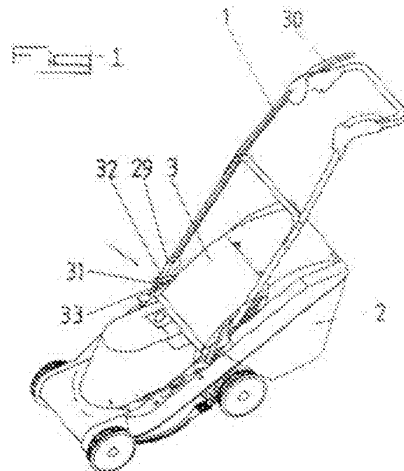
Application number: EP19980440208 19980911

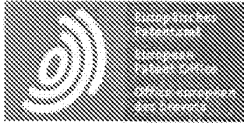
Priority number(s): FR19970011530 19970912 ; FR19980004790 19980414

Also published as: EP0903074 (B1); ES2130109 (T1); ES2130109 (T3); P7303074 (E); DE903074 (T1)  
more

Abstract of EP0903074 (A1)

The grass collector (2) has a safety cover (3) which acts as a deflector when the collector is not filled. The cover is connected to the mower blade drive motor or to a clutch which cuts out the drive or disengages the blade when the cover is raised, so that the blade stops rotating automatically. The connection between the safety cover and drive motor or clutch is made via a lug (33) on the side of the cover and a pivoted hook (32) on the handle (1) linked to the motor or clutch control cable (29). When the cover is raised or the handle is moved forward the hook is turned and the drive is stopped or the clutch disengaged.





## Patent Translate

Powered by EPO and Google

### Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

### DESCRIPTION EP0903074

[0001]

The present invention relates to the field of construction of lawn mowers, in particular pushed or self-propelled comprising a cutting device which convey the cut grass through an ejection duct into a receptacle arranged at the rear, and relates to such a mower with a safety device to prevent against access to the rotating cutting blade.

[0002]

grass receiving receptacles generally cut equipping lawnmowers of this type are most often in the form of a basket or a rigid or flexible bag are hung behind the mower on the exit of the exhaust pipe cut grass. These baskets or bags may present a higher opening facilitating drainage and covered, for mowing, by solidarity cover from the back of the mower and forming a deflector during a mowing without grass collection.

[0003]

However, if these existing collection receptacles are satisfactory as regards the reception capacity

of the cut grass, handling is relatively difficult, because their attachment is done under the handlebar, preventing easy access, said handlebars being generally blocked in its service position.

[0004]

In addition, the baffle-cover provided above the outlet of the ejection pipe complicated maneuvers stall and snap, requiring the lifting or manual maintenance during such maneuvers.

[0005]

Although the rotation of the cutting blade be subject to a hold-to-safety control, the risk of injury from projections or accidental introduction of a member in the cutting area does little to be completely avoided, the fact that actuation of this control is left to the decision of the user.

[0006]

Also known by US-A-4,753,062 a lawnmower provided with a pivotable and lockable handlebar and a cut grass receiving basket lid connected to said handlebar by a link, so that said lid follows said handlebar in its movement. Furthermore, this mower is provided with a safety device acting on the operation control means to stop the motor and therefore of the cutting blade.

[0007]

However, this safety feature, which ensures the engine is stopped by grounding the ignition can be faulted for any disconnection or rupture of a conductor.

[0008]

The present invention aims to overcome these disadvantages by providing a lawnmower, in particular pushed or self-propelled, equipped with handlebars, including a cutting device which can

ensure the collection of grass clippings through the duct ejection into a receptacle arranged at the rear and comprising a safety device preventing against access to the rotating cutting blade to ensure easy hooking and unhooking of the receiving receptacle of the cut grass and ensuring the user against injury during these operations or between operations.

[0009]

To this end, the lawn mower is characterized in that the safety device is constituted by a hinged safety cover on the mower baffle during mowing without grass collection and / or providing the upper closure of the receptacle for receiving cut grass, for fixing to the handlebar of the mower during the pivoting of the latter, and a trigger control means or the driving in rotation of the cutting blade.

[0010]

The invention will be better understood from the following description which relates to preferred embodiments, given as nonlimiting examples, and explained with reference to the accompanying diagrammatic drawings in which: Figure 1 is a perspective view of a mower equipped view of the device according to the invention, in operating position; Figure 2 is a partial side elevational view, on a larger scale, showing a first embodiment of the safety device; Figure 3 is a partial side elevational view of the rear portion of a mower equipped with the apparatus of Figure 2, with release of the operating positions in cutting blade and folding forward of the handlebar; Figure 4 is a view similar to that of Figure 3, the cutting blade remaining engaged in service and folding positions forward of the handlebar; Figure 5 is a view similar to that of the figurative 1 showing a variant embodiment of the safety device, the lawnmower is in the pivoting position of the cover upward;

Figures 6 and 7 are partial perspective views, on a larger scale, showing the handle of the locking means on the mower housing; Figure 8 is a schematic view showing the operation of the triggering means of the cutting means; 9 is a partial schematic view showing the removable link variant, and Figures 10 and 11 are partial schematic views showing different embodiments of the cutting blade trigger means.

[0011]



1 and 5 of the accompanying drawings show by way example, a lawnmower, in particular pushed or self-propelled, provided with a handlebar 1 and comprising a cutting device which can ensure the collection of the cut grass through an ejection duct into a receptacle 2 placed on the back. This lawn mower comprises, furthermore, a safety device preventing against access to the rotating cutting blade. In the embodiment shown, this mower is electric push type, but it could also be the type of self-propelled with electric motor or combustion engine.

[0012]

According to a first embodiment of the invention, more particularly shown in Figures 1 to 4 of the accompanying drawings, this safety device comprises a safety cover 3 hinged to the tortuous baffle during mowing without the grass and / or providing the upper closure of the receptacle 2 for receiving cut grass, can be secured to the handlebar 1 of the mower during the pivoting of the latter, and a trigger control means 2X of the rotation of the cutting blade.

[0013]

The means 28 for controlling the initiation or the driving in rotation of the cutting blade is advantageously in the form of a 29 remote control cable acting on a motor brake, a clutch brake or an electric contactor Food and actuated by means of an action to control member 30 maintained, such as a handle, lever, arch or the like, provided on the handlebar 1, this cable being provided with a driving part 31 cooperating with a hook 32 mounted on the handlebar 1 pivotably against the action of a return spring (not shown) and providing a releasable attachment of the safety cover 3 by engagement with a pivot or lug 33 provided on the corresponding face of said lid 3.

[0014]

Thus, when the control is not actuated, i.e., for example, when the user is about to empty the receptacle 2 for receiving cut grass, the cable 29 is released and the blade drive is interrupted, either by switching off the engine, or by interruption of the drive to the axis of the blade action on a brake and / or clutch. Simultaneously, the hook 32 pivots 32a in its position shown in Figure 2, under the action of the return spring, in which position said hook cooperates with the lug 33 of the corresponding face of the lid 3 (Figures 2 and 3). As a result, the lid 3 is connected to the handlebar 1 and, after unlocking of the latter, be pushed upward so as to allow disengagement of

said receptacle 2 for receiving cut grass.

[0015]

As part of this tilting, the distance between the cable sheaths of stops 29 varies in length  $x$  for a length  $x$  smaller than the first corresponding to a supplementary slack of the cable 29 to ensure rotation club impossibility of the cutting blade in the tilted position before the handlebar 1.

[0016]

Upon actuation of the control means 28, 29 the cable is tensioned by means of the operated control member 30 maintained, which has the effect of moving the drive member 31 against the hook 32 mounted on the handlebar 1 and cause it to pivot into a position 32b against the action of the return spring and thereby to separate the latter from the safety cover 3 by release of the pivot or pin 33 provided on the corresponding face of said lid 3. It follows that the lid 3 is automatically released to be positioned on the receptacle 2 for receiving cut grass, when said receptacle is in place, or to the exhaust pipe, in the absence of such a receptacle, so that a protection against the projections is always ensured.

[0017]

If the handlebar 1 should be rotated inadvertently forward during operation of the blade, without loosening of the operated control member 30 maintained, the safety cover 3 does not follow the movement of said handlebar 1 and remain in protective position above the receptacle 2 or to the exhaust pipe. In addition, due to the reduction of the distance between the cable sheath stops 29 during this pivoting, there would be a loosening of the latter which results in sufficient slack to ensure automatic interruption of the drive of the blade engine shutdown or interruption of drive of its axis, by acting on a brake and / or clutch.

[0018]

Moreover, the very presence of the hook hinders any attempt to open the safety cover 3 when the handle 1 is in the working position, thus limiting the risk of projections to the user.

[0019]

Figure 5 of the accompanying drawings shows another embodiment of the invention, wherein the safety device preventing against access to the rotating cutting blade is constituted by a 3-hinged safety cover on the mower, baffle at a mowing without grass collection and / or providing the upper closure of the receptacle 2 for receiving cut grass, can be secured to the handlebar 1 of the mower, in particular when the latter is pivoted, and by a means 4 for automatically triggering the cutting blade.

[0020]

When the handle 1 is pivoted, the safety cover 3 can be driven in a pivoting position upwardly simultaneously to pivot forwardly of the handlebar 1 (Figure 5), thus freeing access to the rear part of the mower to stall or the attachment of the receptacle 2 for receiving the cut grass.

[0021]

The safety cover 3 is advantageously pivotally mounted on a pivot shaft 5 of the handle 1 on the casing 6 of the mower and is connected to said handlebar 1 by means of a removable link 7 articulated on the one hand on the handlebar 1 and, secondly, on the lid 3. Preferably, the link 7 is a flexible link and is removably connected to the handlebar 1 by means of a screw fastening or an elastically deformable push-in fastener. By elastically deformable interlocking is specifically refers to a mounting clip type.

[0022]

In accordance with an alternative embodiment of the invention, shown in Figure 10 of the accompanying drawings, the small link 7 is in the form of an element with several fasteners 7' at different spacings can be connected to the handlebar 1 and the lid 3. Thus, depending on the link length of 7 required according to the lid should rest on the container 2 or directly on the housing 6 for sealing the exhaust pipe, an end connection 7' and an intermediate attachment 7' or end attachments 7 are connected respectively to the handlebar 1 and the cover 3, in order to always

allow a closure by the cover.

[0023]

According to the invention variant embodiment, not shown in the accompanying drawings, the lid 3 can also be operated indirectly by the handlebar 1. latter regard, pivot position towards the front, an electrical switch supplying an electromagnet or electric actuator tilting actuating upwards the cover 3. Such a cylinder assembly or solenoid and power contactor is of easy realization for the skilled person and requires no further detailed description.

[0024]

It is also possible, according to another alternative embodiment of the invention, not shown in the accompanying drawings to actuate the lid 3 indirectly by the handlebar 1 by means of a hydraulic or pneumatic control circuit implementing a first cylinder trigger request of the handlebar knob 1 in its pivoting forward position and causing the displacement of the piston of a second actuator acting on the cover 3 in the direction of tilting upwards. Such an embodiment is also perfectly accessible to the skilled person and do not require further development.

[0025]

As shown more particularly in Figures 7 and 8 of the accompanying drawings, the handle 1 is mounted pivotally on the pivot shaft 5 via angled nozzles 8 cooperating with the ends of said shaft 5 by bearings 9 provided at the elbow of said tips 8, the free end of the latter being provided with a stud 10 intended to cooperate with a means 11 for locking the handlebar 1 in position.

[0026]

This means 11 is advantageously constituted by at least one pivotal latch 12 articulated on a pin 13 of a 14 plate fixed on the corresponding side of the casing 6 of the mower, the pivoting latch 12 is loaded by a return spring 15 and being provided an appendage 16 of the retaining lug 10 of the nozzle 8 corresponding to the handlebar 1 in the operating position and at least one leg 17 of trigger latch 12, relying on a wing 18 of said bolt 12 opposite in appendix 16 with respect to the

axis 13 and integral with the shaft 5 of articulation of the handlebar 1.

[0027]

Thus, pressure on the tab 17, for example by means of the foot, will have the effect of inducing a pressure on the flange 18 of the latch 12 tending to tilt it about the axis 13 against the action of return spring 14. It follows that the corresponding lug 10 of the nozzle 8 is released by the appendix 16 so that the handle 1 can be swung in its pivot forward position shown in Figures 5 to 9. In the embodiment according to the accompanying drawings, the locking means 11 includes a latch 12 and the corresponding elements to each connector 8 of the handlebar 1. This has the advantage of allowing an operating indifferently to each side of the mower. However, implementation providing only the equipment of a cap could be considered.

[0028]

Due to the link by the link 7 between the handlebar 1 and the cover 3, pivoting the handlebar 1, after unlocking by the means 11 towards the front of the mower in a position corresponding to that shown in Figure 7, will effectively raise said cover 3 in a position allowing easy access to the handle 19 for handling the receptacle 2 for receiving cut grass, to stall this receptacle. Of course, the hooking is facilitated in an analogous manner, the entire rear part of the lawnmower is kept free.

[0029]

The means 4 for automatic triggering of the cutting blade consists essentially, according to a first embodiment of the invention shown schematically in Figures 9 and 10 of the accompanying drawings, by a trigger actuator 20, arranged in the rear face of the housing 6 mower bearing face for forming the receptacle 2 for receiving cut grass, and an appendix 21, mounted projecting on the inner face of the cover 3 and interacting indirectly or directly with the actuator 20 in position folding said lid 3 on the receptacle 2 or the rear face of the casing 6 of the mower. Such a trigger actuator 20 is therefore urged in a upward pivoting of the cover 3 alone or together with a forward pivoting of the handlebar 1.

[0030]

The trip actuator 20 may be an electrical switch of the power loss of an electric motor or ignition system of a combustion engine. In the case of mowers with a detachable blade, the trigger actuator 20 may take the form of a mechanical device acting on the clutch of the drive of the blade and interposed in the drive of the control of this clutch.

[0031]

According to one characteristic of the invention, the receptacle 2 for receiving cut grass is provided with a rocking lever 22 intermediate indirect actuation of the actuator 20 by the appendix 21 in the operating position of said container 2, this intermediate lever 22 then being supported on said actuator 20 by Appendix 21. In order to promote the triggering of the actuator 20 during a lifting of the lid 3, or manually through the handlebar 1, for releasing the receptacle 2 for receiving cut grass, the intermediate pivoting lever 22 is loaded by a return spring not shown in the figure 9, supported within said receptacle 2 for receiving cut grass or mounted as a spiral spring about the pivot axis of the lever 22.

[0032]

Thus, in the pivotal position forwardly of the handlebar 1, wherein the latter drives the cover 3 in a swinging upwardly, through the link 7, or in a manual lifting position of lid 3, the Appendix 21 is brought out of contact with the lever 22, which is pushed by the actuator 20, so that it is triggered automatically, which results in a corresponding triggering of the drive motor of the blade or clutch of the drive of the blade.

[0033]

In the case of the use of the mower without the receptacle 2 for receiving cut grass, the appendage 21 of the cover 3 acts directly on the actuator 20 in the operative position, the lid 3 resting on the rear face of casing 6 of the mower, and allows the realization of swaths without risk of injury by spraying for the user. In this configuration, the handlebar 1 is not connected to the cover 3 due to the reduced length of the link 7, the security is totally ensured during operation by positioning the lid 3, including an accidental or voluntary uprising effect immediate stop rotation of the blade in a manner identical to that described previously. However, to avoid accidental

triggering of the actuator 20, following a relatively small shock or vibration, the lid 3 is advantageously loaded by a return spring, not shown, ensuring minimal contact pressure of the appendix 21 of said actuator 20.

[0034]

Figure 10 of the accompanying drawings shows an alternative embodiment of the invention, wherein the means 4 for triggering the cutting blade is constituted by a trigger actuator 23, electric, electromechanical or mechanical cooperating with a cam 24 provided on the handlebar 1 or on the ends 8 of mounting of the latter. In this embodiment, the actuator 23 is applied when the handlebar 1 is tilted forward, with or without pivoting drive up the cover 3. Thus, tilting the handlebar 1 forward will consequently act on the actuator 23 through the cam 24 and thus to trigger stopping of the engine and / or clutch and brake of the blade cutting.

[0035]

It is also possible to realize the means 4 for triggering the cutting blade in the form of a trigger actuator 25, electric, electromechanical or mechanical, on which a pivotable transmission lever 26 provided with an appendix 27 intended to cooperate with the lower part of the lug 17 of the means 11 for locking and unlocking of the handlebar (Figure 11). Thus unlocking the handle 1 to its tipping forward, with or without corresponding pivot up the cover 3, is made possible in a simple way, with immediate effect a quick release of the actuator 25.

[0036]

In known manner, the lever 26 is preferably loaded at its end opposite that of pivoting, by a restoring spring facilitating the automatic return to the operating position of the trip actuator 25. In this embodiment, the unlocking of the handlebar 1, to its tilting forward, will automatically result in stopping the engine for driving the cutting blade and / or disengage and / or stop this last.

[0037]

The trigger actuators 23 and 25 are advantageously comparable to the trigger actuator 20 and are preferably of all or nothing, that is to say, not allowing a restart of the controlled element after their recloser by return to their operating position of control member.

[0038]

According to another variant embodiment of the invention, not shown in the accompanying drawings, the safety device preventing against access to the rotating cutting blade may be constituted by a safety cover 3 hinged to the mower baffle during mowing without grass collection and / or providing the upper closure of the receptacle 2 for receiving cut grass, can be secured to the handlebar 1 of the mower, in particular when the latter is pivoted, and by means of locking of the safety cover and / or the handlebar, in the service position, that is to say, the cutting blade being actuated. Such a locking means may advantageously be formed as an electric, mechanical or electromechanical, integrated to the handlebars or to the blade rotation control means, the traction drive of the mower or rotational speed of the engine and actuating an electromagnetic or mechanical lock mounted on the mower housing and cooperating with a corresponding housing provided on at least one handlebar tip or in a release tab of the lock of the latter or with a corresponding face of said bolt or the nozzle and / or with a housing provided in the lid or with a face of said lid.

[0039]

Electrical control, electromechanical or mechanical, integrated to the handlebars or to the blade rotation control means, the traction drive of the mower or rotation speed of the motor is in the form of a spring-trigger lever, lockable by manual pressure or by a snap device and cooperating with an electric contact for controlling an electromagnetic lock or with a cable or an actuating linkage of a mechanical lock.

[0040]

This electromagnetic or mechanical lock, mounted on the housing 1 of the mower acts on at least one end of the handlebar or a tip thereof or on the lock release leg of said handlebar and / or on



the lid, by cooperation shaped with corresponding housings or bearing against a corresponding face. Thus, it can be considered to enter the lock into a bore of a handlebar piece, preventing any pivoting of said handlebar, or in a bore of the release tab of said handlebar lock, preventing unlocking the immobilization handlebar said tab. Similarly, cooperation of the latch with the cover can be considered as a penetration of said latch in the lid material, holding the latter against pivoting about its axis on the casing.

[0041]

Finally, support the lock against one side of the locking elements can easily be done on the side towards which pivots these elements or their end or their corresponding face for actuating the automatic trigger means of the cutting blade. It follows that this pivoting is thus also prevented.

[0042]

Accordingly, the fact of mounting the drive in the handlebar or in the blade rotation control means, the traction drive of the mower or engine rotational speed, actuating a command or simply taking in the hands of the handlebar to achieve mowing result in a corresponding lock handle preventing access to the rotating cutting blade during operation of the mower.

[0043]

Thanks to the invention, it is possible to achieve a safety device preventing against access to the rotating cutting blade for lawn mowers pushed or propelled by type for performing the attachment and stall maneuvers receiving receptacle of the cut grass only when the blade is stopped and therefore safe for the user. Indeed, as appropriate, during these movements, the device will automatically turn the cutting blade out of action or prevent the operation as the cutting blade is maintained in rotation, so that any risk of accidental injury by spraying or by penetration of a member in the scope of said blade is avoided.

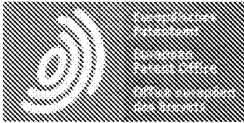
[0044]

In addition, simultaneously with the retirement of action of the cutting blade. Access to the rear of

the mower and the various operations are greatly facilitated.

[0045]

Of course, the invention is not limited to the described embodiments and shown in the accompanying drawings. Modifications are possible, especially from the viewpoint of the constitution of the various elements or by substitution of technical equivalents, without departing from the scope of the invention.



## Patent Translate

Powered by EPO and Google

### Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

### CLAIMS EP0903074

1.

Lawn mower, in particular pushed or self-propelled, provided with a handlebar (1), comprising a cutting device that ensure little pickup of the cut grass through an ejection duct into a receptacle (2) arranged to rear and comprising a safety device preventing against access to the rotating cutting blade, characterized in that the safety device comprises a safety cover (3) articulated to the mower, baffle at a mowing without grass collection and / or providing the upper closure of the receptacle (2) for receiving cut grass can be secured to the handlebar (1) of the mower during the pivoting of the latter, and by means ( 28) of the trigger control or driving in rotation of the cutting blade.

2.

A lawnmower according to claim 1, characterized in that the means (28) for controlling the stopping or the driving in rotation of the cutting blade is in the form of a cable (29) remote control acting on a motor brake, a clutch brake or an electric power switch and actuated by means of a hold-to-control member (30), such as a handle, lever, arch or similar provided on the handlebar (1), this cable being provided with a driving part (31) cooperating with a hook (32) mounted on the handlebar (1) pivotably against the action of a return spring and providing a releasable attachment of the safety cover (3) by engagement with a pivot or lug (33) provided on the corresponding face

of said lid (3).

3.

Lawn mower, in particular pushed or self-propelled, provided with a handlebar (1), comprising a cutting device that ensure little pickup of the cut grass through an ejection duct into a receptacle (2) arranged to rear and comprising a safety device preventing against access to the rotating cutting blade, characterized in that the safety device comprises a safety cover (3) articulated to the mower, baffle at a mowing without grass collection and / or providing the upper closure of the receptacle (2) for receiving cut grass can be secured to the handlebar (1) of the lawnmower, especially when the latter is pivotable, and by means (4) for automatically triggering the cutting blade.

4.

A lawnmower according to claim 3, characterized in that the safety cover (3) is pivotally mounted on a shaft (5) of articulation of the handle (1) on the casing (6) of the mower and is connected to said handlebar (1) via a removable link (7) articulated on the one hand on the handlebar (1) and, on the other hand on the lid (3).

5.

A lawnmower according to claim 4, characterized in that the link (7) is a flexible strap and is detachably connected to the handlebar (1) via a screw fixing or a push-in fastener elastically deformable.

6.

Lawnmower as claimed in claim 4, characterized in that the link (7) is in the form of an element with several clips (7') at different spacings can be connected to the handlebar (1) and the cover (3).

7.

A lawnmower according to claim 3, characterized in that the lid (3) is indirectly actuated by the handlebar (1), the latter acting, in the pivoting position to the front, an electrical switch supplying an electromagnet or actuator electrical tilt maneuver up the cover (3).

8.

A lawnmower according to claim 3, characterized in that the lid (3) is indirectly actuated by the handle (1) by means of a hydraulic or pneumatic control circuit implementing a first trigger control actuator biased the handlebar (1) in its pivoting position forwardly and causing the displacement of a second cylinder piston acting on the lid (3) in the direction of tilting upwards.

9.

A lawnmower according to any one of claims 3 and 4, characterized in that the handlebar (1) is mounted pivotally on the pivot shaft (5) via angled nozzles (8 ) cooperating with the ends of said shaft (5) via bearings (9) provided at the elbow of said tips (8), the free end thereof being provided with a lug (10) intended to cooperate with means ( 11) handlebar lock (1) in position.

10.

A lawnmower according to any one of claims 4 and 9, characterized in that the means (11) for locking the handlebar (1) in the operating position is formed by at least one pivotal latch (12) articulated on an axis (13) a plate (14) fixed to the corresponding side of the housing (6) of the mower, the pivoting latch (12) being loaded by a restoring spring (15) and being provided with an appendix (16) retaining the lug (10) of the endpiece (8) matching the handlebar (1) in the operating position and at least one tab (17) to lock the trigger (12), based on a wing ( 18) of said latch (12), opposite to the projection (16) relative to the axis (13), and secured to the shaft (5) of articulation of the handle (1).

11.

A lawnmower according to any one of claims 3 and 4, characterized in that the means (4) for automatically triggering the cutting blade is essentially constituted by a trigger actuator (20) arranged in the rear face of the casing (6) of the mower bearing face for forming the receptacle (2) for receiving cut grass, and by an appendage (21) mounted projecting from the internal face of the cover (3) and interacting indirectly or directly with the actuator (20) in crimping position of said lid (3) on the receptacle (2) or on the rear face of the casing (6) of the mower.

12.

Lawn mower according to claim 11, characterized in that the firing actuator (20) is an electric switch power loss of an electric motor or ignition system of a combustion engine.

13.

Lawnmower as claimed in claim 11, characterized in that the release actuator (20) is in the form of a mechanical device acting on the clutch of the drive of the blade and interposed in the drive of the control of this clutch.

14.

A lawnmower according to any one of claims 3 and 11, characterized in that the receptacle (2) cut grass receiving is provided with an intermediate rocking lever (22) of indirect actuation of the actuator (20) the appendage (21) in said receptacle operating position (2) this intermediate lever (22) then being supported on said actuator (20) by the projection (21).

15.

A lawnmower according to claim 14, characterized in that the intermediate pivot lever (22) is loaded by a return spring supported within the receptacle (2) receiving grass cut or mounted as of spiral spring on the lever pivot axis (22).

16.

Lawn mower, according to any one of claims 3, 4, 6 to 8 and 11, characterized in that the lid (3) is loaded by a return spring ensuring a minimum application pressure of the appendix (21) on the actuator (20).

17.

A lawnmower according to any one of claims 3 and 4, characterized in that the means (4) for triggering the cutting blade in a pivoted-up position of the lid (3) and / or the handlebar (1) toward the front is constituted by a firing actuator (23), electric, electromechanical or mechanical cooperating with a cam (24) provided on the handlebar (1) or on the end pieces (8) for mounting of the latter.

18.

A lawnmower according to any one of claims 3 and 10, characterized in that the means (4) of the cutting blade trigger is constituted by a trigger actuator (25), electric, electromechanical or mechanical, on which a pivotable transmission lever (26) provided with an appendix (27) intended to cooperate with the lower part of the tab (17) of the means (11) for locking and unlocking of the handlebar.

19.

A lawnmower according to any one of claims 11, 17 and 18, characterized in that the triggering of actuators (20, 23 and 25) are all or nothing type, that is to say not allowing delivery switching on the driven member after their recloser by return to the operating position of their control member.

20.

A lawnmower according to claim 1, characterized in that the safety device comprises a safety cover (3) articulated to the mower, baffle during mowing without grass collection and / or ensuring

the upper closure of the receptacle (2) for receiving cut grass, for fixing to the handlebar (1) of the lawnmower, especially when the latter is pivoted, and by a safety cover locking means and / or the handlebar, in the service position, that is to say, the blade section being pressed.

21.

A lawnmower according to claim 20, characterized in that the locking means is formed as an electric control, electromechanical or mechanical, fitted to the handlebars or to the blade rotation control means, the drive of the mower in traction or engine rotational speed and actuating an electromagnetic or mechanical lock mounted on the mower housing and cooperating with a corresponding housing provided on at least one handlebar tip or in a release tab of the lock of the latter or with a corresponding face of said bolt or the nozzle and / or with a housing provided in the lid or with a face of said lid.

22.

A lawnmower according to claim 21, characterized in that the electric control, electromechanical or mechanical, fitted to the handlebars or to the blade rotation control means, the traction drive of the mower or engine rotational speed is in the form of a spring-trigger lever, lockable by hand pressure or by a snap device, and cooperating with an electric contact for controlling an electromagnetic lock or with a cable or an actuating linkage of a mechanical lock.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

**Secrecy Order 37 CFR 5.2**

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

**Inventor Information:**

<b>Inventor 1</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Toshinari		Yamaoka		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>		16-704 Renheng Bamboo Garden, No. 5 Yulan Road			
<b>Address 2</b>		Yuhua District			
<b>City</b>	Nanjing	<b>State/Province</b>			
<b>Postal Code</b>			<b>Country <sup>i</sup></b>	CN	
<b>Inventor 2</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Fangjie		Nie		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>		Room 402 Biboge, Culture Country, No. 88 Tianyuan Rd			
<b>Address 2</b>		Jiangning District			
<b>City</b>	Nanjing	<b>State/Province</b>			
<b>Postal Code</b>			<b>Country <sup>i</sup></b>	CN	
<b>Inventor 3</b>					<a href="#">Remove</a>
<b>Legal Name</b>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		

<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>
	Haishen		Xu	
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
<b>City</b>	Nanjing	<b>Country of Residence <sup>i</sup></b>	CN	
<b>Mailing Address of Inventor:</b>				
<b>Address 1</b>	Room 302, No. 32, Rehe South Road			
<b>Address 2</b>	Xiaguan District			
<b>City</b>	Nanjing	<b>State/Province</b>		
<b>Postal Code</b>		<b>Country <sup>i</sup></b>	CN	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button. <div style="text-align: right;"><b>Add</b></div>				

**Correspondence Information:**

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.	
<b>Customer Number</b>	34018
<b>Email Address</b>	chiipmail@gtlaw.com
<div><b>Add Email</b></div> <div><b>Remove Email</b></div>	

**Application Information:**

<b>Title of the Invention</b>	GARDENING TOOL		
<b>Attorney Docket Number</b>	78873.176US2	<b>Small Entity Status Claimed</b>	<input type="checkbox"/>
<b>Application Type</b>	Nonprovisional		
<b>Subject Matter</b>	Utility		
<b>Total Number of Drawing Sheets (if any)</b>	6	<b>Suggested Figure for Publication (if any)</b>	

**Publication Information:**

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

**Representative Information:**

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	34018		

### Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending	<a href="#">Remove</a>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	14511490	2014-10-10

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

### Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)<sup>i</sup> the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

<a href="#">Remove</a>			
Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>i</sup> (if applicable)
201310468919.9	CN	2013-10-10	
<a href="#">Remove</a>			
Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>i</sup> (if applicable)
201410167041.X	CN	2014-04-23	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p><input type="checkbox"/> NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p>
--

## Authorization to Permit Access:

<p><input type="checkbox"/> Authorization to Permit Access to the Instant Application by the Participating Offices</p>
<p>If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.</p> <p>In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.</p> <p>In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.</p>

## Applicant Information:

<p>Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.</p>
--

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		

<b>Applicant 1</b>			
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;"><input type="button" value="Clear"/></p>			
<input checked="" type="radio"/> Assignee		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
<input type="radio"/> Person to whom the inventor is obligated to assign.		<input type="radio"/> Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>			
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	CHERVON INTELLECTUAL PROPERTY LIMITED		
<b>Mailing Address Information For Applicant:</b>			
Address 1	P.O. Box 957		
Address 2	Offshore Incorporations Centre		
City	Road Town	State/Province	
Country	VG	Postal Code	
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

## Assignee Information including Non-Applicant Assignee Information:

<p>Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.</p>	
<b>Assignee 1</b>	
<p>Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.</p>	
<p>If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/></p>	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	78873.176US2
		Application Number	
Title of Invention	GARDENING TOOL		

Prefix	Given Name	Middle Name	Family Name	Suffix

**Mailing Address Information For Assignee including Non-Applicant Assignee:**

Address 1			
Address 2			
City		State/Province	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

**Signature:**

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/Keith R. Jarosik/		Date (YYYY-MM-DD)	2016-08-29
First Name	Keith R.	Last Name	Jarosik	Registration Number
35906				

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**STATEMENT UNDER 37 CFR 3.73(c)**

Applicant/Patent Owner: Chervon Intellectual Property Limited  
Application No./Patent No.: filed herewith Filed/Issue Date: filed herewith  
Titled: GARDENING TOOL  
Chervon Intellectual Property Limited, a corporation  
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is \_\_\_\_%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

2. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*



**STATEMENT UNDER 37 CFR 3.73(c)**

3. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

4. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

5. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

6. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Keith R. Jarosik/

Signature

Keith R. Jarosik

Printed or Typed Name

August 29, 2016

Date

47,683

Title or Registration Number

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		GARDENING TOOL		
First Named Inventor/Applicant Name:		Toshinari Yamaoka		
Filer:		Keith Richard Jarosik/Cynthia Tapia		
Attorney Docket Number:		078873.176US2		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>1600</b>

Electronic Acknowledgement Receipt	
<b>EFS ID:</b>	26778102
<b>Application Number:</b>	15250408
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8522
<b>Title of Invention:</b>	GARDENING TOOL
<b>First Named Inventor/Applicant Name:</b>	Toshinari Yamaoka
<b>Customer Number:</b>	34018
<b>Filer:</b>	Keith Richard Jarosik/Cynthia Tapia
<b>Filer Authorized By:</b>	Keith Richard Jarosik
<b>Attorney Docket Number:</b>	078873.176US2
<b>Receipt Date:</b>	29-AUG-2016
<b>Filing Date:</b>	
<b>Time Stamp:</b>	17:27:55
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$1600
RAM confirmation Number	083016INTEFSW00004413502428
Deposit Account	502428
Authorized User	Cynthia Tapia
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

37 CFR 1.21 (Miscellaneous fees and charges)

**File Listing:**

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	078873_176US2Trans.pdf	233497	no	2
			600e51d43647c2959d8e78c2725ffb6cadfcef6f		
Warnings:					
Information:					
2		078873_176US2Appl.pdf	183782	yes	21
			9d50cc832dd09b75a1a12192a5c9296b0877056c		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	13	
	Claims		14	20	
	Abstract		21	21	
Warnings:					
Information:					
3	Power of Attorney	078873_176US2POA.pdf	180866	no	2
			1d763d8cbc90245e6a15c37fb5ae72bd0734698e		
Warnings:					
Information:					
4	Drawings-only black and white line drawings	078873_176US2Drawings.pdf	373360	no	6
			068ce7db8740b0bc9ca9ed7f0b374118eb0f16f6		
Warnings:					
Information:					
5	Oath or Declaration filed	078873_176US2Decl.pdf	328312	no	4
			7e4478ff145fb5659e8db1d9cb9279851e34d8c2		

Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	078873_176US2IDS.pdf	164128	no	5
			4938c3eb25e9b36418de77f485f187766319de55		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
7	Foreign Reference	078873_176US2EP0903074A1.pdf	2249764	no	21
			60c447131d46e307c6e8ea588dc603686536ecb1		
Warnings:					
Information:					
8	Application Data Sheet	078873_176US2ADS.pdf	104010	no	7
			148b5361f752c0fd533d048e3dbe8d43a4491a04		
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
9	Assignee showing of ownership per 37 CFR 3.73	078873_176US2Statement.pdf	82266	no	3
			f22915bdded471400952e36c0fd8d1d63c9e0f71		
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	34718	no	2
			fa2876a866b52fb397a8ab253ff5cf153bcc5b92		
Warnings:					
Information:					
Total Files Size (in bytes):			3934703		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.