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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2022/0125034 A1****Han et al.**(43) **Pub. Date: Apr. 28, 2022**(54) **WEED REMOVING TOOL**

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(57)

ABSTRACT(22) Filed: **Jan. 5, 2022****Related U.S. Application Data**

(62) Division of application No. 15/222,952, filed on Jul. 29, 2016, now abandoned.

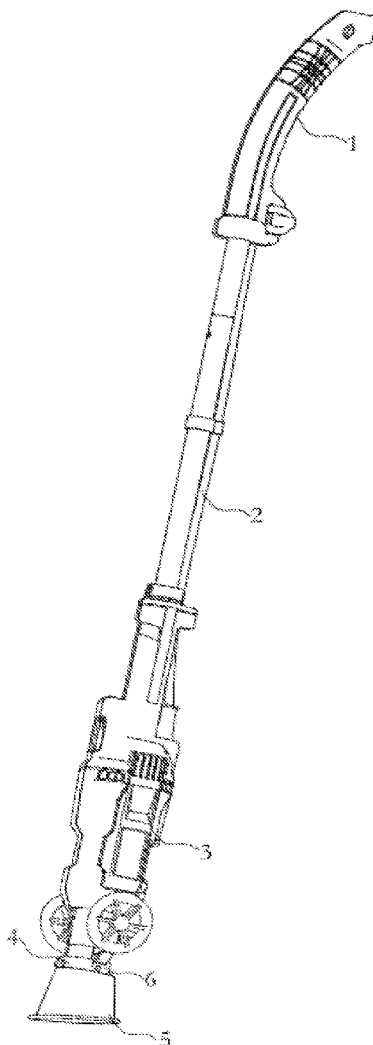
Foreign Application Priority Data

(30)

Apr. 8, 2016 (CN) 201620289531.1

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A weed removing tool includes a tool body and a cover body arranged on an air outlet on the tool body. The cover body is provided with a support frame forming a heat dissipation gap between an opening and an object to be processed during operation. Such a structure prevents the problem that the entire heating object is over-heated to damages because the cover body is coated over the heating object and is not timely removed. In addition, with such a structure, during heating, the force applied by the hands may be reduced by means of the support frame.



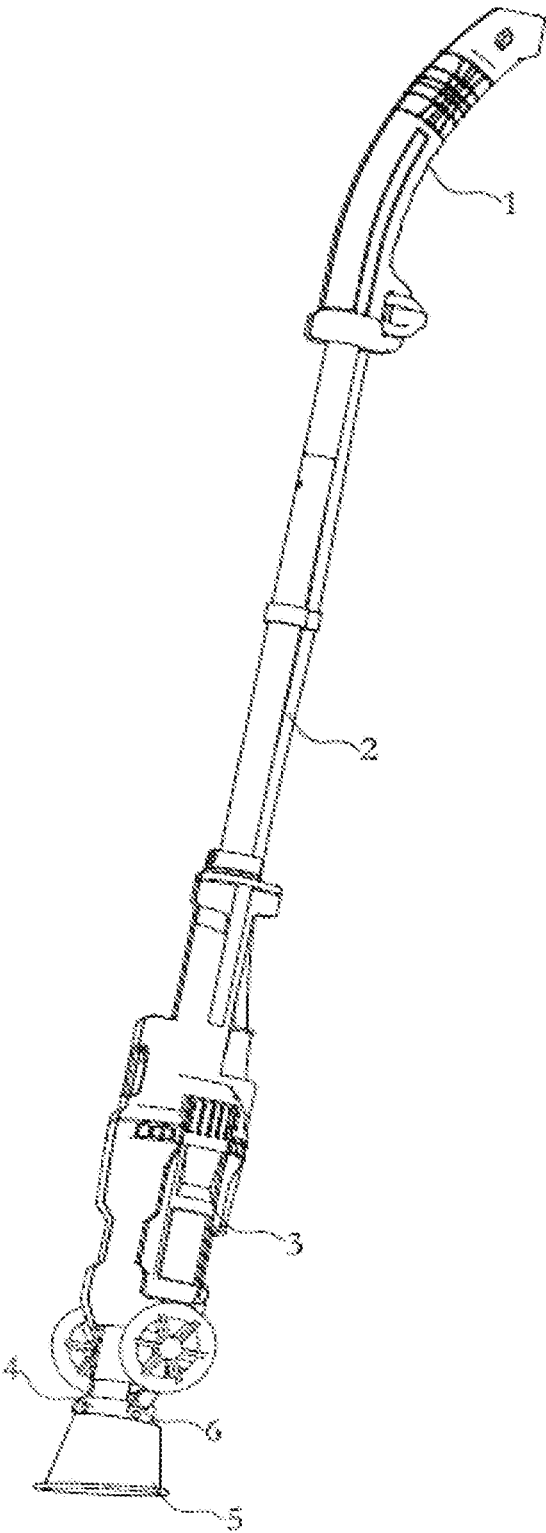


FIG. 1

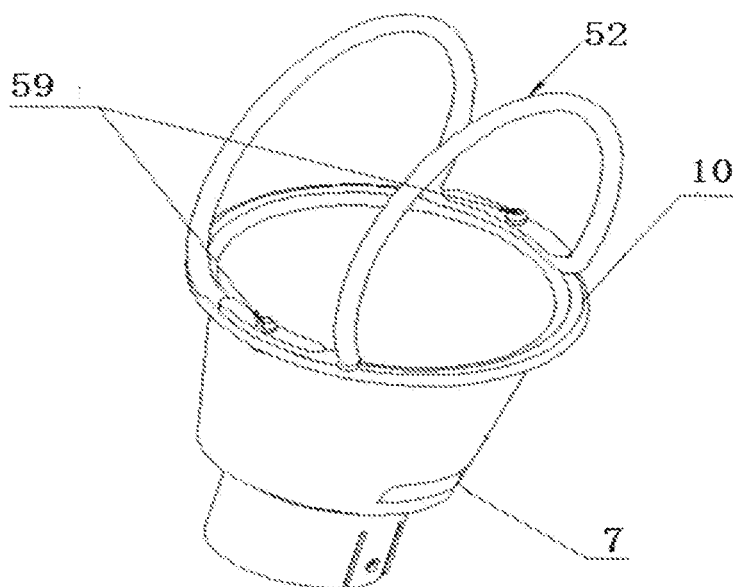


FIG. 2

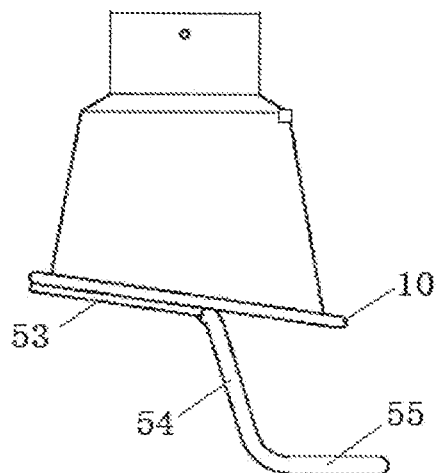


FIG. 3

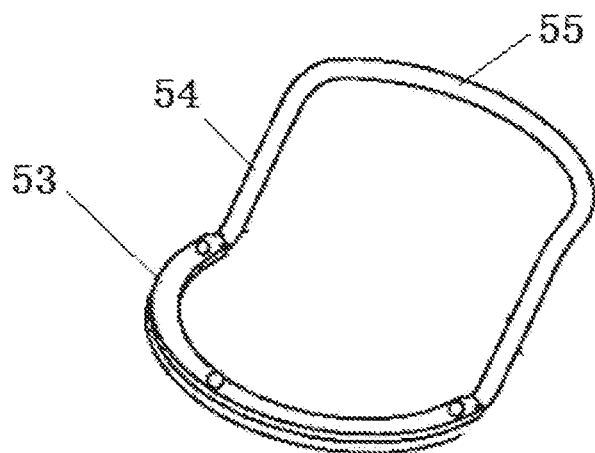


FIG. 4

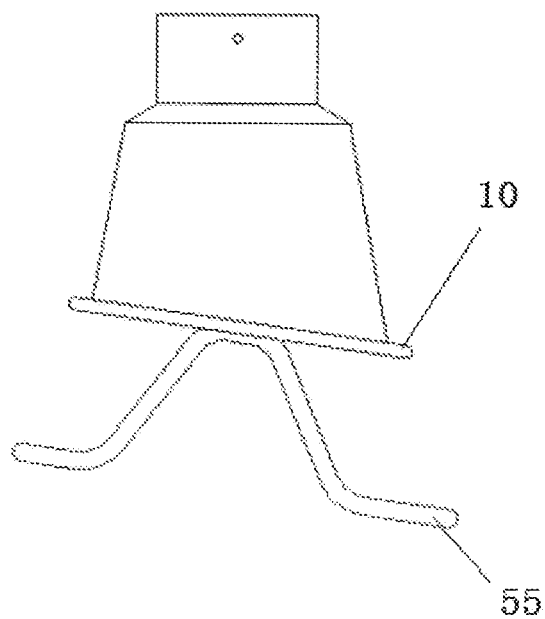


FIG. 5

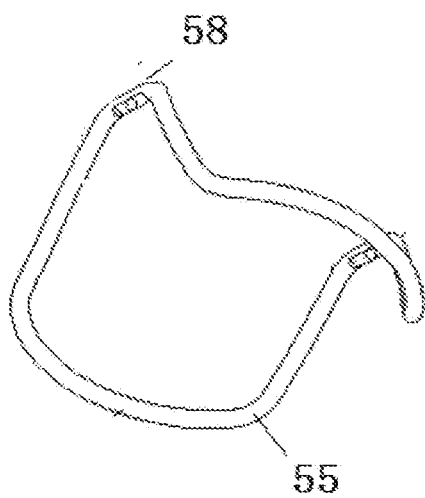


FIG. 6

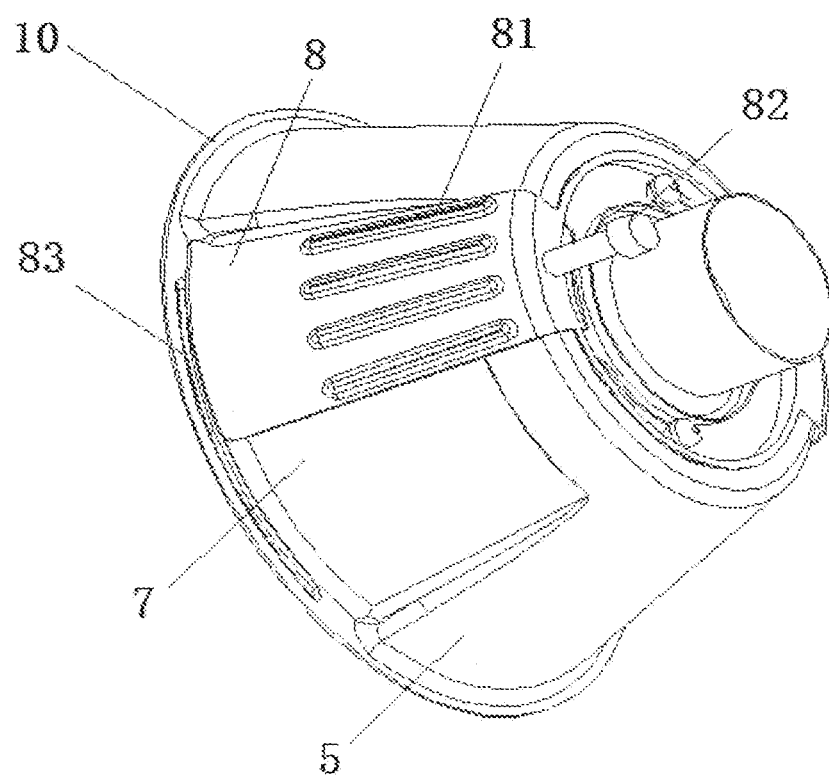


FIG. 7

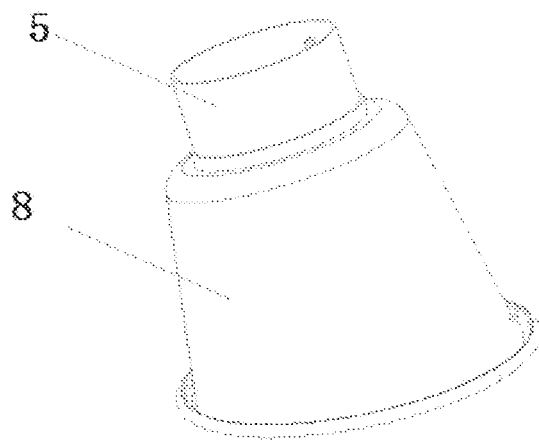


FIG. 8

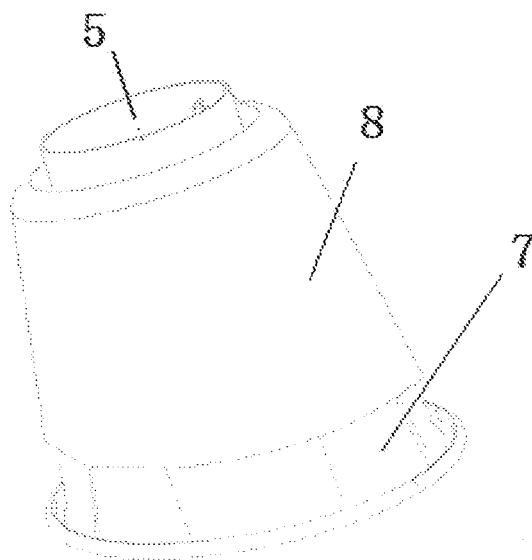


FIG. 9

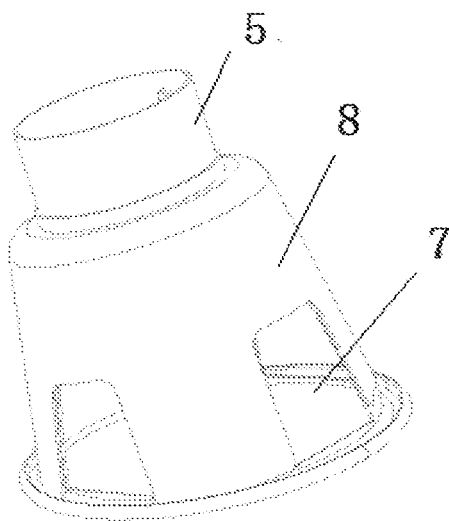


FIG. 10

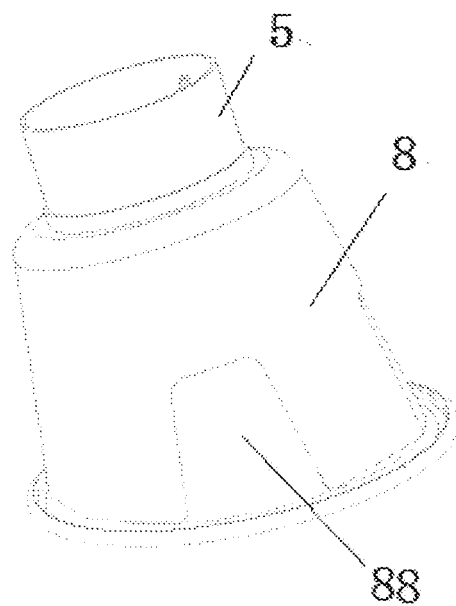


FIG. 11

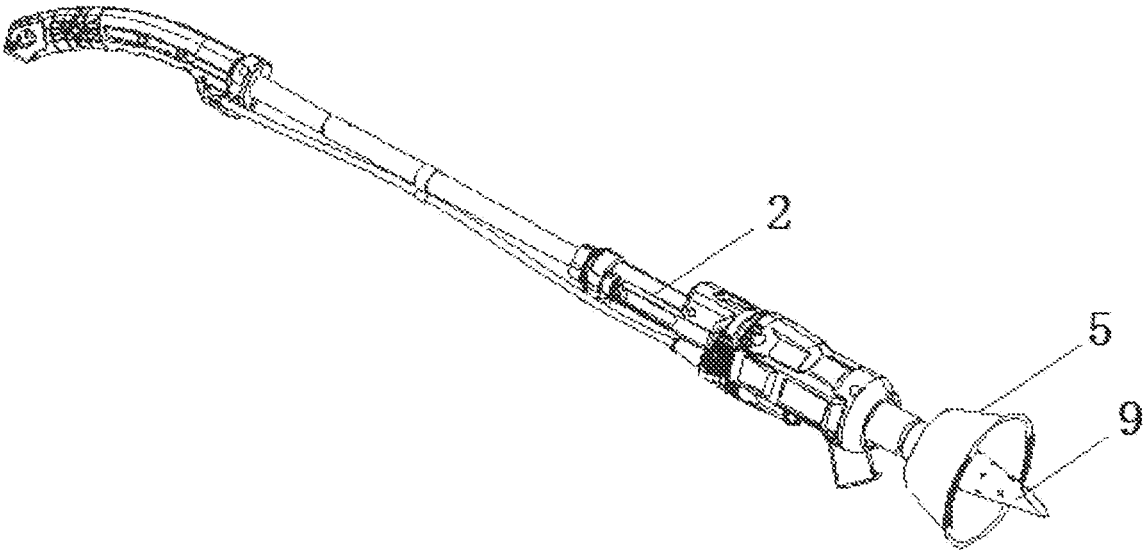


FIG. 12

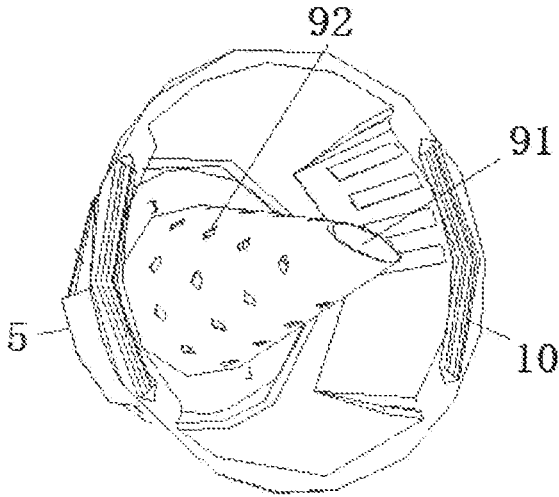


FIG. 13

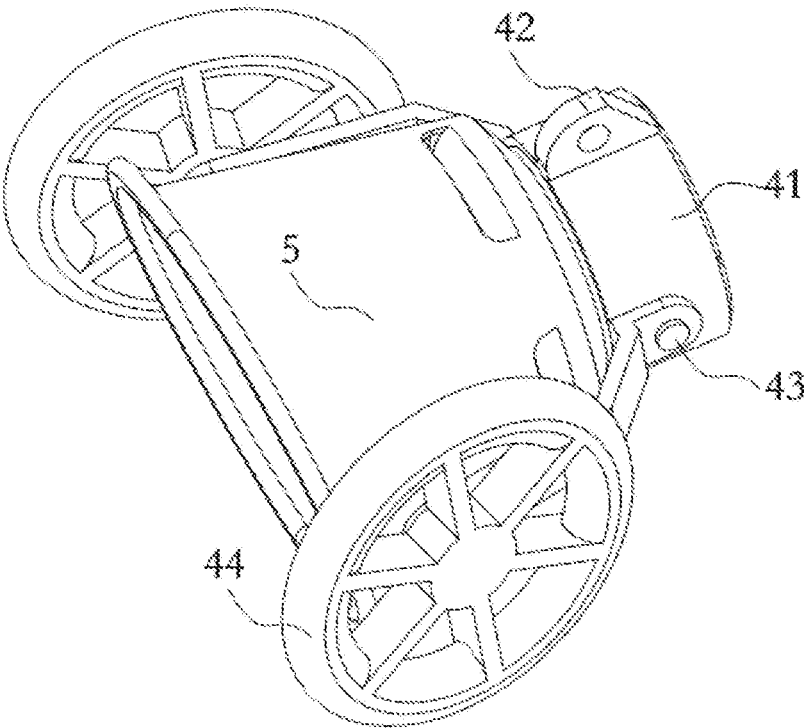


FIG. 14

WEED REMOVING TOOL

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional application of and claims the priority benefit of U.S. application Ser. No. 15/222,952, filed on Jul. 29, 2016, which claims the priority benefit of China application serial no. 201620289531.1, filed on Apr. 8, 2016 and China application serial no. 201620366627.3, filed on Apr. 27, 2016 and China application serial no. 201620366908.9, filed on Apr. 27, 2016 and China application serial no. 201610307985.1, filed on May 10, 2016 and China application serial no. 201620420734.X, filed on May 10, 2016. The entirety of each of the above-mentioned patent applications is hereby incorporated by reference herein and made a part of this specification.

TECHNICAL FIELD

[0002] The present invention relates to the field of electric tools, and in particular, relates to a weed removing tool.

BACKGROUND

[0003] The categories of weed removing tools are more and more refined. In the current market, a weed burner in a substantially elongated shape emerges. A common weed remover is only capable of removing stem and leaves of the weed, with the root of the weed still remaining in the soil. In this way, a period of time later, new stem and leaves may grow out from the root. However, the weed burner may spray hot wind which can kill the root of the weed, which prevents the growth of new stem or leaves from the root. Since this type of product is just released to the market, few development resources are provided to the product, such that the product is subjected to various problems during use.

[0004] In the related art, to solve this technical problem, the invention patent No. 201210228409.X entitled with "DEVICE, ASSEMBLY, AND METHOD FOR MANUALLY LOCALLY REMOVING WEED" is provided. A heat generator 4 attached to a rod 2 is disclosed. The heat generator 4 includes a fan and a heating resistor, the heat generator 4 injects a hot air jet flow J1 to an interior volume V5 of a clock-shaped member 5, wherein the clock-shaped member 5 is provided with a free end 51 operable to bear and support the device 1 on the ground. According to this invention patent, the clock-shaped member 5 is provided with at least one hole operable to exhaust an air jet flow J2 from the interior volume V5 of the clock-shaped member 5. A spacing between the hole and the free edge 51 is greater than 2 cm.

[0005] In the related art, the blower and the hot weed remover, although with different names, operate under the similar principle. However, the hole designed in the related art reduces the efficiency of the heating device to some extent. Particularly, the heating device fails to conduct heating based on precise positioning. In addition, turbulence may be caused during adjustment the air speed at the air outlet, thereby causing user inconvenience.

SUMMARY

[0006] To solve the above problem, the present invention provides a weed removing tool which may be more conveniently

used, to attain improvements in three aspects of weed removing efficiency, product use safety and product life time.

[0007] To achieve the above objective, in the present invention, a weed removing tool includes a tool body and a cover body arranged on an air outlet on the tool body. The cover body is provided with a support frame forming a heat dissipation gap between an opening and an object to be processed during operation. Such a structure firstly prevents the problem that the entire heating object is over-heated and burned because the cover body is coated over the heating object and is not timely removed. In addition, with such a structure, during heating, the force applied by the hands may be reduced by means of the support frame, the working load may be lowered, and the entire heating precision is higher. [0008] Preferably, the support frame includes a fixing portion connected to the cover body, and a support end acting on the object to be processed and forming the heat dissipation gap.

[0009] The present invention further provides a weed removing tool including a tool body and a cover body arranged on an air outlet, the cover body having a heat dissipation port. A cover sheet for regulating the size of the heat dissipation port to thus regulate the temperature at the air outlet is arranged at a position on the cover body corresponding to the heat dissipation port. With such a structure, during heating, the size of the heat dissipation port may be adjusted according to the actual needs, which does not waste the heat within the cover body, and additionally prevents safety risks caused by over-heating within the cover body. The entire structure may be more conveniently carried and mounted.

[0010] Preferably, the cover sheet is connected to the cover body, and is movable relative to the cover body. Through movement, the cover sheet may adjust the area covering the heat dissipation port, thereby controlling the heat dissipated from the heat dissipation port and achieving the effect of temperature adjustment.

[0011] Preferably, the cover sheet is an outer cover coating the cover body, the outer cover axially moving relative to the cover body and being fixed to a selected position. In this way, the size of the heat dissipation port may be adjusted by axially moving the cover sheet.

[0012] Preferably, the cover sheet is an outer cover coating an outer side of the cover body, the outer cover being provided with a limiting port 88 matching with the heat dissipation port, and the outer cover rotating relative to the cover body. The overlap portion between the limiting port 88 and the heat dissipation port is an actually opened portion of the heat dissipation port. With such a solution, the actually opened area of the dissipation port may be adjusted by rotating the outer cover, thereby adjusting the actual temperature within the cover body.

[0013] Preferably, the air outlet of the tool body is further provided with a root burning probe. With such a structure, the tool may be directly inserted into the soil to cut the root of the weed, thereby really achieving the effect of absolutely eliminating the weed. In this way, the weed may be effectively, environmentally and quickly removed. In addition, during the weed removing, the soil may also be loosened, and the pests underneath the soil may also be killed, thereby improving the quality of the soil.

[0014] Preferably, the root burning probe is a hollow conical structure, and a top portion of the probe is provided

with an air outlet hole. Such a structure ensures that the burning and removing work is conducted in a short range after the tool is inserted into the soil.

[0015] Preferably, heat dissipation holes are arranged on a side wall of the root burning probe. The heat dissipation port provided on the side wall of the root burning probe prevents overheat of the intermediate portion of the root burning probe. During use, the heat dissipation port on the side wall of the root burning probe outside the soil prevents the root burning probe from being burnt due to over-heat.

[0016] Preferably, an edge of the air outlet hole at the top portion the root burning probe is a blade portion. In this way, the weed may be firstly cut and then burnt, thereby achieving a very thorough removing effect.

[0017] Preferably, the root burning probe is a solid metal cone. In some scenarios where the soil is very solid and hard, the hollow root burning probe is hard to be inserted, and thus the probe is subjected to great wear. In this case, a solid metal cone may be conveniently inserted into the root of the weed. However, such a structure requires that the probe is inserted to be very close to the root of the weed, in order to achieve an anticipated burning and removing effect.

[0018] Preferably, the weed removing tool further includes at least one wheel body arranged on a side face of the cover body and operable to support the weed removing tool. When the weed removing region needs to be shifted, a user may directly conveniently move the tool to a next location by means of pushing. This prevents the spray cover from being affected by the objects on the ground. During normal use, the weed removing tool has its own weight and may be subjected to jitter. However, in this solution, the wheels of the tool withstands from the pressure and jitter, thereby prolonging the life time of the spray cover, and enhancing the overall stability of the entire tool.

[0019] Preferably, the weed removing tool further includes a free edge, wherein a plane where the free edge of the cover body is located forms an inclined angle with a plane perpendicular to an air outlet direction of the air outlet. The free edge refers to an edge of an air outlet side of the opening on the cover body. With such an angle, the tool may not be necessarily perpendicular to the ground when a hot wind gun is used. This facilitates the use and operations of the tool.

[0020] Preferably, the tool body and the cover body are integrally formed.

[0021] With the technical solution of the present invention, the tool is designed with respect to different weed burning and removing scenarios very dedicatedly, and the weed burning and removing work may be more professionally, more safely and more effectively conducted.

[0022] These advantages and characteristics of the present invention are described hereinafter in detail in the detailed description, and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

[0023] The present invention is further described with reference to the accompanying drawings.

[0024] FIG. 1 is a schematic integral view of a weed removing tool equipped with a wheel body according to the present invention;

[0025] FIG. 2 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 1 of the present invention;

[0026] FIG. 3 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 2 of the present invention;

[0027] FIG. 4 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 2 of the present invention;

[0028] FIG. 5 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 3 of the present invention;

[0029] FIG. 6 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 3 of the present invention;

[0030] FIG. 7 is a schematic structural diagram of a cover body of a weed removing tool according to Embodiment 4 of the present invention;

[0031] FIG. 8 is a schematic structural diagram of a weed removing tool equipped with a root burning probe according to Embodiment 4 of the present invention;

[0032] FIG. 9 is a schematic structural view of a cover body according to Embodiment 5 of the present invention;

[0033] FIG. 10 is another schematic structural view of the cover body according to Embodiment 5 of the present invention;

[0034] FIG. 11 is a schematic structural diagram of a cover body equipped with a root burning probe according to Embodiment 6 of the present invention;

[0035] FIG. 12 is a schematic structural diagram of a weed removing tool equipped with a root burning probe according to Embodiment 7 of the present invention;

[0036] FIG. 13 is a schematic structural diagram of a cover body equipped with a root burning probe according to Embodiment 7 of the present invention; and

[0037] FIG. 14 is a schematic structural view of a cover body equipped with a wheel body according to the present invention.

DETAILED DESCRIPTION

[0038] The technical solution according to embodiments of the present invention is further illustrated and described with reference to the accompanying drawings of the embodiments of the present invention. However, the embodiments hereinafter are merely some preferred embodiments, rather than all embodiments of the present invention. Based on the embodiments of the present invention, all other embodiments derived by persons of ordinary skill in the art without any creative efforts shall fall within the protection scope of the present invention.

[0039] As illustrated in FIG. 1, a weed removing tool is provided, which includes a tool body, wherein the tool body is a tool body rod 2 having a handle 1 and a cover body 5 connected to the tool body rod 2. The other end of the tool body rod 2 is provided with a heating and air blowing apparatus 3. A front end of the heating and air blowing apparatus 3 is provided with an air outlet 6.

Embodiment 1

[0040] As illustrated in FIG. 2, a weed removing tool is provided, wherein at least two parallelly arranged arc-shaped metal support rings 52 are fixed on a free edge 10 of the cover body 5 by using a fixing member, wherein the metal support rings 52 do not obscure the air outlet 6 of the tool body. Such a structure ensures that the free edge 10 of the cover body 5 is maintained a specific distance from the

object to be processed, wherein this distance is generally preferably defined between 1 cm and 3 cm. During heating, the radian of the metal support rings 52 may also be utilized to precisely adjust the heating angle only with a mild force.

Embodiment 2

[0041] As illustrated in FIG. 3 and FIG. 4, a weed removing tool is provided, wherein the support frame includes a fixing portion 53, a transitional portion and a support portion. The fixing portion 53 has the same radian as the free edge of the cover body 5, and is fixed on the free edge 10. The support portion is distal from the free edge 10. The transitional portion is connected to the fixing portion 53 and the support portion 5, and ensures that the support portion 5 is still capable of maintaining a distance of at least 1 to 3 cm from the free edge 10 when withstanding a force. With such a structure, the support frame is securely fixed to the cover body 5, and thus the structure is capable of withstand a greater force.

Embodiment 3

[0042] As illustrated in FIG. 5 and FIG. 6, a weed removing tool is provided, wherein the side view of the support frame is an inverted V shape, wherein a highest point 58 of the inverted V shape is fixed to the free edge 10, and the bottom of the inverted V shape is an annular support portion 55. Such a structure is advantageously in that the structure is stable and thus labor saving for the operational personnel.

[0043] In various embodiments, the free edge 10 of the cover body 5 is a flat edge, and is designed such that an inclined angle of not greater than 30 is formed between the plane where the cover body is located and the plane perpendicular to an air outlet direction of the air outlet 6.

[0044] In this way, even if the support frame is burnt, the cover body 5 would not form an closed region with the heating object to cause over-heat.

[0045] If it is further desired to reduce the heat, a heat dissipation port 7 is further provided on the cover body 5.

[0046] In various embodiments, the support frame and the cover body 5 may be fixed to each other via a rivet 59 or by means of direct welding. In several embodiments of the present invention, since the support frame is mounted on the free edge 10 and the contact area thereof is small, a rivet-based connection is employed.

[0047] Although in the specific embodiments, implementation of mounting the support frame on an inner side or an outer side of the cover body 5 is not involved, it may be readily inferred from the embodiments that the support frame is mounted on the inner side or the outer side of the cover body 5. These technical solutions are all within the protection scope of the present invention. In addition, in such embodiments, the support frame is more suitable to be mounted on the cover body 5 by means of welding.

Embodiment 4

[0048] As illustrated in FIG. 7, a weed removing tool according to the present invention includes a cover body 5 having a heat dissipation port 7 for heat dissipation, wherein a cover sheet 8 for regulating the size of the heat dissipation port to thus regulate the temperature at an air outlet 6 is arranged at a position on the cover body 5 corresponding to the heat dissipation port 7. The cover sheet 5 is connected to the cover body 5, and is subject to displacement relative to

the cover body 5. The displacement includes rotation and translation of the cover sheet 8.

[0049] The cover sheet 8 is a trapezoid cover sheet 8 and the coverage area thereof is greater than the area of the heat dissipation port 7. The cover body 5 includes the free edge 10. The free edge 10 refers to an edge at the position of the air outlet port 6 of the cover body 5, which is in direct contact with the circle of the heating object. The free edge neighboring the heat dissipation port 7 is provided with a limiting groove 83 restricting a movement range of the cover sheet 8. A push rod 82 for controlling movement of the cover sheet 8 is further provided on an upper end of the cover sheet 8. In this way, the position of the cover sheet 8 may be adjusted by moving the push rod 82. To prevent the cover sheet 8 from being subjected to displacement after the adjustment, the cover sheet 8 is provided with at least one hollow protrusion strip 81. The hollow protrusion strip 81 meanwhile prevents the cover sheet 8 from deformation due to thermal expansion and contraction. Four to six hollow protrusion strips 81 are generally parallelly arranged, such that a better utilization effect is achieved.

[0050] In this way, the weed removing tool according to the present invention may be used after being mounted in a weed burner. During use, the heat within the cover body 5 may be controlled by adjusting the position of the cover sheet 84.

Embodiment 5

[0051] As illustrated in FIGS. 8 and 9, a weed removing tool according to the present invention includes a cover body 5 which is provided with a heat dissipation port 7 for heat dissipation, wherein a cover sheet 8 for regulating the size of the heat dissipation port 7 to thus regulate the temperature at an air outlet 6 is arranged at a position on the cover body 5 corresponding to the heat dissipation port 7. The cover sheet 8 is an outer cover coating the cover body 5. The outer cover axially moves relative to the cover body 5, and may be fixed to a selected position. A top portion of the outer cover is connected to the body of the weed burner, and is provided with a rapid fastener.

[0052] In this embodiment, the size of the heat dissipation port 7 is controlled by axially adjusting the position of the outer cover. After the adjustment, the heat dissipation port is fixed to the position by using a fast fastener.

Embodiment 6

[0053] As illustrated in FIG. 10 and FIG. 11, a weed removing tool according to the present invention includes a cover body 7 which is provided with a heat dissipation port 7 for heat dissipation, wherein a cover sheet 8 for regulating the size of the heat dissipation port 7 to thus regulate the temperature at an air outlet 6 is arranged at a position on the cover body 5 corresponding to the heat dissipation port 7. The cover sheet 8 is an outer cover coating the outer side of the cover body 5. The outer cover is provided with a limiting port 88 matching with the heat dissipation port 7, and rotates relative to the cover body 5. In this way, the overlap portion between the rotated limiting port 88 and the heat dissipation port 7 is the really opened heat dissipation port. In this way, the actual temperature within the cover body 5 is adjusted.

Embodiment 7

[0054] As illustrated in FIG. 12 and FIG. 13, a weed removing tool according to the present invention, a root

burning probe **9** is fixed to the position of an air outlet **6**, wherein the root burning probe **9** is a hollow conical structure. A top portion of the root burning probe **9** is provided with an air outlet hole **91**, and a side wall of the root burning probe **9** is provided with heat dissipation holes **92**. The air outlet hole **91** is arranged on a side face of the root burning probe **9**, and the air outlet hole **91** is tangential to the top portion of the root burning probe **9**. The edge of the air outlet hole **91** is a blade portion. In this way, after the root burning probe **9** is inserted into the soil, the weed removing tool may firstly cut the weed and then burning and remove the root of the weed by means of heating.

[0055] The cover body **5** includes a body having a heat dissipation groove, wherein a sliding barrier is mounted on the body. The cover body **5** is further provided with a limiting sliding groove, and the sliding barrier is mounted in the limiting sliding groove. A side face of the sliding barrier is further provided with parallel ribs, and the sliding barrier is further connected to an operation rod.

[0056] With respect to different cases, the root burning probe **9** and the tool body may be integrally formed, and the cover body **5** is mounted on the tool body via a detachable connection member. Similarly, the root burning probe **9** may also be formed integrally with the cover body **9**, and then mounted on the tool body.

Embodiment 8

[0057] In a weed removing tool according to the present invention, a root burning probe **9** is fixed at the position of an air outlet port **6**, wherein the root burning probe **9** is a solid metal cone. Such a structure is suitable for the scenario of solid and hard soil. The cover body **5** includes a body having a heat dissipation groove, wherein a sliding barrier is mounted on the body. The cover body **5** is further provided with a limiting sliding groove, and the sliding barrier is mounted in the limiting sliding groove. A side face of the sliding barrier is further provided with parallel ribs, and the sliding barrier is further connected to an operation rod.

[0058] With respect to different cases, the root burning probe **9** and the tool body may be integrally formed, and the cover body **5** is mounted on the tool body via a detachable connection member. Similarly, the root burning probe **9** may also be formed integrally with the cover body **9**, and then mounted on the tool body.

[0059] In the above described various embodiments, a wheel body **4** may be provided, that is, two wheels **44** are fixed to two sides of the spray cover, wherein the two wheels **44** are operable to support the weed removing tool during the use.

[0060] Referring to FIG. 1 and FIG. 14, the two wheels **44** are fixed to a positioning ring **41** via a first support post and a second support post. With such a positioning manner, the wheels **44** do not need to be directly arranged on the cover body **5**, thereby destroying the overall stability of the cover body **5** and prolonging the life time of the cover body **5**.

[0061] One end of the cover body **5** is a hollow fastener post and the other end thereof is a hollow horn body, wherein the horn body and the fastener post are integrally formed. The positioning ring **41** is internally provided with an

accommodation hole, and the fastener post passes through the accommodation hole and is fastened to the air outlet port **6**. The cover body **5** is directly connected to the air outlet port **6**, thereby preventing air leakage.

[0062] The positioning ring **41** is fixed on the fastener post **51** in the following fixing manner: the positioning ring is provided with at least one gap, the two ends of the positioning ring proximal to the gap extend outwardly to define a first extended sheet and a second extended sheet, wherein the first extended sheet is provided with a first screw hole and the second extended sheet is provided with a second screw hole mating with the first screw hole; a screw **43** passes through the first screw hole and the second screw hole to form a fastener member **42**, wherein the fastener member **42** fixes the positioning ring **41** to the cylinder of the cover body. In this way, the entire structure has a good fixing effect and a low manufacture cost.

[0063] Described above are some specific embodiments of the present invention, and the protection scope of the present invention is not limited to such embodiments. A person skilled in the art would understand that the present invention includes, but not limited to, the accompanying drawings and the content of the above specific embodiments. Any modification made without departing from the functions and structural principles of the present invention shall all fall within the protection scope defined by the appended claims.

What is claimed is:

1. A weed removing tool, comprising:
 - a tool body and a cover body arranged on an air outlet on the tool body, wherein the cover body is provided with a support frame forming a heat dissipation gap between an opening and an object to be processed during operation, the air outlet of the tool body is further provided with a root damage probe.
2. The weed removing tool according to claim 1, wherein the root damage probe is a hollow conical structure, and a top portion of the probe is provided with an air outlet hole.
3. The weed removing tool according to claim 2, wherein heat dissipation holes are arranged on a side wall of the root damage probe.
4. The weed removing tool according to claim 1, wherein an edge of the air outlet hole at the top portion the root damage probe is a blade portion.
5. The weed removing tool according to claim 1, wherein the root damage probe is a solid metal cone.
6. The weed removing tool according to claim 1, further comprising at least one wheel body arranged on a side face of the cover body and operable to support the weed removing tool.
7. The weed removing tool according to claim 1, further comprising a free edge, a plane where the freed edge of the cover body is located forming an inclined angle with a plane perpendicular to an air outlet direction of the air outlet.
8. The weed removing tool according to claim 1, wherein the tool body and the cover body are integrally formed.
9. The weed removing tool according to claim 1, wherein the support frame comprises a fixing portion connected to the cover body, and a support end acting on the object to be processed and forming the heat dissipation gap.

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