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# (54) DUAL-PURPOSE PROTECTIVE COVER FOR ANGLE GRINDER

(57) To solve the problem of inconvenience caused by frequent assembly and disassembly of existing guards of angle grinders, the invention provides a dual-use guard of an angle grinder. The dual-use guard comprises a first guard and a connecting portion, wherein the first guard comprises a semicircular or fan-shaped base and an enclosure arranged on an edge of the base, the enclosure extends towards one side of the base by a set length, an arc-shaped notch allowing a spindle of an angle grinder to penetrate through is formed in the center of the base, an extension raised towards a side away from the enclosure is arranged at the notch of the base, and a connecting portion connected to the angle grinder is fixedly arranged on the extension of the base. The dual-use guard further comprises a second guard, and the second guard is fixedly arranged on a side, away from the base, of the enclosure and shaped like a small cut circle. Debris can be effectively prevented from splashing out from the side face of the guard, the interference of the second guard in ground materials during angle grinding is reduced to facilitate operation, and the dual-use guard is simple in structure, low in cost and easy to machine and produce

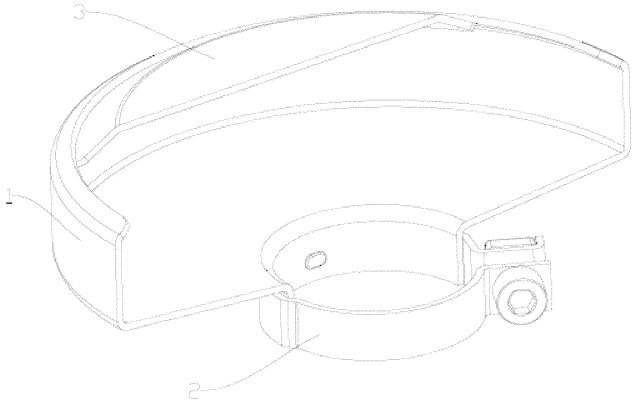


FIG. 1

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## Description

### Technical Field

**[0001]** The invention relates to the technical field of electric tools, in particular to a dual-use guard of an angle grinder.

### Background of the Invention

**[0002]** Angle grinders, also referred to as grinders or polishers, are tools mainly used for cutting and grinding materials such as glass and steel. To increase the safety coefficient of the angle grinder in use, a guard is often mounted on the angle grinder. Traditional guards of angle grinders are generally semicircular guards, and a baffle extending axially is arranged on an edge of the guard to lower the possibility of contact between limbs and a rotating disc. Because the baffle of the traditional guards has a limited area, debris can easily splash out from an opening in a side, away from the angle grinder, of the baffle, increasing the debris removal difficulty on one hand, and leading to some potential safety hazards on the other hand.

**[0003]** To solve the above problems, a detachable cover arranged on the guard is designed, for example, in Patent Publication No. CN202556182U and Patent Publication No. CN114423564A. As an improvement of the guard, the area of the cover is almost identical with the area of a side plate of a main body, such that debris can be effectively blocked during the cutting process, and the cover can be removed to facilitate polishing during the polishing process. However, in this improved technical solution, the detachable connection between the cover and the side plate of the main body leads to problems about the connection stability, and frequent assembly and disassembly of the cover result in much inconvenience. Therefore, a dual-use guard of an angle grinder is needed.

### Summary of the Invention

Technical problems

**[0004]** In the above improved technical solution, the detachable connection between the cover and the side plate of the main body leads to problems about the connection stability, and frequent assembly and disassembly of the cover result in much inconvenience.

Solution

**[0005]** The objective of the invention is to overcome the defects in the prior art by providing a dual-use guard of an angle grinder.

**[0006]** To solve the above problems, the invention adopts the following technical solution:

A dual-use guard of an angle grinder comprises a first guard and a connecting portion, wherein the first guard comprises a semicircular or fan-shaped base and an enclosure arranged on an edge of the base, the enclosure extends towards a side of the base by a set length, an arc-shaped notch allowing a spindle of an angle grinder to penetrate through is formed in a center of the base, an extension raised towards a side away from the enclosure is arranged at the notch of the base, and a connecting portion connected to the angle grinder is fixedly arranged on the extension of the base; the dual-use guard further comprises a second guard, and the second guard is fixedly arranged on a side, away from the base, of the enclosure and shaped like a small cut circle.

**[0007]** Further, an arc edge bending towards the center of the base is arranged at an end, away from the base, of the enclosure.

**[0008]** Further, a slope corresponding to the arc edge is arranged on an edge of the second guard, and the slope on the edge of the second guard is attached to an outer side or an inner side of the arc edge.

**[0009]** Further, the arc edge is connected to the second guard by welding or riveting.

**[0010]** Further, the second guard is arranged close to a middle area in a length direction of the enclosure.

**[0011]** Further, the connecting portion is a hoop.

**[0012]** Further, the hoop is fixedly connected to the extension by welding.

Beneficial effects

**[0013]** The invention has the following beneficial effects:

- The small second guard shaped like a small cut circle is arranged on the enclosure of the first guard, such that debris can be effectively prevented from splashing out from the side face of the guard, the interference of the second guard in ground materials during angle grinding is reduced to facilitate operation, and the dual-use guard is simple in structure, low in cost and easy to machine and produce;
- The connecting portion is designed as a hoop, such that the guard can be easily assembled on and disassembled from an angle grinder and can be replaced or cleaned easily;
- The arc edge bending towards the center of the base is arranged on the enclosure, such that debris can be further blocked, and the second guard can be connected to the enclosure easily.

### Brief Description of the Drawings

**[0014]**

FIG. 1 is a schematic overall view of a second guard attached to an inner side of an arc edge according to Embodiment 1;

FIG. 2 is a schematic overall view of the second guard attached to an outer side of the arc edge according to Embodiment 1;

FIG. 3 is a schematic view of the second guard according to Embodiment 1;

FIG. 4 is a schematic sectional view along A-A in FIG. 3;

FIG. 5 is an overall top view of Embodiment 1;

FIG. 6 is a schematic view along B-B in FIG. 5;

FIG. 7 is an enlarged view of area a in FIG. 6;

FIG. 8 is an overall sectional view of the second guard attached to the inner side of the arc edge according to Embodiment 1.

**[0015]** Reference signs: 1, first guard; 11, base; 111, extension; 12, enclosure; 13, arc edge; 2, connecting portion; 3, second guard; 31, slope.

## Detailed Description of Embodiments

**[0016]** Implementations of the invention are explained below with reference to specific embodiments, and those skilled in the art can easily understand other advantages and effects of the invention according to the contents disclosed here. The invention can also be implemented as or applied to other different specific embodiments, and various modifications or transformations may be made to all details in the specification based on different viewpoints and applications without departing from the spirit of the invention. It should be noted that the following embodiments and features in the following embodiments can be combined without conflicts.

**[0017]** It should be noted that the drawings in the following embodiments are merely used for illustratively explaining the basic concept of the invention, and components related to the invention in the drawings are drawn not according to the number, shape and size of the components in actual implementation. In actual implementation, the shape, number and scale of the components can be changed freely, and the overall arrangement of the components is more complex.

Embodiment 1:

**[0018]** As shown in FIGS. 1-8, a dual-use guard of an angle grinder comprises a first guard 1 and a connecting portion 2, wherein the first guard 1 comprises a semicircular or fan-shaped base 11 and an enclosure 12 arranged on an edge of base 11, and the enclosure 12 extends towards one side of the base 11 by a set length; an arc-shaped notch allowing a spindle of an angle grinder to penetrate through is formed in the center of the base 11; an extension 111 raised towards a side away from the enclosure 12 is arranged at the notch of the base 11; the connecting portion 2 connected to the angle grinder is fixedly arranged on the extension 111 of the base 11; the dual-use guard further comprises a second guard 3 fixedly arranged on a side, away from the base 11, of the enclosure 12; in this embodiment, the second guard 3 is shaped like a small cut circle, wherein in a case where a circle is cut in two parts along a straight line, the part with a small area is referred to as a small cut circle, and the part with a large area is referred to as a large cut circle; and the second guard 3 corresponds to one part of the base 11.

**[0019]** An arc edge 13 bending towards the center of the base 11 is arranged at an end, away from the base 11, of the enclosure 12, such that the edge of the enclosure 12 has a radian, thus improving the capacity to block debris generated during angle grinding or cutting process of the enclosure 12. In addition, the arc edge 13 may be connected to the second guard 3. A slope 31 corresponding to the arc edge 13 is arranged on an edge of the second guard 3. The slope 31 on the edge of the second guard 3 is attached to an outer side or inner side of the arc edge 13. In this embodiment, an overlap length L2 of the slope 31 on the second guard 3 and the arc edge 13 is 16 mm, as show in FIG. 7. The arc edge 13 is welded to the second guard 3. In this embodiment, four weld points are arranged between the arc edge 13 and the second guard 3, and the four weld points are distributed on the enclosure 12 at equal angles. In a case where the second guard 3 is attached to the outer side of the arc edge 13, as shown in FIG. 6, a height L1 of the second guard 3 exceeding the arc edge 13 is 5 mm. In a case where the second guard 3 is attached to the inner side of the arc edge 13, as shown in FIG. 8, a height L3 of the second guard 3 exceeding the arc edge 13 is 3.5 mm. It should be noted that in some other embodiments, the enclosure 12 and the second guard 3 may be connected in a riveted, threaded or clamped manner.

**[0020]** The second guard 3 is arranged close to a middle area in a length direction of the enclosure 12, and in this embodiment, the length direction of the enclosure 12 is an extension direction of the edge of the base 11. Because most debris generated by cutting or angle grinding during actual operation will splash towards the middle area in the length direction of the enclosure 12, the second guard 3 arranged in the middle area can effectively lower the possibility that the debris splashes out from the side face of the guard, such that more debris can be blocked with a small area.

**[0021]** The connecting portion 2 is a hoop located on the periphery of the extension 111, and the extension 111 can be fixedly connected to the angle grinder by tightening the hoop; and the hoop is fixedly connected to the extension 111 by welding. In some other embodiments, the hoop may be connected to the extension 111 in a riveted, threaded or clamped manner, or an outer side of the extension 111 may be inlaid in a groove of the hoop to realize connection.

**[0022]** In implementation, the small second guard 3 shaped like a small cut circle is arranged on the enclosure 12 of the first guard 1, such that debris can be effectively prevented from splashing out from the side face of the guard, and the interference of the second guard 3 in

ground materials during angle grinding is reduced; the first guard is completely identical in shape with existing guards of angle grinders, and the second guard can be added based on existing guards by welding or riveting, such that the cost is reduced; the connecting portion 2 is designed as a hoop, such that the guard can be easily assembled on and disassembled from an angle grinder and can be replaced or cleaned easily; and the arc edge 13 bending towards the center of the base 11 is arranged on the enclosure 12, such that debris can be further blocked, and the second guard 3 can be connected to the enclosure 12 easily.

**[0023]** The embodiment described above is merely a specific one of the invention and is not intended to limit the invention. Obviously, those skilled in the art can make various modifications and transformations in form and detail without departing from the principle and structure of the invention with reference to the contents and principle of the invention, and all these modifications and transformations based on the concept of the invention should still fall within the protection scope of the claims of the invention.

## Claims

1. A dual-use guard of an angle grinder, comprising a first guard (1) and a connecting portion (2), the first guard (1) comprising a semicircular or fan-shaped base (11) and an enclosure (12) arranged on an edge of the base (11), the enclosure (12) extending towards a side of the base (11) by a set length, an arc-shaped notch allowing a spindle of an angle grinder to penetrate through being formed in a center of the base (11), an extension (111) raised towards a side away from the enclosure (12) being arranged at the notch of the base (11), a connecting portion (2) connected to the angle grinder being fixedly arranged on the extension (111) of the base (11), wherein the dual-use guard further comprises a second guard (3), and the second guard (3) is fixedly arranged on a side, away from the base (11), of the enclosure (12) and shaped like a small cut circle.

2. The dual-use guard of an angle grinder according to Claim 1, wherein an arc edge (13) bending towards the center of the base (11) is arranged at an end, away from the base (11), of the enclosure (12).

3. The dual-use guard of an angle grinder according to Claim 2, wherein a slope (31) corresponding to the arc edge (13) is arranged on an edge of the second guard (3), and the slope (31) on the edge of the second guard (3) is attached to an outer side or an inner side of the arc edge (13).

4. The dual-use guard of an angle grinder according to Claim 3, wherein the arc edge (13) is connected to the second guard (3) by welding or riveting.

5. The dual-use guard of an angle grinder according to Claim 1, wherein the second guard (3) is arranged close to a middle area in a length direction of the enclosure (12).

6. The dual-use guard of an angle grinder according to Claim 1, wherein the connecting portion (2) is a hoop.

7. The dual-use guard of an angle grinder according to Claim 6, wherein the hoop is fixedly connected to the extension (111) by welding.

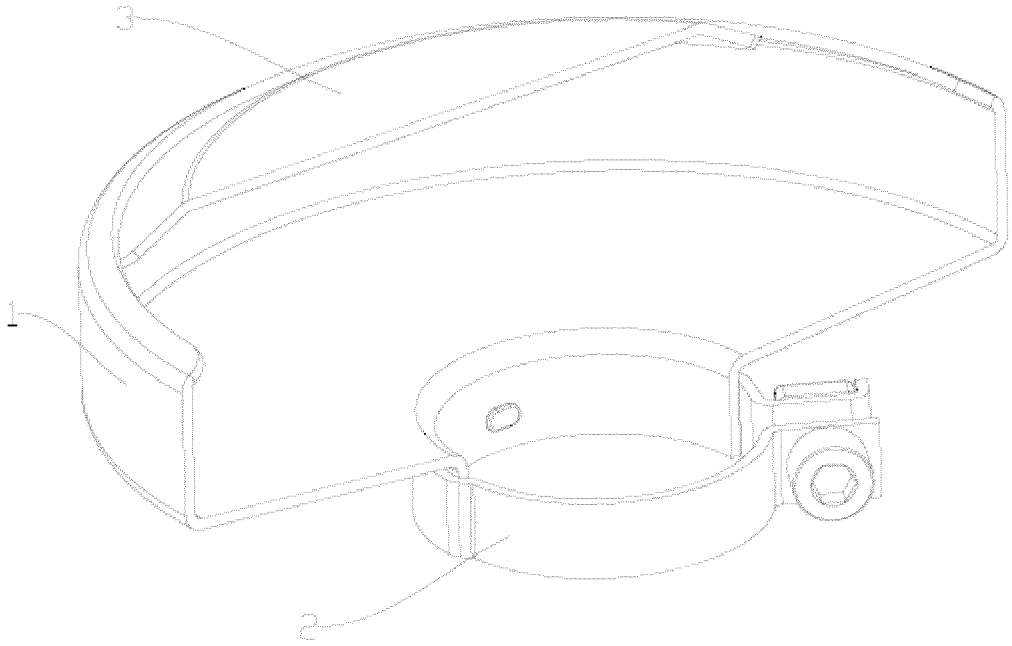


FIG. 1

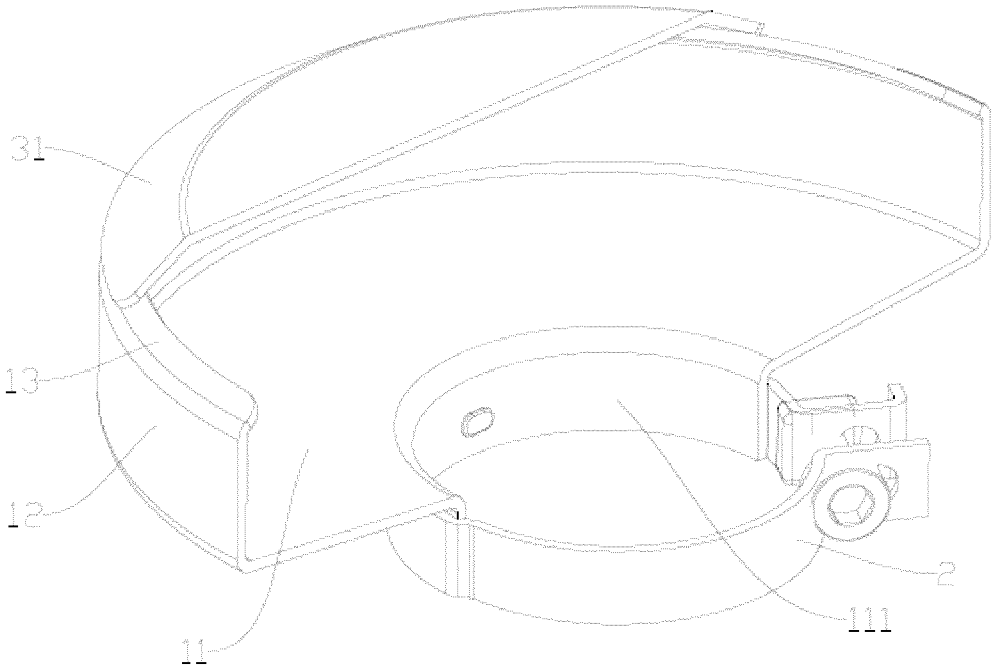


FIG. 2

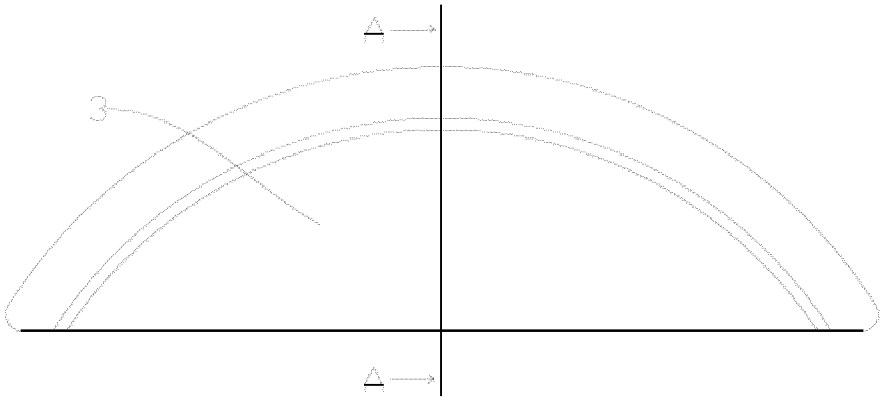


FIG. 3

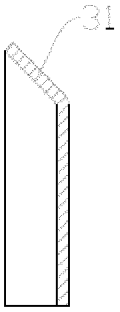


FIG. 4

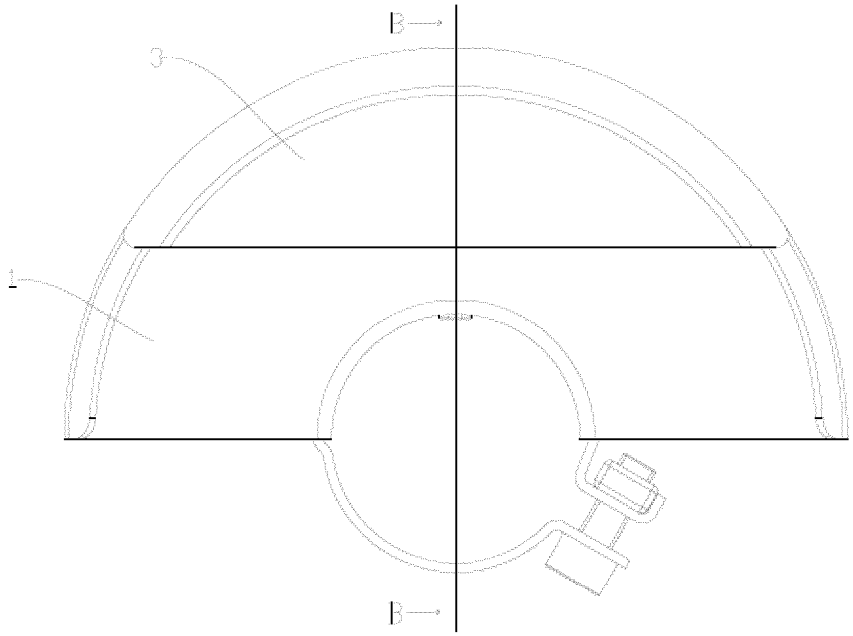


FIG. 5

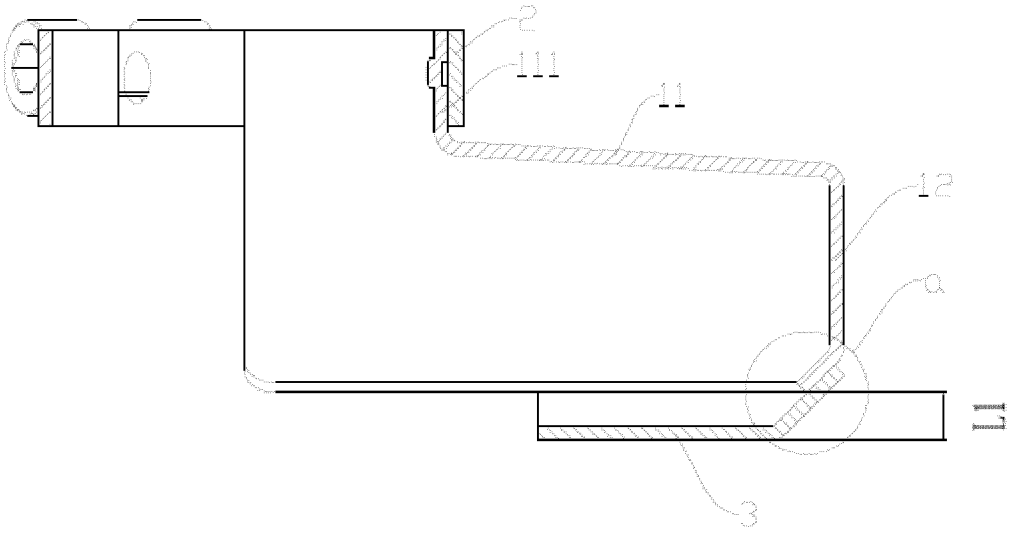


FIG. 6

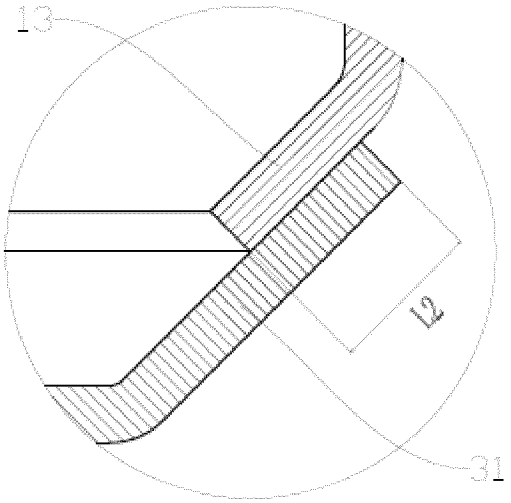


FIG. 7

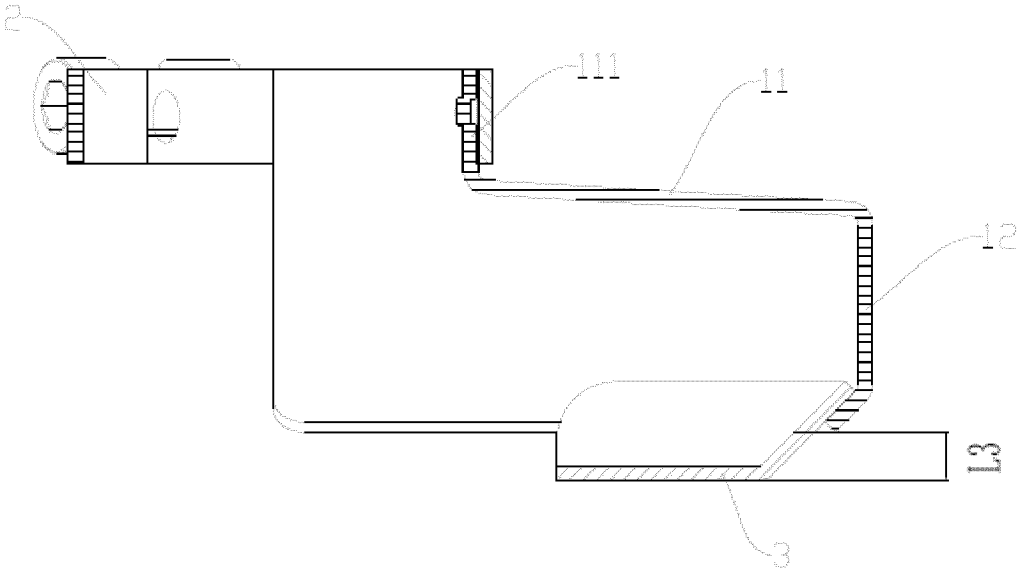


FIG. 8

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/CN2023/138011**

**A. CLASSIFICATION OF SUBJECT MATTER**

B24B55/05(2006.01)i; B24B23/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC:B24B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, ENTXTC, CNKI: 角磨, 护罩, 护盖, 焊, 铆接, 铆压, 干涉, 直线, 圆, 分割; VEN, WOTXT, USTXT, EPTXT, JPTXT: angle, grinder, protective cover, housing, weld, rivet, intervene, line, circle, separate.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| PX | CN 220051394 U (ZHEJIANG HUAFENG ELECTRIC TOOLS CO., LTD.) 21 November 2023 (2023-11-21)<br>claims 1-7 | 1-7 |
| A | CN 215588751 U (ZHEJIANG HUAFENG ELECTRIC TOOLS CO., LTD.) 21 January 2022 (2022-01-21)<br>description, specific embodiments, and figures 1-4 | 1-7 |
| A | CN 202556182 U (NANJING CHERVON INDUSTRY CO., LTD.) 28 November 2012 (2012-11-28)<br>entire document | 1-7 |
| A | DE 102008022294 A1 (C. & E. FEIN GMBH) 29 October 2009 (2009-10-29)<br>entire document | 1-7 |

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| **01 March 2024** | **09 March 2024** |
| Name and mailing address of the ISA/CN<br>**China National Intellectual Property Administration (ISA/CN)**<br>**China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** | Authorized officer<br><br>Telephone No. |

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**INTERNATIONAL SEARCH REPORT**
**Information on patent family members**

International application No.
**PCT/CN2023/138011**

| Patent document cited in search report | Publication date (day/month/year) | Patent family member(s) | Publication date (day/month/year) |
|---|---|---|---|
| CN 220051394 U | 21 November 2023 | None | |
| CN 215588751 U | 21 January 2022 | None | |
| CN 202556182 U | 28 November 2012 | CN 102632459 A | 15 August 2012 |
| DE 102008022294 A1 | 29 October 2009 | None | |

Form PCT/ISA/210 (patent family annex) (July 2022)

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- CN 202556182 U **[0003]**
- CN 114423564 A **[0003]**