



(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

- (43) Date of publication:
28.02.2024 Bulletin 2024/09
- (51) International Patent Classification (IPC):
C25D 17/00 (2006.01) C25D 17/02 (2006.01)
C25D 7/06 (2006.01)
- (21) Application number: 23806166.7
- (86) International application number:
PCT/CN2023/083503
- (22) Date of filing: 23.03.2023
- (87) International publication number:
WO 2024/007630 (11.01.2024 Gazette 2024/02)

- (84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN
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- (30) Priority: 07.07.2022 CN 202221765503 U

(54)

WATER ELECTROPLATING APPARATUS WITH DOUBLE-SIDED COATING FUNCTION

(57) The present disclosure relates to the technical field of electroplating devices, and in particular to a water electroplating device with a double-sided coating function. The water electroplating device includes a plating bath and a film transport mechanism. A first main roller and a second main roller are provided in the plating bath. A periphery of each of the first main roller and the second main roller is provided with a conductive tape. The film transport mechanism guides one side of a film to bypass

a left side of the first main roller and exit from a right side of the first main roller, and guides the other side of the film to bypass a right side of the second main roller and exit from a left side of the second main roller. The water electroplating device in the present disclosure avoids the need for the conductive tape to pass through a plating bath and avoids the need for a corresponding overflow tank to collect an electroplating solution, saving device investment and improving the safety of the plating bath.

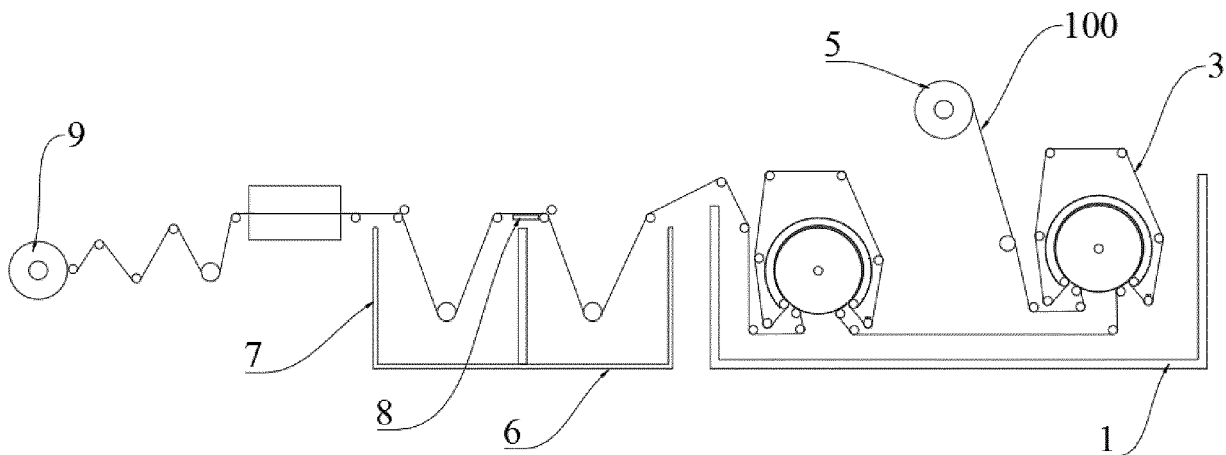


FIG. 1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of electroplating devices, and in particular to a water electroplating device with a double-sided coating function.

BACKGROUND

[0002] The current electroplating device has a problem. For example, in the water electroplating device for electroplating the surface of a flexible film substrate, provided by the technical solution of Chinese Patent CN214991962U, when the conductive tape is circularly fed at the outer side of the film, the conductive tape enters the electroplating solution, and the electroplating solution on the conductive tape follows the conductive tape to leave the plating bath. In this case, the electroplating solution on the conductive tape needs to be treated, for example, the electroplated copper is removed by polishing. In the technical solution, a first main roller and a second main roller are provided in the plating bath. The film bypasses the first main roller, reversely bypasses the second main roller, and exits from the plating bath. The left side of the conductive tape 331 is correspondingly provided with an overflow tank 313, and the electroplating solution on the conductive tape is processed in the overflow tank 313. In addition, when the conductive tape exits from the plating bath, the electroplating solution in the plating bath overflows into the overflow tank 313. On the right side of the conductive tape 331, the electroplating solution on the conductive tape is processed above, avoiding the need for the conductive tape. The overflow tank on the left side of the conductive tape increases the cost of the technical solution. Moreover, since the conductive tape exits from the plating bath, the structure is complex and not suitable for industrialization.

SUMMARY

[0003] The present disclosure provides a water electroplating device with a double-sided coating function. The present disclosure avoids the need for a conductive tape to pass through a plating bath and avoids the need for a corresponding overflow tank to collect an electroplating solution, saving device investment and improving the safety of the plating bath.

[0004] To solve the above technical problem, the present disclosure adopts the following technical solution:

The water electroplating device with a double-sided coating function includes a plating bath and a film transport mechanism, where a first main roller and a second main roller are provided in the plating bath; the first main roller and the second main roller are configured to plate two sides of a film; a periphery of each of the first main roller

and the second main roller is provided with a conductive tape; the conductive tape is tightly attached to an outer side of a portion of a film and is fed circularly; the periphery of each of the first main roller and the second main roller is further provided with an arc-shaped anode plate; the anode plate is connected to a positive electrode of an electroplating power supply, and the conductive tape is connected to a negative electrode of the electroplating power supply; and the film transport mechanism guides one side of the film to bypass a left side of the first main roller and exit from a right side of the first main roller, and guides the other side of the film to bypass a right side of the second main roller and exit from a left side of the second main roller.

[0005] Further, the film transport mechanism includes an unwinding mechanism and a winding mechanism; and the unwinding mechanism is configured to unwind the film, and the unwinding mechanism is configured to wind the coated film, thereby completing a complete electroplating process.

[0006] Further, the unwinding mechanism is provided between the first main roller and the second main roller; specifically, the unwinding mechanism is provided in an upper area between the first main roller and the second main roller; and the first main roller is located on the right side of the second main roller.

[0007] Further, the unwinding mechanism includes an unwinding shaft for unwinding the film and support shafts at two ends of the unwinding shaft; the unwinding shaft is driven by a motor to unwind the film; and the support shafts are driven by a motor to tilt, so as to adjust a feeding angle of the film, making it easy for the film to unwind.

[0008] Further, the water electroplating device includes a water washing bath and an antioxidant bath; and the film exiting from the left side of the second main roller further passes through the water washing bath and the antioxidant bath in sequence.

[0009] Further, an electrostatic eliminator is provided between the water washing bath and the antioxidant bath; and the electrostatic eliminator is configured to eliminate static electricity generated during the transport of the film.

[0010] The beneficial effects of the present disclosure are as follows:

In the present disclosure, the placement position and winding method of the unwinding mechanism are adjusted, such that the film does not need to pass through the plating bath and the corresponding overflow tank is avoided. The design reduces device investment and improves the safety of the plating bath.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] To describe the technical solutions in the embodiment of the present disclosure or in the prior art more clearly, the following briefly introduces the drawings required for describing the embodiment or the prior art. Apparently, the drawings in the following description

show merely some embodiments of the present disclosure, and a person of ordinary skill in the art may still derive other drawings from these drawings without creative efforts.

FIG. 1 is a structural diagram of a water electroplating device with a double-sided coating function according to the present disclosure;

FIG. 2 is an internal structural diagram of a plating bath according to the present disclosure; and

FIG. 3 is a schematic diagram of an unwinding mechanism according to the present disclosure.

Reference Numerals:

[0012] 1. plating bath; 201. first main roller; 202. second main roller; 3. conductive tape; 4. anode plate; 5. unwinding mechanism; 51. unwinding shaft; 52. support shaft; 6. water washing bath; 7. antioxidant bath; 8. electrostatic eliminator; 9. winding mechanism; and 100. film.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] To help the present disclosure understood by those skilled in the art, the present disclosure is further described below with reference to the embodiments and drawings, which is not intended to limit the present disclosure.

Embodiment

[0014] As shown in FIGS. 1 to 3, a water electroplating device with a double-sided coating function includes plating bath 1 and film 100 transport mechanism. First main roller 201 and second main roller 202 are provided in the plating bath 1. The first main roller 201 and the second main roller 202 are configured to plate two sides of film 100. A periphery of each of the first main roller 201 and the second main roller 202 is provided with conductive tape 3. The conductive tape 3 is tightly attached to an outer side of a portion of the film 100 and is fed circularly. The periphery of each of the first main roller 201 and the second main roller 202 is further provided with arc-shaped anode plate 4. The anode plate 4 is connected to a positive electrode of an electroplating power supply, and the conductive tape 3 is connected to a negative electrode of the electroplating power supply. The film 100 transport mechanism guides one side of the film 100 to bypass a left side of the first main roller 201 and exit from a right side of the first main roller 201, and guides the other side of the film 100 to bypass a right side of the second main roller 202 and exit from a left side of the second main roller 202.

[0015] As shown in FIG. 1 or 2, the first main roller and the second main roller are arranged sequentially from a right side of the plating bath (from right to left). Therefore, an uncoated film bypasses the right side of the first main roller, passes over the first main roller, and exits from the

left side of the first main roller. The film then bypasses the right side of the second main roller, passes over the second main roller, and exits from the left side of the second main roller. In this way, a complete film laying process is completed.

[0016] In this embodiment, the film 100 transport mechanism includes unwinding mechanism 5 and winding mechanism 9. The unwinding mechanism 5 is configured to unwind the film 100, and the unwinding mechanism 9 is configured to wind the coated film 100, thereby completing a complete electroplating process. Specifically, the unwinding mechanism 5 is provided between the first main roller 201 and the second main roller 202. Specifically, it can be provided in an upper area between the first main roller 201 and the second main roller 202. Because the film 100 first bypasses the left side of the first main roller 201, the unwinding mechanism 5 is preferably located in an upper area close to the left side of the first main roller 201.

[0017] Specifically, the electroplating process is as follows. The film 100 bypasses the left side of the first main roller 201 and exits from the right side of the first main roller 201. The bypass and exit of the conductive tape 3 is completed in an area over the first main roller 201. After the conductive tape 3 exits from the right side of the first main roller 201, it bypasses the left side of the second main roller 202, and exits from the right side of the second main roller 202. The bypass and exit of the conductive tape 3 is completed in an area over the second main roller 202. The conductive tape 3 located above the first main roller 201 and the second main roller 202 is wiped to prevent an electroplating solution, carried by the conductive tape 3 from the plating bath 1, from dripping onto the first main roller and the second main roller or the film 100. In the setting of the conductive tape 3, the conductive tape 3 does not pass through the plating bath 1, so there is no need for an overflow tank. The anode plate 4 at the periphery of the first main roller 201 (or the second main roller 202) is connected to the positive electrode of the electroplating power supply (not shown in the figure), and the conductive tape 3 on the first main roller 201 (or the second main roller 202) is connected to the negative electrode of the electroplating power supply (not shown in the figure). In this way, cations in the electroplating solution are deposited onto the film 100.

[0018] Specifically, the unwinding mechanism 5 includes unwinding shaft 51 for unwinding the film 100 and support shafts 52 at two ends of the unwinding shaft 51. The unwinding shaft 51 is driven by a motor (not shown in the figure). The support shafts 52 can also be driven by a motor (not shown in the figure). The motor (not shown in the figure) drives the unwinding shaft 51 to rotate, thereby completing the unwinding of the film 100. The motor drives the support shafts 52 to tilt within a certain range. After the support shafts 52 are tilted, heights of the unwinding shafts 51 are adjusted, so as to adjust a feeding (unwinding) angle of the film 100, making

it easy for the film 100 to unwind.

[0019] In the present disclosure, the water electroplating device further includes water washing bath 6 and antioxidant bath 7. The film 100 exiting from the left side of the second main roller 202 further passes through the water washing bath 6 and the antioxidant bath 7 in sequence.

[0020] Specifically, electrostatic eliminator 8 is provided between the water washing bath 6 and the antioxidant bath 7. The electrostatic eliminator 8 is configured to eliminate static electricity generated during the transport of the film 100. The electrostatic eliminator 8 can be selected from existing models.

[0021] A specific work process is as follows. The plating bath holds the electroplating solution, the water washing bath holds distilled water, and the antioxidant bath holds an antioxidant solution. When the unwinding mechanism unwinds the film, the film bypasses the left side of the first main roller and exits from the right side of the first main roller. During this process, the conductive tape on the first main roller electroplates the film. The film exiting from the first main roller bypasses the right side of the second main roller and exits from the left side of the second main roller. During this process, the conductive tape on the second main roller electroplates the film. The film exiting from the second main roller is wiped (to remove the electroplating solution) and then enters the water washing bath for water washing. After the water washing, the film reaches the antioxidant bath for antioxidant treatment. After the antioxidant treatment, the film is dried, thereby completing the electroplating process of the film.

[0022] The above embodiment is a preferred implementation of the present disclosure. In addition, the present disclosure can also be implemented in other ways, and any obvious replacement without departing from the concept of the technical solutions in the present disclosure falls within the protection scope of the present disclosure.

[0023] In the water electroplating device with a double-sided coating function provided by the present disclosure, the placement position and winding method of the unwinding mechanism are adjusted, such that the film does not need to pass through the plating bath and the corresponding overflow tank is avoided. The design reduces device investment and improves the safety of the plating bath. Therefore, the water electroplating device with a double-sided coating function provided by the present disclosure has practicality.

Claims

1. A water electroplating device with a double-sided coating function, **characterized by** comprising a plating bath (1) and a film transport mechanism, wherein a first main roller (201) and a second main roller (202) are provided in the plating bath (1); a

periphery of each of the first main roller (201) and the second main roller (202) is provided with a conductive tape (3); the conductive tape (3) is tightly attached to an outer side of a portion of a film and is fed circularly; the periphery of each of the first main roller (201) and the second main roller (202) is further provided with an arc-shaped anode plate (4); the anode plate (4) is connected to a positive electrode of an electroplating power supply, and the conductive tape (3) is connected to a negative electrode of the electroplating power supply; the film transport mechanism guides one side of the film to bypass a left side of the first main roller (201) and exit from a right side of the first main roller (201), and guides the other side of the film to bypass a right side of the second main roller (202) and exit from a left side of the second main roller (202); and the conductive tape (3) is provided over the first main roller (201) and the second main roller (202).

2. The water electroplating device with the double-sided coating function according to claim 1, **characterized in that** the film transport mechanism comprises an unwinding mechanism (5) and a winding mechanism (9).
3. The water electroplating device with the double-sided coating function according to claim 2, **characterized in that** the unwinding mechanism (5) is provided between the first main roller (201) and the second main roller (202); and the first main roller (201) is located on the right side of the second main roller (202).
4. The water electroplating device with the double-sided coating function according to claim 2, **characterized in that** the unwinding mechanism (5) comprises an unwinding shaft (51) for unwinding the film and support shafts (52) at two ends of the unwinding shaft (51).
5. The water electroplating device with the double-sided coating function according to claim 3, **characterized in that** the water electroplating device further comprises a water washing bath (6) and an antioxidant bath (7); and the film exiting from the left side of the second main roller (202) further passes through the water washing bath (6) and the antioxidant bath (7) in sequence.
6. The water electroplating device with the double-sided coating function according to claim 5, **characterized in that** an electrostatic eliminator (8) is provided between the water washing bath (6) and the antioxidant bath (7).

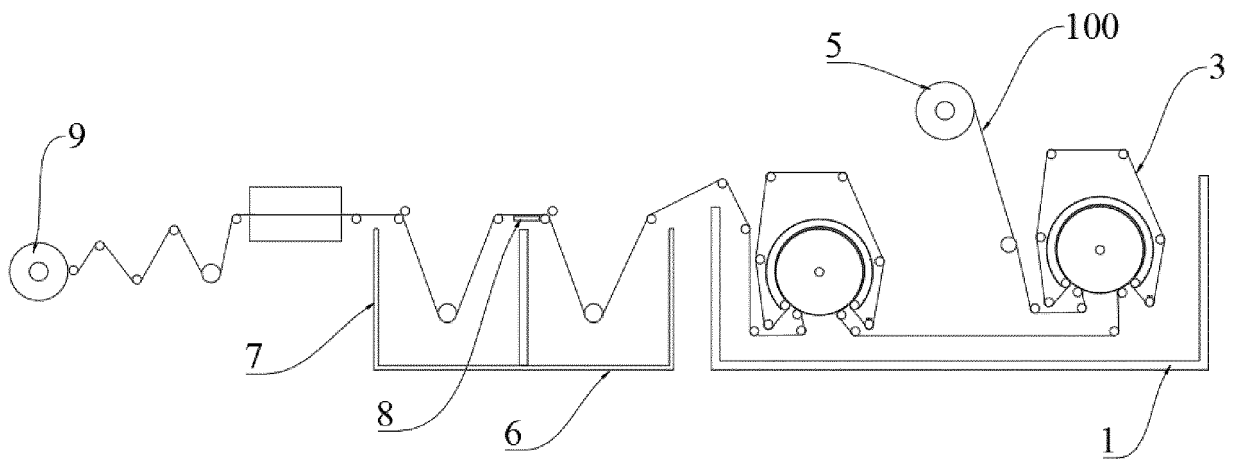


FIG. 1

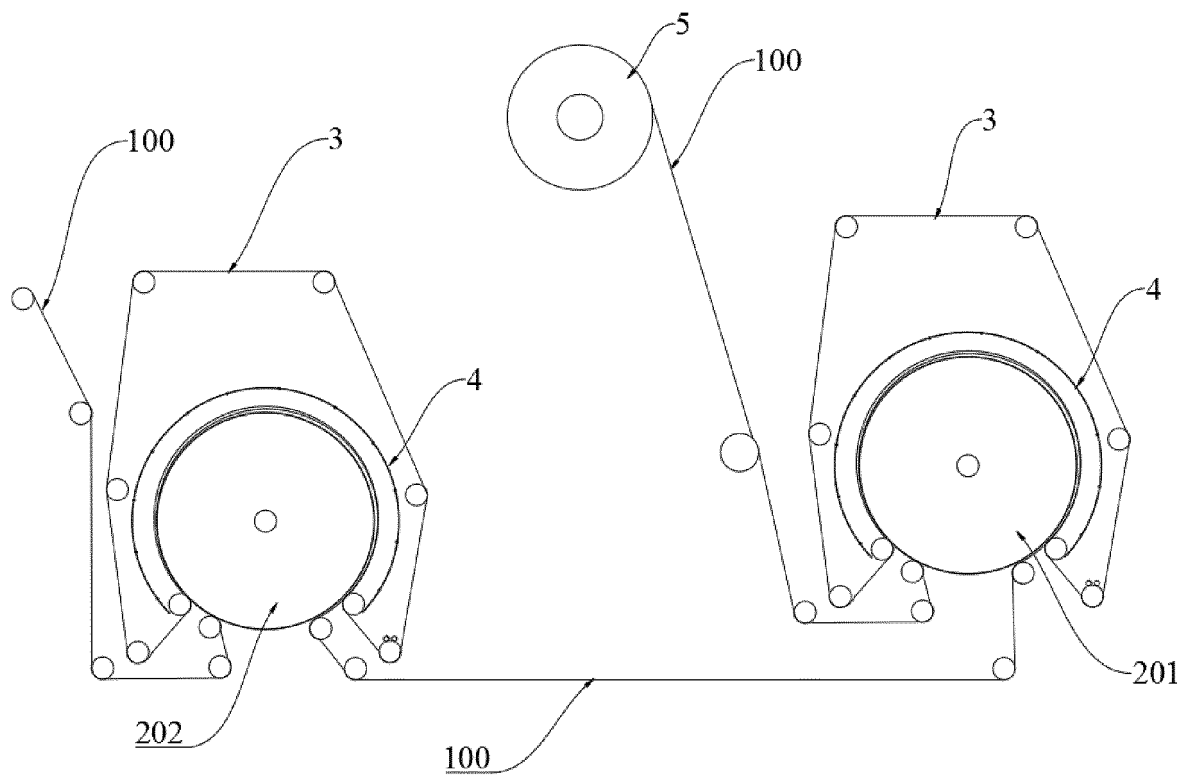


FIG. 2

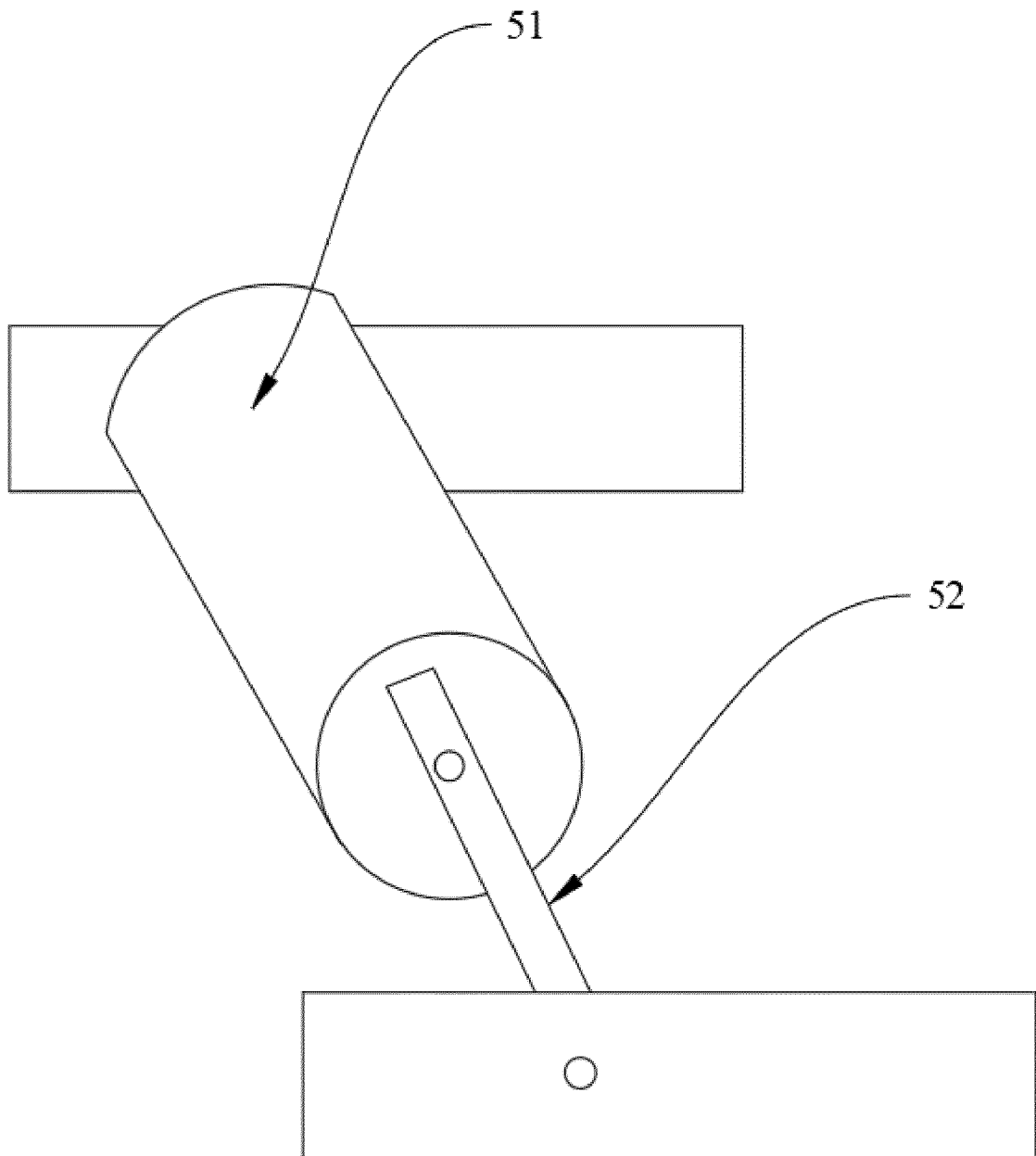


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/083503

A. CLASSIFICATION OF SUBJECT MATTER

C25D17/00(2006.01)i; C25D17/02(2006.01)i; C25D7/06(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)

C25D

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)

CNXTX, ENTXTX, VEN, DWPI, ENTXT, CNKI, CJFD: 重庆金美新材料科技有限公司, 刘欣, 臧世伟, 电镀, 镀敷, 镀覆, 膜, 条, 带, 卷, 箔, 双面, 两面, 主辊, 辊, 上方, 上表面, 上面, 包覆, 包裹, 缠绕, 导电带, 导电皮带, 导电铜带, 右侧, 左侧, 绕出, 绕过, 右, 左, 左到右, 右到左, plat+, electroplat+, electrodeposit+, electroly+, deposit+, film+, strip+, foil, both, double, side +, face+, main roller, roll+, above, over, top, upper surface, wrap+, conduct+, band, belt+, left, right

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 218115633 U (CHONGQING JIMAT NEW MATERIAL TECHNOLOGY CO., LTD.) 23 December 2022 (2022-12-23) claims 1-6	1-6
PX	CN 217459634 U (CHONGQING JIMAT NEW MATERIAL TECHNOLOGY CO., LTD.) 20 September 2022 (2022-09-20) embodiment 2	1-6
Y	CN 214991962 U (CHONGQING JIMAT NEW MATERIAL TECHNOLOGY CO., LTD.) 03 December 2021 (2021-12-03) description, paragraphs [0035]-[0063], and figures 1-2	1-6
Y	CN 215947431 U (CHONGQING JIMAT NEW MATERIAL TECHNOLOGY CO., LTD.) 04 March 2022 (2022-03-04) description, paragraphs [0030]-[0043], and figures 1-2	1-6

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

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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

18 July 2023

Date of mailing of the international search report

21 July 2023

Name and mailing address of the ISA/CN

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Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/083503

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

International application No.

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REFERENCES CITED IN THE DESCRIPTION

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