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(54) **LED LAMP AND MERCURY LAMP INTERCHANGING STRUCTURE**

(57) Disclosed is an LED lamp and mercury lamp interchanging structure, comprising a base device (10), a connector device (20) arranged at one end of the base device (10), and an LED lamp house body (30) and a mercury lamp body (40) respectively slidably connected to the base device (10), wherein the connector device (20) comprises a power supply connector (21), an air pipe connector (22), and a water pipe connector (23); an inner end of the LED lamp house body (30) is provided with a first power receiving connector (31) opposite to and matching with the power supply connector (21), and

a water port connector (32) opposite to the water pipe connector (23); and an inner end of the mercury lamp body (40) is provided with a second power receiving connector (41) opposite to and matching with the power supply connector (21), and an air suction port (42) opposite to the air pipe connector (22). The LED lamp and mercury lamp interchanging structure can rapidly and conveniently realize the interchanging between an LED lamp and a mercury lamp, facilitates simplified equipment, is easy to operate, and can improve the production efficiency.

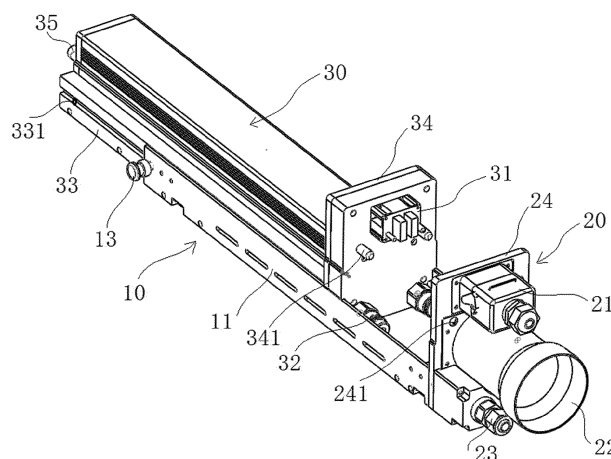


FIG. 1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a technical field of ultraviolet curing device, and in particular, to an interchangeable structure of a LED lamp and a mercury lamp.

BACKGROUND

[0002] Existing mercury lamp ultraviolet curing device has disadvantages such as high energy consumption, and ozone, dust, and noise during a curing process. With the development of light emitting diode-ultraviolet (LED-UV) semiconductor technology, LED technology is gradually replacing mercury lamps.

[0003] LED curing has obvious technical advantages, but there is a demand for ink manufacturers to develop new photoinitiators for LED wavelengths, in order to achieve the best curing and energy-saving effects of the LEDs. At present, we are in a period of alternation between new and old technologies, research and development progress of some inks and varnish photoinitiators cannot fully meet production requirements of the LED-UV. In some special printing processes, mercury lamps still cannot be replaced, and thus the mercury lamps still have a certain market.

[0004] In this case, in order to take into account energy saving and environmental protection, while ensuring the printing process, there is a demand for both the LED-UV and the conventional mercury lamp in the same curing system. However, since the LED-UV is powered by a direct current (DC) constant current source and dissipates heat through water cooling, and the mercury lamp is powered by an alternate current (AC) power supply and dissipates heat through air cooling, according to the conventional technology, the LED-UV and the mercury lamp hybrid device has to be equipped with two sets of power supplies and cooling devices simultaneously, which will undoubtedly increase complexity of a line connection and increase a volume of the device. Moreover, due to the requirements of the printing process for the use of the two types of lamps, it may be necessary to frequently replace the LED-UVs or the mercury lamps on workstations. In this case, power supply cables and the cooling devices must be replaced together. Therefore, the workload is large and the operation is too cumbersome.

SUMMARY

[0005] In order to solve the above-mentioned problems in the background, an object of the present disclosure is to provide an interchangeable structure of a LED lamp and a mercury lamp, which can quickly and conveniently interchange the LED lamp and the mercury lamp, and be beneficial to simplify the device and facilitate operation,

and improve production efficiency.

[0006] Accordingly, the present disclosure provided an interchangeable structure of a LED lamp and a mercury lamp, which includes: a base device; a connector device provided at an end of the base device, the connector device including a power supply connector, an air pipe connector, and a water pipe connector; and a LED lamp box body and a mercury lamp body that are slidably connected to the base device, respectively.

[0007] An inner end of the LED lamp box body is provided with a first power connector corresponding to and matching the power supply connector, and a nozzle connector corresponding to the water pipe connector.

[0008] An inner end of the mercury lamp body is provided with a second power connector corresponding to and matching the power supply connector, and an air intake port corresponding to the air pipe connector.

[0009] As a preferred solution, the base device includes opposed guiding rails and a bottom plate connected to the guiding rails. An outer side of the LED lamp box body is provided with a first sliding rail slidably fitted with the guiding rail. An outer side of the mercury lamp body is provided with a second sliding rail slidably fitted with the guiding rail.

[0010] The connector device further includes a connector mounting plate fixedly connected to a first end of the guiding rail. The power supply connector, the air pipe connector, and the water pipe connector are mounted on the connector mounting plate.

[0011] As a preferred solution, both ends of the guiding rail are respectively connected to the bottom plate. A second end of the guiding rail is provided with a plug pin. The first sliding rail and the second sliding rail are each provided with a pin hole matching the plug pin.

[0012] As a preferred solution, the inner end of the LED lamp box body is provided with a first inner end cover. The first power connector and the nozzle connector are provided on the first inner end cover.

[0013] The inner end of the mercury lamp body is provided with a second inner end cover. The second power connector and the air intake port are provided on the second inner end cover.

[0014] As a preferred solution, the first inner end cover and the second inner end cover are both provided with a guiding post facing the connector device. The connector device is provided with a guiding hole corresponding to the guiding post. A fitting between the guiding post and the guiding hole precedes a contact between the first power connector and the power supply connector, and precedes a contact between the second power connector and the power supply connector.

[0015] As a preferred solution, the plug pin is an elastic plug pin. During a sliding process of the LED lamp box body and the mercury lamp body towards the connector device, the elastic plug pin is capable of being inserted into the pin hole automatically.

[0016] As a preferred solution, the power supply connector is a female power supply connector. The first pow-

er connector and the second power connector are male power supply connectors.

[0017] As a preferred solution, the nozzle connector and the water pipe connector are self-sealing fast connectors.

[0018] As a preferred solution, the nozzle connector is a self-sealing fast male connector. The water pipe connector is a self-sealing fast female connector.

[0019] As a preferred solution, outer ends of the LED lamp box body and the mercury lamp body are provided with handles.

[0020] Compared with the prior art, the advantages of the present disclosure are as follows:

[0021] The interchangeable structure of the LED lamp and the mercury lamp of the present disclosure includes the base device, the connector device provided at an end of the base device, and the LED lamp box body and the mercury lamp body that are slidably connected to the base device, respectively. The connector device includes the power supply connector, the air pipe connector, and the water pipe connector. The base device can be mounted on the machine table. The first power connector corresponding to and matching the power supply connector and the nozzle connector corresponding to the water pipe connector are provided at the inner end of the LED lamp box body, and the second power connector corresponding to and matching the power supply connector and the air intake port corresponding to the air pipe connector are provided at the inner end of the mercury lamp body. The power supply connector is electrically connecting to a digital power supply. When the LED lamp box is required for a curing process, the LED lamp box body is inserted into the base device, and then, the LED lamp box body is slid towards the connector device, such that the first power connector is connected to the power supply connector, while the nozzle connector is connected to the water pipe connector, and the digital power supply is switched to supply power to the power supply connector in a DC power supplying mode. In this way, the DC power supplying mode and a water cooling heat dissipation are implemented. When the mercury lamp is required for a curing process, the LED lamp box body is pulled out from the base device, and then, the mercury lamp body is inserted into the base device and is slid towards the connector device, such that the second power connector is connected to the power supply connector. Moreover, the air intake port is communicated with the air pipe connector, and the air pipe connector is connected to a fan through an air pipe. In this case, the digital power supply is switched to an AC power supplying mode, and supplies power to the power supply connector, and then, the fan is started. Therefore, the AC power supply mode and the air cooling heat dissipation mode are implemented. Therefore, only through one insertion operation towards the connector device, the rapid switching between the LED lamp box and the mercury lamp can be implemented. Compared with conventional operations (pulling out cables, a water pipe, screwing and locking, etc.), the

operation of the present disclosure is very convenient and efficient, and can greatly improve work efficiency. Moreover, the interchangeable structure shares the same base device, which can adapt to both the LED-UV and the mercury lamp, thus simplifying the device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

FIG. 1 is a schematic view of an interchangeable structure of a LED lamp and a mercury lamp in a state of replacing a LED lamp box according to an embodiment of the present disclosure.

FIG. 2 is a structural schematic view of FIG. 1 from another aspect.

FIG. 3 is a structural schematic view of a base device and a connector device according to an embodiment of the present disclosure.

FIG. 4 is a schematic view of an interchangeable structure of a LED lamp and a mercury lamp in a state of replacing the mercury lamp according to an embodiment of the present disclosure.

[0023] In the figures, 10- base device, 11- guiding rail, 12- bottom plate, 13- plug pin, 20- connector device, 21- power supply connector, 22- air pipe connector, 23- water pipe connector, 24- connector mounting plate, 241- guiding hole, 30- LED lamp box body, 31- first power connector, 32- nozzle connector, 33- first sliding rail, 331- first pin hole, 34- first inner end cover, 341- first guiding post, 35- first handle, 40- mercury lamp body, 41- second power connector, 42- air intake port, 43- second sliding rail, 431- second pin hole, 44- second inner end cover, 441- second guiding post, 45- second handle.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0024] Specific embodiments of the present disclosure will be further described in detail below in conjunction with the drawings and embodiments. The following embodiments are used to illustrate the present disclosure, but not to limit the scope of the present disclosure.

[0025] In the description of the present disclosure, it should be understood that orientation or positional relationships indicated by terms "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", etc. are based on orientation or positional relationship shown in the drawings, which are merely to facilitate the description of the present disclosure and simplify the description, not to indicate or imply that the device or elements must have a particular orientation, be constructed and operated in a particular orientation, and therefore cannot be construed as a limitation on the present disclosure. In addition, terms "first", "second", etc. are only used for descriptive purposes, and cannot be understood as indicating or implying relative importance.

[0026] Referring to FIGS. 1, 2 and 4, which schematically show an interchangeable structure of a LED lamp and a mercury lamp according to the present disclosure. The interchangeable structure includes a base device 10, a connector device 20, a LED lamp box body 30, and a mercury lamp body 40. The base device 10 is used to be mounted on a machine base. The connector device 20 is provided at an end of the base device 10. The LED lamp box body 30 and the mercury lamp body 40 can be slidably connected to the base device 10. An inner end of the LED lamp box body 30 is provided with a first power connector 31 and a nozzle connector 32. An inner end of the mercury lamp body 40 is provided with a second power connector 41 and an air intake port 42. When the LED lamp box body 30 and the mercury lamp body 40 are mounted and inserted into the base device 10, the first power connector 31 and the second power connector 41 are arranged opposite to and adapted to a power supply connector 21. In addition, the nozzle connector 32 arranged opposite to a water pipe connector 23. The air intake port 42 is arranged opposite to an air pipe connector 22. The power supply connector 21 is used to be electrically connected to a digital power supply. The digital power supply can selectively supply power to the power supply connector 21 in a DC power supplying mode or an AC power supplying mode.

[0027] For the interchangeable structure based on the above technical features, when the LED lamp box is required for a curing process, the LED lamp box body 30 is inserted into the base device 10, and the LED lamp box body 30 is then slid, such that the first power connector 31 is connected to the power supply connector 21, while the nozzle connector 32 is connected to the water pipe connector 23, and the digital power supply is switched to supply power to the power supply connector 21 in the DC power supplying mode. In this way, the power supply connector 21 supplies power to the LED lamp box through the first power connector 31, and thus the DC power supplying mode and a water cooling heat dissipation are implemented, and the requirements of the LED lamp box body 30 are met. In this embodiment, the digital power supply can be manually switched to the AC power supplying mode or DC power supplying mode. Alternatively, a smart digital power supply can be preferably used to automatically detect whether the LED lamp or the mercury lamp is mounted, and then automatically switches to the AC or DC power supplying mode. When the mercury lamp is required for the curing process, the LED lamp box body 30 is pulled out from the base device 10 to separate the LED lamp box body 30 and the connector device 20, and then, the mercury lamp body 40 is inserted into the base device 10 and is slid towards the connector device 20, such that the second power connector 41 is connected to the power supply connector 21. Moreover, the air intake port 42 is communicated with the air pipe connector 22, and the air pipe connector 22 is connected to a fan through an air pipe to realize the connection of an air path. In this case, the digital power

supply is switched to the AC power supplying mode, and supplies power to the power supply connector 21, and then, the fan is turned on. Therefore, the AC power supply mode and the air cooling heat dissipation mode are implemented. Therefore, it only requires the operations of inserting the LED lamp box main body 30 and the mercury lamp body 40 to implement the rapid switching between the LED lamp box and the mercury lamp. Compared with conventional operations (pulling out cables, a water pipe, screwing and locking, etc.), the operations of the present disclosure are very convenient and efficient, and can greatly improve work efficiency. Moreover, the interchangeable structure shares the same base device 10, which can adapt to both the LED-UV and the mercury lamp, thus simplifying the device.

[0028] It should be noted that curing principles of the LED lamp box body 30 and the mercury lamp body 40 are known in the prior art, and thus for structures in which the LED-UV lamp source and the mercury lamp are each used to cure a coating (paint), ink, adhesive (glue) or other potting sealants, their detailed internal structures and working principles will not be repeated here.

[0029] Preferably, as shown in FIG. 3, the base device 10 includes opposed guiding rails 11 and a bottom plate 12 connected to the guiding rail 11. An outer side of the LED lamp box body 30 is provided with a first sliding rail 33 slidably fitted with the guiding rail 11, such that the LED lamp box body 30 can slide freely along the guiding rail 11. An outer side of the mercury lamp body 40 is provided with a second sliding rail 43 slidably fitted with the guiding rail 11, such that the LED lamp box body 30 can slide freely along the guiding rail 11. The connector device 20 further includes a connector mounting plate 24 fixedly connected to a first end of the guiding rail 11. The power supply connector 21, the air pipe connector 22, and the water pipe connector 23 are mounted on the connector mounting plate 24. For example, when mounting the LED lamp box body 30, the first sliding rail 33 is firstly inserted into the guiding rail 11 of the base device 10, and then the LED lamp box body 30 is slid towards the connector device 20 on the guiding rail 11, such that the inner end of the LED lamp box body 30 (such as the right end in FIG. 1) is connected to the connector mounting plate 24, the first power connector 31 is connected to the power supply connector 21, and the nozzle connector 32 is connected to the water pipe connector 23. For example, when mounting mercury lamp body 40, the second sliding rail 43 is firstly inserted into the guiding rail 11 of the base device 10, and then the mercury lamp body 40 is slid towards the connector device 20 on the guiding rail 11, such that the inner end of the mercury lamp body 40 (such as the right end in FIG. 4) is connected to the connector mounting plate 24. In this way, the second power connector 41 is connected to the power supply connector 21, and the air intake port 42 is connected to the air pipe connector 22.

[0030] Further preferably, as shown in FIG. 3, both ends of the guiding rail 11 are connected to the bottom

plates 12, respectively, which is beneficial to enhance the stability of the guiding rail 11. Moreover, an irradiating space is formed between the two bottom plates 12, such that after the LED lamp box body 30 or the mercury lamp body 40 is slid in place on the guiding rail 11, that is, after the LED lamp box body 30 or the mercury lamp body 40 is connected to the connector device 20, the process of curing the coating (paint), ink, adhesive (glue) or other potting sealants is implemented through the irradiating space. A second end of the guiding rail 11 (the left end in FIG. 3) is provided with a plug pin 13. The first sliding rail 33 and the second sliding rail 43 are each provided with a pin hole matching the plug pin 13. Specifically, the pin hole of the first sliding rail 33 is a first pin hole 331, and the pin hole of the second sliding rail 43 is a second pin hole 431. In this embodiment, the plug pin 13 is preferably adopted as an elastic plug pin 13. In this way, during a sliding process of the LED lamp box body 30 and the mercury lamp body 40 towards the connector device 20, when the LED lamp box body 30 or the mercury lamp body 40 starts to contact the connector mounting plate 24 on their right side, the elastic plug pin 13 is just aligned with the pin hole, and thus the elastic plug pin 13 can be inserted into the first pin hole 331 or the second pin hole 431 automatically, to achieve self-locking. In this way, the LED lamp box body 30 or the mercury lamp body 40 is fixed to the base device 10. In this case, the first power connector 31 is connected to the power supply connector 21, and the nozzle connector 32 is connected to the water pipe connector 23. Alternatively, the second power connector 41 is connected to the power source connector 21, and the air intake port 42 is connected to the air pipe connector 22. When the LED lamp box body 30 or the mercury lamp body 40 is required to be detached for interchanging, it is only necessary to pull the elastic plug pin 13 outward to separate the plug pin 13 from the pin hole, and thus the LED lamp box body 30 or the mercury lamp body 40 can be freely slid along the base device 10, and thus the LED lamp box body 30 or the mercury lamp body 40 can be removed from the base device 10. Especially, when the LED lamp box body 30 is detached, since the LED lamp box body 30 is subjected to a pressure from the water pipe connector 23, the LED lamp box body 30 will pop up to the left along the guiding rail 11 under the water pressure, which is beneficial to the detachment of the LED lamp box body 30.

[0031] Specifically, as shown in FIG. 1, the inner end of the LED lamp box body 30 is provided with a first inner end cover 34. The first power connector 31 and the nozzle connector 32 are provided on the first inner end cover 34. When mounting the LED lamp box body 30, the first inner end cover 34 is connected to the connector mounting plate 24, such that the first power connector 31 is connected to the power supply connector 21, and the nozzle connector 32 is connected to the water pipe connector 23. As shown in FIG. 4, the inner end of the mercury lamp body 40 is provided with a second inner end

cover 44. The second power connector 41 and the air intake port 42 are provided on the second inner end cover 44. When mounting the mercury lamp body 40, the second inner end cover 44 is connected to the connector mounting plate 24, such that the second power connector 41 is connected to the power supply connector 21, and the air intake port 42 is connected to the air pipe connector 22.

[0032] As a preferred embodiment, the first inner end cover 34 and the second inner end cover 44 are both provided with a guiding post facing the connector device 20. The connector device 20 is provided with a guiding hole 241 corresponding to the guiding post. Specifically, the guiding post of the first inner end cover 34 is a first guiding post 341, and the guiding post of the second inner end cover 44 is a second guiding post 441. A fitting between the first guiding post 341 and the guiding hole 241 precedes a contact between the first power connector 31 and the power supply connector 21, and a fitting between the second guiding post 441 and the guiding hole 241 precedes a contact between the second power connector 41 and the power supply connector 21. In this way, it can be ensured that when mounting the LED lamp box body 30 or the mercury lamp body 40, the first guiding post 341 or the second guiding post 441 is firstly inserted into the guiding hole 241, which plays a precise positioning function, thus ensuring that preceding inserting the first power connector 31 or the second power connector 41 into the power supply connector 21, the first power connector 31 or the second power connector 41 exactly corresponds to the power supply connector 21, so as to avoid an misalignment in positions of the first power connector 31 or the second power connector 41 and the power supply connector 21 due to a gap between the first sliding rail 33 or the second sliding rail 43 and the guiding rail 11, which misalignment leads to the correct insertion occurs only after multiple plugging and corrections, and causes damage to the power supply connector 21. Further, the first inner end cover 34 and the second inner end cover 44 are both provided with two guiding posts side by side to further improve the guidance of the LED lamp box body 30 and the mercury lamp body 40 when being pushed and inserted into the connector device 20, ensuring smooths connection between the connectors.

[0033] In this embodiment, the power supply connector 21 is a female power supply connector. The first power connector 31 and the second power connector 41 are both male power supply connectors. During mounting, the first power connector 31 or the second power connector 41 is inserted into the power supply connector 21, thereby achieving an electrical connection.

[0034] Preferably, the nozzle connector 32 and the water pipe connector 23 are both self-sealing fast connectors. More preferably, the nozzle connector 32 is a self-sealing fast male connector, and the water pipe connector 23 is a self-sealing fast female connector. As long as the nozzle connector 32 is connected to the water pipe connector 23, water can pass through the water pipe.

Once the nozzle connector 32 is separated from the water pipe connector 23, the nozzle connector 32 and the water pipe connector 23 will each seal the water flow, such that the water cannot flow out, thereby improving the interchange efficiency.

[0035] As a preferred embodiment, outer ends of the LED lamp box body 30 and the mercury lamp body 40 are both provided with handles. The handle of the LED lamp box body 30 is a first handle 35. The handle of the mercury lamp body 40 is a second handle 45. Providing the first handle 35 and the second handle 45 can facilitate the push and pull of the LED lamp box body 30 and the mercury lamp body 40 during the assembly and disassembly process, which improves the convenience.

[0036] It should also be noted that, in the description of the present disclosure, unless otherwise clearly specified and limited, terms "mounted", "connected with", and "connected to" should be understood in a broad sense, for example, it may be a fixed connection or a detachable connection, or integral connection; it may be mechanical connection or electrical connection; it may be direct connection or indirect connection through an intermediate medium, or it may be the internal communication between two elements. For those of ordinary skill in the art, the specific meanings of the above-mentioned terms in the present disclosure can be understood in specific situations.

[0037] In summary, only through one inserting operation towards the connector device, the interchangeable structure of the LED lamp and the mercury lamp of the present disclosure can realize the rapid switching between the LED lamp box and the mercury lamp. The operation is quick and convenient, which is beneficial to simplify the device, improves production efficiency. Therefore, the interchangeable structure of the LED lamp and the mercury lamp has a higher promotion and application value.

[0038] Only preferable implementations of the present disclosure are described above. However, it should be noted that for those of ordinary skill in the art, without departing from the technical principles of the present disclosure, several modifications and replacements can be made, these modifications and replacements all fall within the protection scope of the present disclosure.

Claims

1. An interchangeable structure of a LED lamp and a mercury lamp, comprising:

a base device;
a connector device provided at an end of the base device, the connector device comprising a power supply connector, an air pipe connector, and a water pipe connector; and
a LED lamp box body and a mercury lamp body that are slidably connected to the base device,

respectively;

wherein an inner end of the LED lamp box body is provided with a first power connector corresponding to and matching the power supply connector, and a nozzle connector corresponding to the water pipe connector;

an inner end of the mercury lamp body is provided with a second power connector corresponding to and matching the power supply connector, and an air intake port corresponding to the air pipe connector.

2. The interchangeable structure of the LED lamp and the mercury lamp according to claim 1, wherein the base device comprises opposed guiding rails and a bottom plate connected to the guiding rails, an outer side of the LED lamp box body is provided with a first sliding rail slidably fitted with the guiding rail, an outer side of the mercury lamp body is provided with a second sliding rail slidably fitted with the guiding rail;
the connector device further comprises a connector mounting plate fixedly connected to a first end of the guiding rail, and the power supply connector, the air pipe connector, and the water pipe connector are mounted on the connector mounting plate.
3. The interchangeable structure of the LED lamp and the mercury lamp according to claim 2, wherein both ends of the guiding rail are respectively connected to the bottom plate, a second end of the guiding rail is provided with a plug pin, the first sliding rail and the second sliding rail are each provided with a pin hole matching the plug pin.
4. The interchangeable structure of the LED lamp and the mercury lamp according to claim 1, wherein the inner end of the LED lamp box body is provided with a first inner end cover, the first power connector and the nozzle connector are provided on the first inner end cover;
the inner end of the mercury lamp body is provided with a second inner end cover, the second power connector and the air intake port are provided on the second inner end cover.
5. The interchangeable structure of the LED lamp and the mercury lamp according to claim 4, wherein the first inner end cover and the second inner end cover are both provided with a guiding post facing the connector device, the connector device is provided with a guiding hole corresponding to the guiding post; a fitting between the guiding post and the guiding hole precedes a contact between the first power connector and the power supply connector, and precedes a contact between the second power connector and the power supply connector.

6. The interchangeable structure of the LED lamp and the mercury lamp according to claim 3, wherein the plug pin is an elastic plug pin, during a sliding process of the LED lamp box body and the mercury lamp body towards the connector device, the elastic plug pin is capable of being inserted into the pin hole automatically. 5
7. The interchangeable structure of the LED lamp and the mercury lamp according to any one of claims 1 to 6, wherein the power supply connector is a female power supply connector, the first power connector and the second power connector are male power supply connectors. 10 15
8. The interchangeable structure of the LED lamp and the mercury lamp according to any one of claims 1 to 6, wherein the nozzle connector and the water pipe connector are self-sealing fast connectors. 20
9. The interchangeable structure of the LED lamp and the mercury lamp according to claim 8, wherein the nozzle connector is a self-sealing fast male connector, and the water pipe connector is a self-sealing fast female connector. 25
10. The interchangeable structure of the LED lamp and the mercury lamp according to any one of claims 1 to 6, wherein outer ends of the LED lamp box body and the mercury lamp body are provided with handles. 30

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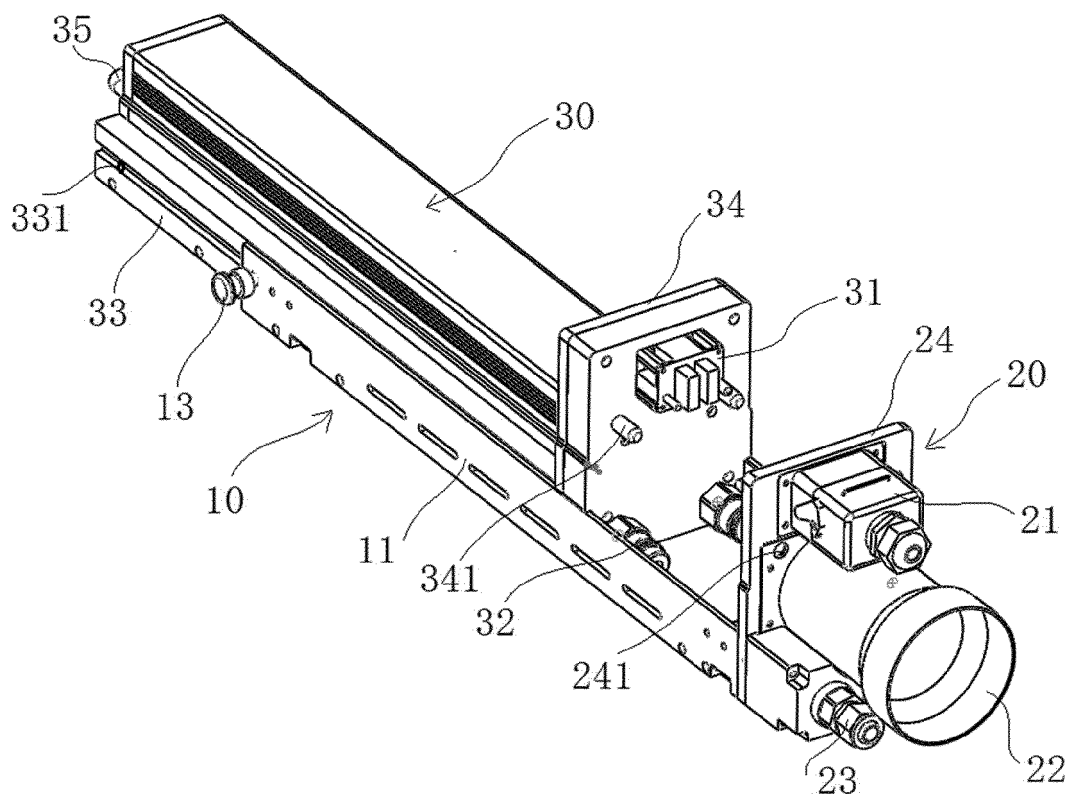


FIG. 1

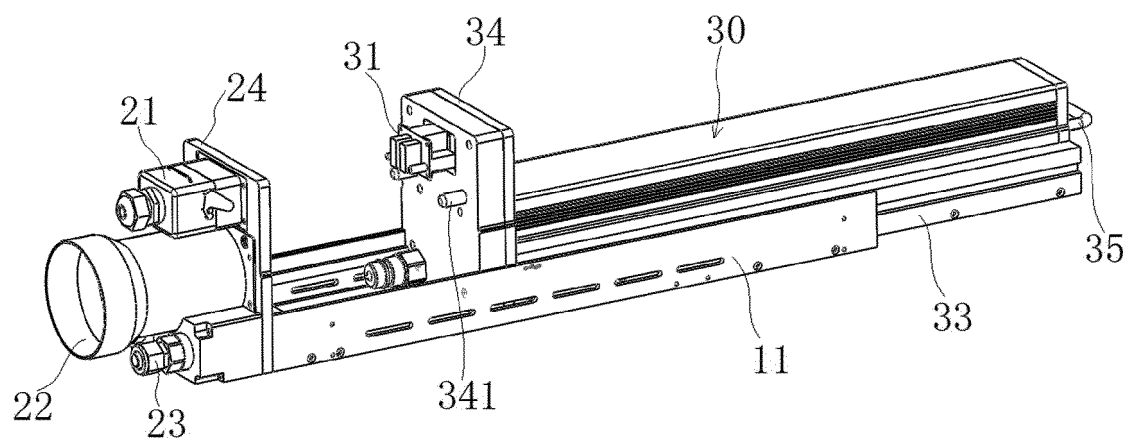


FIG. 2

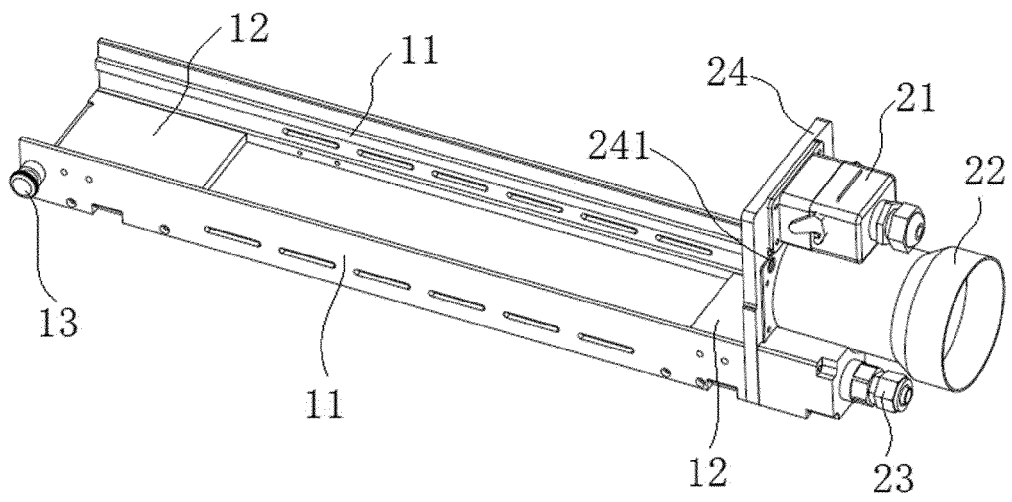


FIG. 3

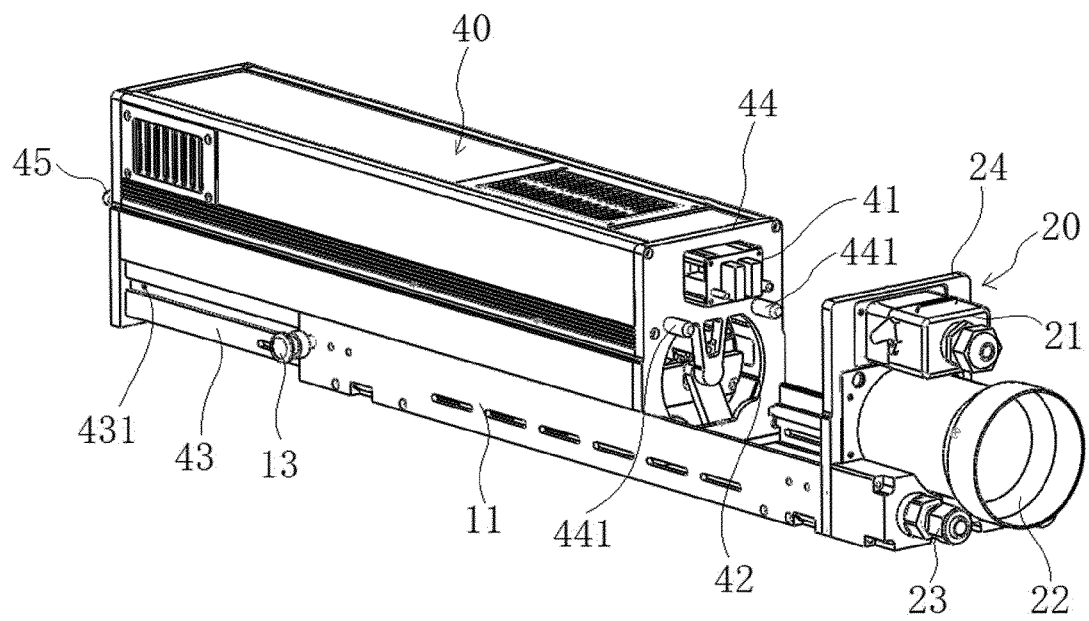


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/110141

A. CLASSIFICATION OF SUBJECT MATTER F21S 8/00(2006.01)i; F21V 19/04(2006.01)i; F21V 23/06(2006.01)i; F21V 29/56(2015.01)i; F21V 29/60(2015.01)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) F21S; F21V Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 109798464 A (LIU, Hua) 24 May 2019 (2019-05-24) description, paragraphs [0006]-[0038], and figures 1-4</td> <td>1-10</td> </tr> <tr> <td>PX</td> <td>CN 209415194 U (GUANGZHOU SUPU SOFTWARE TECHNOLOGY CO., LTD.) 20 September 2019 (2019-09-20) description, paragraphs [0006]-[0038], and figures 1-4</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 205942217 U (GODOX PHOTO EQUIPMENT CO., LTD.) 08 February 2017 (2017-02-08) description, paragraphs [0028]-[0042], and figures 1-7</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 108870346 A (GUANGZHOU SUPU SOFTWARE TECHNOLOGY CO., LTD.) 23 November 2018 (2018-11-23) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 207981577 U (GUANGZHOU JIUHONG INTELLIGENT EQUIPMENT CO., LTD.) 19 October 2018 (2018-10-19) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 109798464 A (LIU, Hua) 24 May 2019 (2019-05-24) description, paragraphs [0006]-[0038], and figures 1-4	1-10	PX	CN 209415194 U (GUANGZHOU SUPU SOFTWARE TECHNOLOGY CO., LTD.) 20 September 2019 (2019-09-20) description, paragraphs [0006]-[0038], and figures 1-4	1-10	A	CN 205942217 U (GODOX PHOTO EQUIPMENT CO., LTD.) 08 February 2017 (2017-02-08) description, paragraphs [0028]-[0042], and figures 1-7	1-10	A	CN 108870346 A (GUANGZHOU SUPU SOFTWARE TECHNOLOGY CO., LTD.) 23 November 2018 (2018-11-23) entire document	1-10	A	CN 207981577 U (GUANGZHOU JIUHONG INTELLIGENT EQUIPMENT CO., LTD.) 19 October 2018 (2018-10-19) entire document	1-10
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																		
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Date of the actual completion of the international search 17 December 2019	Date of mailing of the international search report 06 January 2020																	
Name and mailing address of the ISA/CN China National Intellectual Property Administration No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																	

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/110141

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	CN 105856828 A (SHENZHEN FORECEN TECHNOLOGIES CO., LTD.) 17 August 2016 (2016-08-17) entire document	1-10
A	CN 208407558 U (SHEN ZHEN LED FIELD TECHNOLOGY CO., LTD.) 22 January 2019 (2019-01-22) entire document	1-10
A	CN 206838449 U (JIANGSU GOODLED PRECISION OPTOELECTRONICS CO., LTD.) 05 January 2018 (2018-01-05) entire document	1-10
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Information on patent family members

International application No.

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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 109798464 A	24 May 2019	None	
CN 209415194 U	20 September 2019	None	
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CN 105856828 A	17 August 2016	None	
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