

CLOTHES TREATMENT APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority to Chinese Patent Application No. 202110220997.1 filed on February 26, 2021, the disclosure of which is hereby incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates to the technical field of laundry treatment, and in particular to a laundry treating device.

BACKGROUND

[0003] In the era of rapidly changing consumer demand, users pay more and more attention to the health sterilization function of the products. Taking the dryer as an example, the humid environment in the drum is prone to breed and multiply various bacteria. Once the washing is contaminated with these bacteria, they may cause skin redness, allergy and even urticaria. Therefore, a laundry treating device often has sterilization and antibacterial functions.

[0004] In related technologies, some laundry treating devices use steam sterilization technology, but this kind of sterilization technology has great damage to thin and delicate laundry; and some laundry treating devices use silver-ion sterilization technology, however, silver ion, as a heavy metal ion, led to growing concern about the safety.

SUMMARY

[0005] Therefore, the embodiments of the present invention provide a laundry treating

device with a safe sterilization mode.

[0006] The embodiment of the present invention provides a laundry treating device, including:

[0007] a plasma generator;

[0008] a tub;

[0009] a body on which the tub is rotatably supported, a rear end of the tub is provided with an air inlet, a rear sidewall of the body is provided with a first air opening and a second air opening, and the second air opening is in communication with the air inlet;

[0010] a rear cover disposed at a rear side of the rear sidewall of the body, the rear cover is provided with a flow guiding channel, the flow guiding channel communicates the first air opening with the second air opening, and an electrode of the plasma generator is located in the flow guiding channel of the rear cover.

[0011] In some embodiments, the electrode is extended from an outside of the rear cover into the flow guiding channel.

[0012] In some embodiments, the plasma generator does not extend beyond a rear side surface of the rear cover in a front-rear direction of the laundry treating device.

[0013] In some embodiments, the laundry treating device includes a door disposed at a front side of the body. The door is provided with a light penetrable region, and the electrode of the plasma generator is exposed at the air inlet. A glow generated by the electrode is visible from a front side of the light penetrable region.

[0014] In some embodiments, the plasma generator includes a power cable, a columnar protection housing and the electrode. The electrode and the power cable are accommodated in the columnar protection housing, a part of the columnar protection housing is inserted into the rear cover from a circumferential direction of the rear cover, and the plasma generator is connected with the rear sidewall by the columnar protection housing.

[0015] In some embodiments, the columnar protection housing is provided with a stepped surface in a circumferential direction, and an outer surface of the rear cover abuts against the stepped surface.

[0016] In some embodiments, the columnar protection housing includes an electrode protection housing, a cable protection housing and a sealing member. The electrode is disposed within the electrode protection housing, the power cable is disposed within the cable protection housing, and the sealing member is connected between the electrode protection housing and the cable protection housing. One end of the electrode protection housing adjacent to the sealing member is closed by the sealing member. The rear cover is provided with a mounting hole in which the sealing member is hermetically inserted.

[0017] In some embodiments, the cable protection housing has an open side which faces toward the rear sidewall and is attached to the rear sidewall.

[0018] In some embodiments, a plurality of limiting ribs are provided within the cable protection housing. The plurality of the limiting ribs are spaced apart from each other in an extension direction of the cable protection housing. A top end of one of two adjacent limiting ribs is in contact with the power cable, and a bottom end of the other of the two adjacent limiting ribs is in contact with the power cable.

[0019] In some embodiments, an end of the cable protection housing adjacent to the sealing member is provided with a protrusion extended inwardly. An outer surface of the sealing member intended to cooperate and contact with the cable protection housing is provided with a mounting groove. The sealing member is configured to be snap-fitted into the cable protection housing from the open side of the cable protection housing, to engage the protrusion into the mounting groove.

[0020] In some embodiments, the electrode protection housing is provided with an accommodating cavity for accommodating the electrode. The accommodating cavity has an open side facing toward the air inlet, plasma generated by the electrode is let out only through the open side of the accommodating cavity.

[0021] In some embodiments, one end of the electrode protection housing adjacent to the sealing member is provided with a ledge projecting from a circumferential surface of

the electrode protection housing. The sealing member is provided with a mounting chamber, a corresponding sidewall of the mounting chamber is provided with an annular groove, one end of the electrode protection housing is inserted into the mounting chamber, and the ledge is snap-fitted into the annular groove.

[0022] In some embodiments, the rear cover comprises a flank portion and a flat bottom portion. The flank portion is disposed around an edge of the flat bottom portion and protrudes from a side of the flat bottom portion toward the body. The flank portion and the flat bottom portion together define the flow guiding channel. The flank portion is hermetically attached to an outer surface of the rear sidewall, and the plasma generator is disposed on the flank portion.

[0023] The plasma generating device in the laundry treating device of the embodiments of the present invention ionizes the air (for example, the oxygen and water molecules in the air) through the high voltage electricity to generate a large number of strong oxidizing substances such as active ions and high-energy free radicals. These strong oxidizing substances can destroy the molecular protein structure of the pathogens, thereby achieving sterilization and disinfection effects. In addition, the strong oxidizing properties of the strong oxidizing substances may oxidize and decompose the molecules with peculiar smell, thereby eliminating peculiar smell. In addition, an electrode of the plasma generator is located in the flow guiding channel. The plasma generated by ionization can quickly enter into the tub along with the drying airflow in the flow guiding channel and then is diffused in the tub, thereby improving the sterilization and deodorization efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a schematic view of a laundry treating device in an embodiment of the present invention.

[0025] FIG. 2 is a right side view of FIG. 1.

[0026] FIG. 3 is an enlarged partial schematic view of area A in FIG. 2.

[0027] FIG. 4 is a schematic view of the structure shown in FIG. 2, in which a rear cover is omitted.

[0028] FIG. 5 is a schematic view of the structure shown in FIG. 4, in which a tub is omitted.

[0029] FIG. 6 is a rear view of a plasma generator and the rear cover of FIG. 2.

[0030] FIG. 7 is a schematic view of a plasma generator in an embodiment of the present invention.

[0031] FIG. 8 is a schematic view of a cable protection housing and a power cable of FIG. 7.

[0032] FIG. 9 is a schematic view of the structure shown in FIG. 8 seen from another perspective.

[0033] FIG. 10 is a cross-sectional view along a B-B direction of FIG. 8.

[0034] FIG. 11 is a schematic view of a sealing member in an embodiment of the present invention.

[0035] FIG. 12 is a schematic view of an electrode protection housing in an embodiment of the present invention.

[0036] Fig. 13 is a schematic view of a plasma generator, a rear cover and a rear sidewall in another embodiment of the present invention.

[0037] FIG. 14 is a schematic view of a plasma generator, a rear cover and a rear sidewall in yet another embodiment of the present invention.

DETAILED DESCRIPTION

[0038] The technical solutions in the embodiments of the present invention will be clearly and completely described below with reference to the accompany drawings. It is

apparent that the embodiments described are part of but not all of the embodiments of the present invention. Based on the embodiments in the present invention, all other embodiments obtained without creative effort by those of ordinary skill in the art will fall within the scope of protection of the present invention.

[0039] In descriptions of the application, the orientation or positional relationships “anterior”, “posterior”, “front-rear direction” are based on the orientation or positional relationships shown in FIG. 1, and the orientation or positional relationships “top”, “bottom”, “height direction” are based on the orientation or positional relationships shown in FIG. 2. It should be noted that, these orientation terms are merely intended to facilitate the descriptions of the application and simplify the descriptions, and are not intended to indicate or imply that an apparatus or element involved must have a particular orientation or must be constructed and operate in a particular orientation, and thus cannot be understood as limitation to the application. Furthermore, the terms “first” and “second” are used for descriptive purposes only and cannot be understood as indicating or implying relative importance.

[0040] In addition, the technical features involved in different embodiments of the present invention described below may be combined with each other as long as they do not conflict with each other.

[0041] The embodiments of the present invention provide a laundry treating device, with reference to FIGS. 1 to 6, the laundry treating device includes a plasma generator 10, a tub 40, a body 30 and a rear cover 20. A rear end of the tub 40 is rotatably supported on a rear sidewall 31 of the body 30, specifically, the tub 40 is rotatably supported on the rear sidewall 31 of the body 30 by a rotating shaft. That is to say, the rear sidewall 31 of the body 30 carries part of the weight of the tub 40. The rear end of the tub 40 is provided with an air inlet 40a, the rear sidewall 31 of the body 30 is provided with a first air opening 30a and a second air opening 30b. The second air opening 30b is in communication with the air inlet 40a. The rear cover 20 is disposed at a rear side of the rear sidewall 31 of the body 30, and the rear cover 20 has a flow guiding channel 20a. The flow guiding channel 20a communicates the first air opening 30a with the second air opening 30b. In the laundry treating device of the embodiments of the

present invention, the plasma generating device 10 ionizes the air (for example, the oxygen and water molecules in the air) through the high voltage electricity to generate a large number of strong oxidizing substances such as active ions and high-energy free radicals. These strong oxidizing substances can destroy the molecular protein structure of the pathogens, thereby achieving sterilization and disinfection effects. In addition, the strong oxidizing properties of the strong oxidizing substances may oxidize and decompose the molecules with peculiar smell, thereby eliminating peculiar smell.

[0042] In addition, an electrode 12 of the plasma generator 10 is located in the flow guiding channel 20a. The plasma generated by ionization can quickly enter into the tub 40 along with the drying airflow in the flow guiding channel 20a and then is diffused in the tub, thereby improving the sterilization and deodorization efficiency.

[0043] In some embodiments, with reference to FIG. 1 and FIG. 2, the electrode 12 is extended from an outside of the rear cover 20 into the flow guiding channel 20a. Since the electrode 12 of the plasma generator 10 is extended from the outside of the rear cover 20 into the flow guiding channel 20a of the rear cover 20, it is convenient to assemble the plasma generator 10 from the outside of the rear cover 20, thereby having a large assembly space. As such, there is no need to change the structural design of the body 30. Since the plasma generator 10 is disposed on the rear cover 20 and the plasma generator 10 is located at the rear part of the laundry treating device in the front-rear direction, the plasma generator 10 will not affect the aesthetic of the appearance of the laundry treating device.

[0044] In some embodiments, with reference to FIG. 1 and FIG. 2, the plasma generator 10 does not extend beyond the rear side surface of the rear cover 20 in the front-rear direction of the laundry treating device, thereby preventing the plasma generator 10 from protruding from the rear part of the laundry treating device in the front-rear direction. On the one hand, it is possible to avoid increasing the length dimension of the whole machine in the front-rear direction. On the other hand, the rear cover 20 may protect the plasma generator 10, thereby reducing risk of an external object colliding with the plasma generator 10.

[0045] It may be understood that, a laundry treating chamber (not shown) is provided

in the tub 40. The front side of the tub 40 has an opening, and a laundry access opening is provided at the front part of the body 30, such that a user may pick/drop the laundry from/into the tub through the laundry access opening. The laundry treating device includes a door 32 disposed on the front side of the body 30, and the door 32 is rotatably connected with the body 30 to selectively open or close the laundry access opening. When the laundry access opening is closed by the door 32, an interior of the body 30 is in a relatively closed state.

[0046] It may be understood that, the laundry treating device has a circulating air duct, the flow guiding channel 20a and the laundry treating chamber described above are located on the circulating air duct, and the air flow circulates in the circulating air duct. It should be noted that, a dehumidifier (not shown) and a heater (not shown) are arranged upstream of the circulating air duct.

[0047] The working process and drying principle of the laundry treating device of the embodiments of the present invention are as follows: the hot drying air flow in the circulating air duct flows through the first air opening 30a, the flow guiding channel 20a, the second air opening 30b and the air inlet 40a and then enters into the laundry treating chamber; in the laundry treating chamber, the dry and hot air flow flows through the surface of the wet laundry, carries out the heat and moisture exchange with the wet laundry, absorbs the water in the laundry and becomes wet and hot air flow; the wet and hot air flow enters the upstream of the circulating air duct and then flows through the dehumidifier and the heater in sequence; the wet and hot air flow is condensed and dehumidified by the dehumidifier to become a low-temperature dry air flow during flowing through the dehumidifier, and the low-temperature dry air flow is then heated and becomes dry and hot air flow when flowing through the heater. The dry and hot air flow enters the flow guiding channel 20a again from the first air opening 30a, and enters the laundry treating chamber again from the air inlet 40a. This cycle repeats itself, and thus realizing continuous and efficient drying of the laundry.

[0048] The specific types of the dehumidifiers are not limited, which may be an evaporator of a heat pump system, or may be the water cooler. The specific types of the heaters are not limited, for example, which may be a resistance wire, a Positive

Temperature Coefficient (PTC), a condenser of the heat pump system, etc.

[0049] In some embodiments, the door 32 has a light penetrable region (not shown). With reference to FIG. 1 and FIG. 4, the electrode 12 of the plasma generator 10 is exposed at the air inlet 40a, such that the glow generated by the electrode 12 is visible from the front side of the light penetrable region in the front-rear direction. When the laundry treating device is in operation, the user may observe the working condition of the plasma generator 10 at any time, so as to directly determine whether the sterilization and disinfection function of the laundry treating device is currently activated by observing the glow of the electrode 12. As such, the laundry treating device provided a better visualization effect, and improves the user experience feeling.

[0050] In some embodiments, with reference to FIG. 7, the plasma generator 10 includes a power cable 13, the electrode 12 and a columnar protection housing 11 in which the electrode 12 and the power cable 13 are accommodated.

[0051] The power cable 13 supplies high-voltage electricity to the electrode 12, causing the electrode 12 to undergo a high voltage discharge to generate the plasma. The columnar protection housing 11 provides protection effect on the electrode 12 and power cable 13. On the one hand, the columnar protection housing protects the electrode 12 and the power cable 13 from direct contact with external objects, thereby avoiding damage to the electrode 12 and the power cable 13 due to collision or friction. On the other hand, the columnar protection housing protects the user from directly contact with the electrified electrode 12 and the power cable 13, thereby improving the safety of the laundry treating device.

[0052] A part of the columnar protection housing 11 is inserted into the rear cover 20 from the periphery of the rear cover 20, and the plasma generator 10 is connected with the rear sidewall 31 by the columnar protection housing 11. The inserting position of the columnar protection housing 11 is located on the periphery of the rear cover 20, such that the plasma generator 10 may be arranged along the surface of the body 30 without affecting the length dimension of the body 30 in the front-rear direction, thereby preventing the plasma generator 10 from protruding from the rear side surface of the rear cover 20 in the front-rear direction, and improving the adaptability of the laundry treating

device.

[0053] The shape of the columnar protection housing 11 is not limited, as long as it is prone to be inserted into the rear cover 20 and would not block the glow of the electrode 12.

[0054] For example, in some embodiments, with reference to FIG. 13, the columnar protection housing 11 is generally in the shape of a straight rod. The length of a portion of the power cable 13 lead out from a power cable outlet (not shown) on the rear side wall 31 to the inserting position where the power cable is inserted into the rear cover 20 is relatively short, thereby saving materials and reducing electromagnetic interference of the power cable 30 to the surrounding electrical components. Accordingly, the overall dimension of the plasma generator 10 is reduced, the shape is simple and convenient to manufacture, and thus reducing the production cost.

[0055] For example, in some other embodiments, with reference to FIGS. 2 to 9, the columnar protection housing 11 is generally in the shape of a bent rod, for example, generally in the shape of an L.

[0056] In some embodiments, the columnar protection housing 11 is located at the upper end of the rear cover 20. On the one hand, the periphery of the rear cover 20 has a larger mounting space at the upper end, and thus facilitating the arrangement of the columnar protection housing 11. On the other hand, the columnar protection housing 11 is located as adjacent to the power cable outlet as possible to reduce the length of the power cable 30.

[0057] It should be understood that, an auxiliary position limiting structure may be provided on the columnar protection housing 11 or the rear cover 20 to limit the inserting depth of the columnar protection housing 11. As such, it is convenient for positioning the columnar protection housing 11 during the assembly process and improves the assembly efficiency.

[0058] It should be understood that, the form of the auxiliary position limiting structure is not limited. For example, in some embodiments, a threaded hole is provided on the rear cover 20, and a circumferential outer surface of the columnar protection

housing 11 is provided with an external thread cooperating with the threaded hole on the rear cover 20, and then the inserting depth can be controlled by the number of turns of screwing the external thread.

[0059] In some other embodiments, with reference to FIG. 3 and FIG. 7, the columnar protection housing 11 is provided with a stepped surface 11a in the circumferential direction, and the outer surface of the rear cover 20 abuts against the stepped surface 11a. During assembly, the columnar protection housing 11 may be quickly inserted into the rear cover 20 from outside until the stepped surface 11a abuts against the outer surface of the rear cover 20, at which time the electrode 12 is at the inserting depth required by the design. In this way, the plasma generator 10 may be positioned quickly, and the consistency of mass products may be improved. Moreover, the stepped surface 11a has a simple structure, which is easy to manufacture and convenient to operate.

[0060] It should be understood that, in some embodiments, the columnar protection housing 11 may be manufactured in one piece, thereby simplifying the assembly processes of the plasma generator 10 and improving the structural strength.

[0061] In some other embodiments, the columnar protection housing 11 may also be composed of several different parts. As such, it is possible to reduce the manufacturing difficulty of the columnar protection housing 11, and thus reducing the production cost. On the other hand, different parts may be adapted with the electrode 12 and the power cable 13 respectively, so as to improve the protection effect on the electrode 12 and the power cable 13.

[0062] For example, in some embodiments, with reference to FIG. 7, the columnar protection housing 11 includes an electrode protection housing 113 in which the electrode 12 is disposed, a cable protection housing 111 in which the power cable 13 is disposed, and a sealing member 112. It should be noted that, the electrode protection housing 113, the cable protection housing 111 and the sealing member 112 are independent from each other.

[0063] The electrode protection housing 113 is configured to protect the electrode 12, and the cable protection housing 111 is configured to protect the power cable 13, that is,

the functions of the two protection housings are independent from each other. If either of the two protection housings is damaged, only the damaged components need to be replaced without replacing both of the housings. Thus the use and maintenance cost in the later period can be reduced. Moreover, the electrode protection housing 113 and the cable protection housing 111 may be individually optimized according to the wiring condition of the power cable 13 and the appearance of the electrode 12, so as to allow a targeted improvement on the protection effect.

[0064] The sealing member 112 is connected between the electrode protection housing 113 and the cable protection housing 111, and closes one end of the electrode protection housing 113 adjacent to the sealing member 112, that is, the electrode protection housing 113 and the cable protection housing 111 are connected to each other by the sealing member 112.

[0065] The rear cover 20 is provided with a mounting hole (not shown), and the sealing member 112 is hermetically inserted in the mounting hole. The sealing member 112 may seal the mounting hole, so as to prevent the airflow and plasma in the flow guiding channel 20a from escaping from the mounting hole. In this way, the air tightness of the flow guiding channel 20a can be ensured, and the sterilization and deodorization efficiency of the laundry treating device can be improved.

[0066] The electrode protection housing 113 and the cable protection housing 111 may be made in one piece by injection molding, or may be made by splicing a plurality of plates.

[0067] It should be understood that, in order to prevent injury to the user caused by electric leakage occurred at the power cable 13 and the electrode 12, the electrode protection housing 113 and the cable protection housing 111 are electrical insulation, for example, are made of a plastic material.

[0068] The sealing member 112 may be made of an elastic material such as rubber or silicone. On the one hand, the sealing member 112 made of the elastic material is deformable, to facilitate the insertion of the sealing member 112 into the mounting hole in the rear cover 20. On the other hand, the elastic material may recovery after the

insertion of the sealing member 112, so as to occupy the space in the mounting hole and improve the sealing performance.

[0069] It should be understood that, the structure of the electrode protection housing 113 or the cable protection housing 111 may be simplified by the structure of the rear sidewall 31 or the rear cover 20 itself, thereby reducing the material and manufacturing cost and facilitating maintenance.

[0070] For example, in some embodiments, with reference to FIG. 2, FIG. 6 and FIG. 8, the cable protection housing 111 has an open side which faces toward the rear sidewall 31 and is attached to the rear sidewall 31. The cable protection housing 111 and the rear sidewall 31 define a protection chamber for protecting the power cable 13 therein. The structure of the cable protection housing 111 facilitates the injection molding, thereby reducing the cost of the mold and the raw material. In addition, after the cable protection housing 111 is removed from the rear sidewall 31, the condition of the internal power cable 13 may be directly observed through the open side, which is convenient for the maintenance and improves the user experience. Furthermore, the configuration in which one side of the cable protection housing 111 is opened reduces the length and dimension of the cable protection housing 111 in the front-rear direction of the laundry treating device. As such, the requirement that the plasma generator 10 does not exceed the rear side surface of the rear cover 20 can be satisfied, and the cable protection housing 111 can stably abut against the surface of the rear sidewall 31 of the body 30.

[0071] It should be understood that, in order to facilitate the connection of the cable protection housing 111 with the rear side plate 31, in some embodiments, a through hole may be provided on the cable protection housing 111, and a threaded hole may be provided on the rear sidewall 31. A screw passes through the through hole and is screwed into the threaded hole, so as to fix the cable protection housing 111. In another example, an elastic snap member 1113 is provided on the cable protection housing 111, and a snap attachment hole is provided on the rear sidewall 31. A front end of the elastic snap member 1113 is provided with a barb. The barb may extend into the snap attachment hole and abut against the inner wall of the rear sidewall 31, to allow the rapid connection between the rear sidewall 31 and the cable protection housing 111. Therefore, assembly

time can be reduced and assembly efficiency can be improved.

[0072] It should be understood that, in some embodiments, only the through hole is provided on the cable protection housing 111, and no elastic snap member 1113 is provided. In another embodiment, only the elastic snap member 1113 is provided on the cable protection housing 111, and no through hole is provided. In still another embodiment, both of the elastic snap member 1113 and the through hole are provided on the cable protection housing 111.

[0073] By way of example, in some embodiments, with reference to FIG. 8, a through hole (not shown) and a plurality of elastic snap members 1113 spaced apart from each other are provided at an edge of the cable protection housing 111. When installing the cable protection housing 111, the plurality of elastic snap members 1113 are snap-fitted into the snap attachment hole (not shown) on the rear sidewall 31 to abut against the inner surface of the rear sidewall 31, and the screw is then passed through the through hole to cooperate with the thread (not shown) on the rear sidewall 31, so as to realize the mounting and positioning of the cable protection housing 111. The snap-fastening of the elastic snap member 1113 is quick and convenient, which may reduce the assembly time.

[0074] In some embodiments, with reference to FIG. 8 and FIG. 10, a plurality of limiting ribs 1111 are provided within the cable protection housing 111, and the plurality of limiting ribs 1111 are spaced apart from each other in the extension direction of the cable protection housing 111. A top end of one of two adjacent limiting ribs 1111 is in contact with the power cable 13, and a bottom end of the other limiting rib is in contact with the power cable 13. The cooperation of each limiting rib 1111 and the power cable 13 is beneficial to the standardized arrangement of the wiring of the power cable 13 in the production process, thereby preventing the power cable 13 from being piled up and squeezed in the cable protection housing 111 in disorder, and facilitating subsequent maintenance. The power cable 13 is arranged circuitously in the cable protection housing 111, the power cable 13 is subjected to two opposite forces in the height direction, so as to prevent the power cable 13 from arching or sinking due to the force in only one direction. The limiting rib 1111 plays a positioning role for the power cable 13. Since the two adjacent limiting ribs 1111 limit the position of the power cable 13 by contacting the

power cable at the top and bottom ends respectively, the power cable 13 is positioned along a median line of the cable protection housing 111, such that the friction risk between the power cable 13 and the cable protection housing 111 is further reduced.

[0075] By way of example, the limiting rib 1111 is provided with a limiting groove 1111a in which the power cable 13 is engaged. That is, for the two adjacent limiting ribs 1111, the limiting groove 1111a of one limiting rib 1111 is located at the top end, and the limiting groove 1111a of the other limiting rib 1111 is located at the bottom end.

[0076] The power cable 13 may be snap-fitted into the limiting groove 1111a, thereby preventing the power cable 13 from slipping on the limiting rib 1111. Thus, the friction between the power cable 13 and the limiting rib 1111 can be reduced while the power cable 13 is held in position.

[0077] In some embodiments, with reference to FIG. 9, a process hole 1111b is provided on the cable protection housing 111. The process hole 1111b passes through the cable protection housing 111 and is located behind the limiting rib 1111. The process hole 1111b facilitates demoulding during the injection molding for manufacturing the limiting rib 1111, thereby improving the production efficiency.

[0078] In some embodiments, with reference to FIG. 7, FIG. 8 and FIG. 11, an end of the cable protection housing 111 adjacent to the sealing member 112 is provided with a protrusion 1112 extended inwardly, and an outer surface of the sealing member 112 intended to cooperate and contact with the cable protection housing 111 is provided with a mounting groove 112a. The sealing member 112 may be snap-fitted into the cable protection housing 111 from the open side of the cable protection housing 111, to engage the protrusion 1112 into the mounting groove 112a. Since the protrusion 1112 is engaged in the mounting groove 112a. The firm connection between the sealing member 112 and the cable protection housing 111 is ensured. In addition, during insertion/extraction of the plasma generator 10 into/from the mounting hole, the snap-fitted direction between the mounting groove 112a and the protrusion 1112 is different from the inserting and extracting direction of the plasma generator 10, and therefore, it is possible to reduce the risk that the sealing member 112 and the cable protection housing 111 are separated from each other during insertion and extraction of the plasma generator 10.

[0079] It should be noted that, the snap-fitted direction between the mounting groove 112a and the protrusion 1112 and the inserting and extracting direction of the plasma generator 10 may be at any appropriate angle, as long as the two directions are not parallel to each other.

[0080] By way of example, with reference to FIG. 7, the inserting and extracting direction of the plasma generator 10 is perpendicular to the snap-fitted direction between the sealing member 112 and the cable protection housing 111, which increases the acting force between the protrusion 1112 and the mounting groove 112a, and further improves the connection stability between the protrusion 1112 and the mounting groove 112a during the insertion and extraction of the plasma generator 10.

[0081] In order to increase the diffusion rate of the plasma, in some embodiments, a plurality of through meshes (not shown) may be provided on the electrode protection housing 113. The airflow may enter into the electrode protection housing 113 through the meshes and then contact with the electrode 12, to bring the plasma into the tub 40 and accelerate the diffusion of the plasma.

[0082] It may be understood that, the mesh may be provided on a side of the electrode protection housing 113 facing the airflow to facilitate the inflow of the airflow.

[0083] Flocks are easily generated during the drying process of the laundry, and the flocks are carried by the airflow to flow in the circulating channel. In some embodiments, at least a portion of the electrode protection housing 113 is capable of blocking the airflow in the flow guiding channel 20a blowing onto the electrode 12, thereby preventing the flocks from winding on the electrode 12, and avoiding the flocks affecting the discharge of the electrode 12 to ensure the efficiency of plasma generation. On the other hand, the current generated by the electrode 12 is prevented from melting or burning the flocks, and thus the service life of the electrode 12 will not be reduced due to the melting or burning of the flocks, and the potential safety hazard caused by the damage of the electrode 12 therefrom is prevented.

[0084] On the premise of not affecting the user's observation of the glow generated by the electrode 12, all surfaces on the electrode 12 that are blown by the airflow in the flow

guiding channel 20a may be covered by the electrode protection housing 113, or only the surfaces of the electrode 12 that are directly blown by the airflow in the flow guiding channel 20a are mainly covered.

[0085] For example, in some embodiments, with reference to FIG. 12, the electrode protection housing 113 is provided with an accommodating cavity 113a for accommodating the electrode 12. The accommodating cavity 113a has an open side facing toward the air inlet 40a, and the plasma generated by the electrode 12 is let out only through the open side of the accommodating cavity 113a. On the one hand, the side of the electrode 12 facing the airflow is covered by the electrode protection housing 113, so as to prevent the flocks from adhering to the electrode 12 with the airflow in the flow guiding channel 20a. On the other hand, the glow generated by the discharge of the electrode 12 may only be emitted from the open side, which is convenient for a user to observe the glow.

[0086] The specific structure and shape of the electrode protection housing 113 are not limited. By way of example, in some embodiments, with reference to FIG. 12, the electrode protection housing 113 includes an electrode protection housing back plate 1133, an electrode protection housing bottom plates 1134 and two electrode protection housing side plates 1132, in which the electrode protection housing back plate 1133, the electrode protection housing bottom plate 1134 and the electrode protection housing side plate 1132 together surround to form the accommodating cavity 113a. And the electrode protection housing back plate 1133 is located behind the electrode 12, the two electrode protection housing side plates 1132 are disposed at the front side of the protection housing back plate 1133 and are located at opposite ends of the protection housing back plate 1133 on the left and right sides, and the electrode protection housing bottom plate 1134 are located at one end of the electrode 12 away from the sealing member 112. The electrode protection housing back plate 1133, the electrode protection housing bottom plate 1134 and the electrode protection housing side plates 1132 isolate the windward side of the electrode 12 from the flow guiding channel 20a, thereby preventing impurities such as flocks from blowing directly to the electrode 12.

[0087] It should be understood that, since the electrode 12 will be discharged, the

electrode protection housing back plate 1133, the electrode protection housing bottom plate 1134 and the electrode protection housing side plates 1132 should be spaced from the electrode 12 by a certain distance to avoid direct contact with the electrode 12.

[0088] In some embodiments, with reference to FIG. 12, one end of the electrode protection housing 113 adjacent to the sealing member 112 is provided with a ledge 1131 projecting from the circumferential surface of the electrode protection housing 113, the sealing member 112 is provided with a mounting chamber (not shown), and a corresponding sidewall of the mounting chamber is provided with an annular groove (not shown). One end of the electrode protection housing 113 is inserted into the mounting chamber and the ledge 1131 is snap-fitted into the annular groove.

[0089] During the insertion of the electrode protection housing 113 into the mounting chamber of the sealing member 112, the electrode protection housing 113 forces the sealing member 112 to undergo elastic deformation, thereby facilitating the smooth insertion of the electrode protection housing 113 into the mounting chamber. The ledge 1131 abuts against the annular groove, and the annular groove exerts a force opposite to the disengagement direction on the ledge 1131, thereby reducing the risk of the disengagement of the electrode protection housing 113.

[0090] The specific structure of the rear cover 20 is not limited, so long as the airflow may be guided from the first air opening 30a to the second air opening 30b.

[0091] By way of example, in some embodiments, with reference to FIG. 6, the rear cover 20 includes a flank portion 21 and a flat bottom portion 22. The flank portion 21 is disposed around an edge of the flat bottom portion 22 and protrudes from a side of the flat bottom portion 22 facing the body 30. The flank portion 21 and the flat bottom portion 22 together define the flow guiding channel 20a. The flank portion 21 is hermetically attached to an outer surface of the rear sidewall 31, and the plasma generator 10 is disposed on the flank portion 21. For easy machining, the flat bottom portion 22 is in the shape of a flat plate. The open side of the rear cover 20 is closed by the rear sidewall 31, thereby reducing the structural weight of the rear cover 20, facilitating assembly and saving materials. The plasma generator 10 is located on the flank portion 21, such that the plasma generator 10 will not protrude beyond the rear

surface of the flat bottom portion 22 in the front-rear direction, thereby avoiding increasing the length dimension of the laundry treating device in the front-rear direction.

[0092] It should be noted that, in the embodiment of the present invention, the rear side surface of the rear cover 20 is the rear surface of the flat bottom portion 22.

[0093] In some embodiments, with reference to FIG. 5, the rear sidewall 31 includes a back plate 312 and a balancing frame 311. The back plate 312 is provided with a through hole (not shown) at a position corresponding to the rear end of the tub 40, and the balancing frame 311 is arranged in the through hole. A bearing hole 311a is provided at an intermediate position of the balancing frame 311, and a rotating shaft (not shown in the figure) is provided in the laundry treating device. The rotating shaft is rotatable and passes through the bearing hole 311a. The tub 40 is rotatably supported on the balancing frame 311 by the rotating shaft. A hollow region of the balancing frame 311 forms the second air opening 30b.

[0094] It should be noted that, the electrode 12 of the plasma generator 10 is unobstructed by the balancing frame 311.

[0095] For example, in some embodiments, with reference to FIG. 2 and FIG. 14, the plasma generator 10 may be in a bended shape, for example, an L-shape, a straight rod shape, or the like, such that the electrode 12 does not interfere with the projection range of the balancing frame 311 in the front-rear direction, thereby facilitating the user to observe the glow.

[0096] It is apparent that the above embodiments of the present invention are merely examples for clarity of illustration and are not limited to the embodiments. Other variations or alterations in different forms may be made on the basis of the above description for those of ordinary skill in the art. It is unnecessary and impossible to enumerate all implementations here. The obvious variations or alterations resulting therefrom are still within the scope of protection created by the present invention.

CLAIMS

1. A laundry treating device, comprising:

a plasma generator;

a tub;

a body on which the tub is rotatably supported, a rear end of the tub being provided with an air inlet, a rear sidewall of the body being provided with a first air opening and a second air opening, the second air opening being in communication with the air inlet; and

a rear cover disposed on a rear side of the rear sidewall of the body, the rear cover being provided with a flow guiding channel communicating the first air opening with the second air opening, an electrode of the plasma generator being located in the flow guiding channel of the rear cover.

2. The laundry treating device according to claim 1, wherein the electrode is extended from an outside of the rear cover into the flow guiding channel.

3. The laundry treating device according to claim 1, wherein the plasma generator does not extend beyond a rear side surface of the rear cover in a front-rear direction of the laundry treating device.

4. The laundry treating device according to claim 1, wherein the laundry treating device comprises a door disposed at a front side of the body, the door being provided with a light penetrable region, the electrode of the plasma generator being exposed at the air inlet, a glow generated by the electrode being visible from a front side of the light penetrable region.

5. The laundry treating device according to claim 1, wherein the plasma generator comprises a power cable, a columnar protection housing and the electrode, the electrode and the power cable being accommodated in the columnar protection housing, a part of the columnar protection housing being inserted into the rear cover from a periphery of the rear cover, the plasma generator being connected with the rear sidewall by the columnar protection housing.

6. The laundry treating device according to claim 5, wherein the columnar protection housing is provided with a stepped surface in a circumferential direction, an outer surface of the rear cover abutting against the stepped surface.

7. The laundry treating device according to claim 5, wherein the columnar protection housing comprises an electrode protection housing, a cable protection housing and a sealing member, the electrode being disposed within the electrode protection housing, the power cable being disposed within the cable protection housing, the sealing member being connected between the electrode protection housing and the cable protection housing, one end of the electrode protection housing adjacent to the sealing member being closed by the sealing member, the rear cover being provided with a mounting hole in which the sealing member is hermetically inserted.

8. The laundry treating device according to claim 7, wherein the cable protection housing has an open side which faces toward the rear sidewall and is attached to the rear sidewall.

9. The laundry treating device according to claim 7, wherein a plurality of limiting ribs are provided within the cable protection housing, the plurality of the limiting ribs being spaced apart from each other in an extension direction of the cable protection housing, a top end of

one of two adjacent limiting ribs being in contact with the power cable, and a bottom end of the other of the two adjacent limiting ribs being in contact with the power cable.

10. The laundry treating device according to claim 7, wherein an end of the cable protection housing adjacent to the sealing member is provided with a protrusion extended inwardly, an outer surface of the sealing member intended to cooperate and contact with the cable protection housing being provided with a mounting groove, the sealing member is configured to be snap-fitted into the cable protection housing from the open side of the cable protection housing, to engage the protrusion into the mounting groove.

11. The laundry treating device according to claim 7, wherein the electrode protection housing is provided with an accommodating cavity for accommodating the electrode, the accommodating cavity having an open side facing toward the air inlet, plasma generated by the electrode being let out only through the open side of the accommodating cavity.

12. The laundry treating device according to claim 7, wherein one end of the electrode protection housing adjacent to the sealing member is provided with a ledge projecting from a circumferential surface of the electrode protection housing, the sealing member being provided with a mounting chamber, a corresponding sidewall of the mounting chamber being provided with an annular groove, one end of the electrode protection housing being inserted into the mounting chamber, and the ledge being snap-fitted into the annular groove.

13. The laundry treating device according to claim 1, wherein the rear cover comprises a flank portion and a flat bottom portion, the flank portion being disposed around an edge of the flat bottom portion and protruding from a side of the flat bottom portion toward the body, the flank portion and the flat bottom portion together defining the flow guiding channel, the flank

portion being hermetically attached to an outer surface of the rear sidewall, the plasma generator being disposed on the flank portion.