(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 985 316 A1**

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

(43) Date of publication:
20.04.2022 Bulletin 2022/16

(21) Application number: **19932895.6**

(22) Date of filing: **21.11.2019**

(51) International Patent Classification (IPC):
F24F 3/16 *(2021.01)* ***F24F 13/28*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
F24C 15/20; F24F 3/16; F24F 13/28

(86) International application number:
PCT/CN2019/120026

(87) International publication number:
WO 2020/248521 (17.12.2020 Gazette 2020/51)

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **12.06.2019 CN 201910506447**

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(54) PURIFIER AND AIR PURIFICATION APPLIANCE

(57) Disclosed are a purifier and an extractor hood. The purifier includes a shell and a purification assembly. A receiving space is formed in the house, and the purification assembly is arranged in the receiving space. The purification assembly includes a support part, a coil assembly, a grille part and a power supply assembly. The coil assembly is arranged on one side of the support part, and the grille part is connected to the support part. The grille part and the support part form a mounting chamber in which an activated carbon element is placed. The power supply assembly is arranged on one side of the support part facing away from the coil assembly, and the power supply assembly is electrically connected to the coil assembly. The extractor hood includes the purifier and a fan connected to the purifier. The fan is configured for the suction of gas and discharging the gas into the purifier, and a second plug of the purifier is connected to the fan. Through the arrangement of the purification assembly, the purifier can purify oil fumes to make the gas discharged from the purifier cleaner. The purification assembly is arranged in the receiving space of the shell, so that the structure of the purifier is simple and the production of the miniaturized purifier is facilitated.

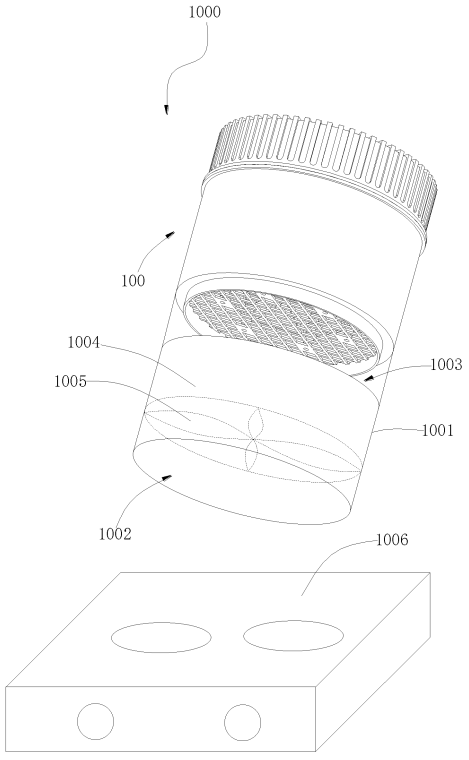

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of extractor hoods, and in particular to a purifier and an extractor hood.

BACKGROUND

[0002] Oil fume purifiers can purify oil fumes, so as to purify harmful substances from the oil fumes. For example, PM2.5, benzene, bacteria and other substances in the oil fumes can be purified by the oil fume purifiers to make the gas discharged from the oil fume purifiers cleaner and safer. However, the existing oil fume purifiers are complicated in structure and large in size, so it is inconvenient to place and use the oil fume purifiers, degrading the user experience.

SUMMARY

[0003] The present invention aims to solve at least one of the technical problems existing in the prior art. In view of this, the present invention provides a purifier and an extractor hood.

[0004] An embodiment of the present invention provides a purifier, including:

a shell in which a receiving space is formed;
a purification assembly arranged in the receiving space, the purification assembly comprising:

a support part;
a coil assembly arranged on one side of the support part;
a grille part connected to the support part, where the grille part and the support part form a mounting chamber in which an activated carbon element is placed; and

a power supply assembly arranged on one side of the support part facing away from the coil assembly, the power supply assembly being electrically connected to the coil assembly.

[0005] In the purifier according to the embodiment of the present invention, through the arrangement of the purification assembly, the purifier can purify oil fumes to make the gas discharged from the purifier cleaner and safer. The purification assembly is arranged in the receiving space of the shell, so that the structure of the purifier is simple and the production of the miniaturized purifier is facilitated.

[0006] In some embodiments, the side of the support part facing away from the coil assembly is provided with a receiving cavity in which the power supply assembly is arranged.

[0007] In some embodiments, the coil assembly comprises a plurality of mounting columns arranged at intervals and multi-turn coils wound around the mounting columns, and slots are provided on the side of the support part facing towards the coil assembly, and each of the mounting columns is inserted into a respective slot.

[0008] In some embodiments, the purifier further comprises a wind speed sensor and a controller, where the wind speed sensor is connected to the power supply assembly and configured to obtain an amount of air inside the purifier, and the controller is configured to control an operation voltage of the coil assembly according to the amount of air.

[0009] In some embodiments, the purifier further comprises a cover plate, which is arranged on one side of the support part and closes the receiving cavity.

[0010] In some embodiments, the power supply assembly is arranged on the side of the cover plate facing towards the support part, and comprises:

a circuit board;
a transformer arranged on one side of the circuit board; and
a first plug connected to the transformer and configured to be connected to a mains power supply.

[0011] In some embodiments, the side of the cover plate facing towards the receiving cavity is provided with connection columns, two sides of the transformer are provided with flanges, the flanges are provided with connection holes, and the transformer is connected to the cover plate by means of screws passing through the connection holes and the connection columns.

[0012] In some embodiments, the power supply assembly further comprises a second plug arranged on the circuit board, the first plug and the second plug are connected in parallel, and the second plug is configured to be connected

to an external fan.

[0013] In some embodiments, the cover plate is provided with a first hole and a second hole, where the first plug passes through the first hole and is partially located in the receiving cavity, and the second plug passes through the second hole and is partially located in the receiving cavity.

[0014] An embodiment of the present invention provides an extractor hood, including:

the purifier according to any one of the above embodiments; and
a fan connected to the purifier, where the fan is configured for the suction of gas and discharging the gas into the purifier, and the second plug of the purifier is connected to the fan.

[0015] In the purifier of the extractor hood according to the embodiment of the present invention, through the arrangement of the purification assembly, the purifier can purify oil fumes to make the gas discharged from the purifier cleaner and safer. The purification assembly is arranged in the receiving space of the shell, so that the structure of the purifier is simple and the production of the miniaturized purifier is facilitated.

[0016] Additional aspects and advantages of the present invention will be given in part in the following description, and will become apparent in part from the following description or be learned by practice of the present invention.

BRIEF DESCRIPTION OF DRAWINGS

[0017] The above and/or additional aspects and advantages of the present invention will become apparent and readily understood from the description of embodiments in conjunction with the following accompanying drawings, in which:

Fig. 1 is a schematic view of a scene where an extractor hood according to an embodiment of the present invention is applied;
Fig. 2 is a schematic perspective view of a purifier according to an embodiment of the present invention;
Fig. 3 is another schematic perspective view of the purifier according to the embodiment of the present invention;
Fig. 4 is a schematic exploded view of the purifier according to the embodiment of the present invention;
Fig. 5 is another schematic exploded view of the purifier according to the embodiment of the present invention;
Fig. 6 is still another schematic exploded view of the purifier according to the embodiment of the present invention;
Figs. 7-9 are schematic circuit diagrams of an ozone generator for the preparation of ozone according to an embodiment of the present invention;
Fig. 10 is a schematic diagram of the relationship between the (natural bacteria) sterilization efficiency of an air purification module and the ozone generator according to an embodiment of the present invention;
Fig. 11 is a schematic diagram of the relationship between the ammonia removal rate of the air purification module and the ozone generator according to the embodiment of the present invention;
Fig. 12 is a schematic diagram of the relationship between the benzene removal rate of the air purification module and the ozone generator according to the embodiment of the present invention; and
Fig. 13 is a schematic diagram of the relationship between the PM2.5 removal rate of the air purification module and the ozone generator according to the embodiment of the present invention.

[0018] In the drawings, the meanings of the reference numerals are as follows:
extractor hood 1000, housing 1001, inlet 1002, outlet 1003, air duct 10004, fan 1005, cooktop 1006, purifier 100, shell 101, air intake port 1011, air intake hole 10111, purification assembly 102, support part 103, slot 1031, receiving cavity 1032, coil assembly 104, coil 1041, mounting column 1042, grille part 1043, power supply assembly 105, circuit board 1051, transformer 1052, flange 10521, connection hole 10522, first plug 1053, second plug 1054, receiving space 106, cover plate 107, connection column 1071, first hole 1072, second hole 1073, mounting chamber 108, and activated carbon element 109.

DETAILED DESCRIPTION

[0019] Embodiments of the present invention will be described in detail below. Examples of the embodiments are illustrated in the accompanying drawings, where the same or like reference numerals throughout the figures indicates the same or like elements having the same or like functions. The embodiments described below with reference to the accompanying drawings are exemplary and are intended only to explain the present invention instead of being construed as limiting the present invention.

[0020] In the description of the present invention, it should be understood that, descriptions relating to orientation, for example, orientation or positional relationships indicated by "center", "longitudinal", "lateral", "length", "width", "thickness", "up", "down", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inside", "outside", "clockwise", "coun-

terclockwise", etc. are based on the orientation or positional relationships shown in the accompanying drawings, and are to facilitate the description of the present invention and simplify the description only, rather than indicating or implying that the device or element referred to must have a specific orientation or be constructed and operated in a specific orientation, and therefore cannot be construed as limiting the present invention. In addition, the terms "first" and "second" are for descriptive purposes only and should not be construed as indicating or implying relative importance or implicitly indicating the number of technical features indicated. Thus, features defined with "first" and "second" may include one or more of the features either explicitly or implicitly. In the description of the present invention, the term "a plurality of' means two or more, unless otherwise explicitly and specifically defined.

[0021] It should be noted that, in the description of the present invention, the terms "mount", "engage", and "connect" should be interpreted in a broad sense unless explicitly defined and limited otherwise, which, for example, can mean a fixed connection, a detachable connection or an integral connection; can mean a mechanical connection or an electrical connection or being able to communicate with each other; and can mean a direct connection, an indirect connection by means of an intermediary, or internal communication between two elements or an interaction relationship between two elements. For those of ordinary skill in the art, the specific meaning of the terms mentioned above in the present invention should be construed according to specific circumstances.

[0022] In the present invention, unless otherwise explicitly specified or defined, a first feature being "on" or "under" a second feature can include situations where the first feature is in direct contact with the second feature, and can also include situations where the first and second features are in indirect contact by means of another feature therebetween, instead of being in direct contact with each other. Moreover, a first feature being "on", "above" or "over" a second feature includes situations where the first feature is directly above or obliquely above the second feature, or simply indicates that the first feature is higher in level than the second feature. A first feature being "under", "below" or "underneath" a second feature includes situations where the first feature is directly below or obliquely below the second feature, or simply indicates that the first feature is lower in level than the second feature.

[0023] The following disclosure provides many different embodiments or examples for implementing different structures of the present invention. In order to simplify the disclosure of the present invention, components and arrangements of specific examples are described below. Of course, they are only examples and are not intended to limit the present invention. Furthermore, reference numbers and/or letters may be repeated in different examples of the present invention. Such repetitions are for simplification and clearness, which per se do not indicate the relations of the discussed embodiments and/or arrangements. In addition, the present invention provides examples of various specific processes and materials, but the applicability of other processes and/or application of other materials may be appreciated by those of ordinary skill in the art.

[0024] With reference to Figs. 1-6, embodiments of the present invention provide a purifier 100 and an extractor hood 1000. Oil fume extracted by the extractor hood 1000 will enter the purifier 100, and the purifier 100 can purify the oil fumes extracted by the extractor hood 1000, so as to make the gas discharged from the extractor hood 1000 cleaner and safer.

[0025] The present invention is specifically described hereinafter.

[0026] Referring to Figs. 2-6, an embodiment of the present invention provides a purifier 100. The purifier 100 includes a shell 101 and a purification assembly 102. A receiving space 106 is formed in the shell 101, and the purification assembly 102 is arranged in the receiving space 106. The purification assembly 102 includes a support part 103, a coil assembly 104, a grille part 1043 and a power supply assembly 105. The coil assembly 104 is arranged on one side of the support part 103; and the grille part 1043 is connected to the support part 103. The grille part 1043 and the support part 103 form a mounting chamber 108, and an activated carbon element 109 is placed in the mounting chamber 108. The power supply assembly 105 is arranged on one side of the support part 103 facing away from the coil assembly 104, and the power supply assembly 105 is electrically connected to the coil assembly 104.

[0027] In the purifier 100 according to the embodiment of the present invention, through the arrangement of the purification assembly 102, the purifier 100 can purify oil fumes to make the gas discharged from the purifier 100 cleaner and safer. The purification assembly 102 is arranged in the receiving space 106 of the shell 101, so that the structure of the purifier 100 is simple and the production of the miniaturized purifier 100 is facilitated.

[0028] Further, the shell 101 may be cylindrical. In this way, the extractor hood 1000 has a more pleasing appearance, and the structure of the extractor hood 1000 is more compact, which is beneficial to the miniaturization of the extractor hood 1000. It can be understood that the shape of the shell 101 is not limited to a cylindrical shape and the shell 101 can be shaped according to different situations. For example, in other embodiments, the shell 101 may alternatively have a square barrel shape, a variable barrel shape, etc. The specific shape of the shell 101 is not limited here.

[0029] Specifically, the shell 101 may be made of plastic. Plastic is easily accessible and has high plasticity, which is conducive to the mass production of the extractor hood 1000. Of course, the material of the shell 101 is not limited to plastic. The material of the shell 101 may be set according to different situations. For example, the shell 101 may alternatively be made of stainless steel. The specific material of the shell 101 is not limited here.

[0030] Further, the provision of the grille part 1043 enables the further isolation of the oil fumes. When there are too

many substances such as oil fumes, they can be adhered to the grille part 1043, so that the purification effect of the activated carbon element 109 is better.

[0031] The provision of the mounting chamber 108 enables the placement of the activated carbon element 109, thereby making the whole structure of the purifier 100 more compact.

[0032] Referring to Figs. 5 and 6, in some embodiments, the coil assembly 104 includes a plurality of mounting columns 1042 arranged at intervals and multi-turn coils 1041 wound around the mounting columns 1042. Slots 1031 are provided on the side of the support part 103 facing towards the coil assembly 104, and each of the mounting columns 1042 is inserted into a respective slot 1031.

[0033] With the provision of the mounting columns of the coil assembly 104 and the slots 1031, the coil assembly 104 can be stably connected to the support part 103. In this way, during operation of the purifier 100, it is possible to prevent the loosening of the coil assembly 104 from the support part 103, resulting in reducing the purification effect of the purifier 100 or damaging the purifier 100.

[0034] Further, the coils 1041 may be arranged in a regular hexagon, and there are six mounting columns 1042. Each mounting column 1042 is arranged at one of six vertices of the coils 1041. Each coil 1041 is arranged at regular intervals in the lengthwise direction of the mounting column 1042.

[0035] Specifically, applying an operation voltage across the coils 1041 can ionize air to generate ozone. Ozone is a strong oxidant, which can destroy and decompose the cell wall of bacteria, so as to diffuse into the cells and oxidize and decompose glucose oxidase, which is necessary for the bacteria to oxidize glucose. Ozone may also directly interact with bacteria and viruses, thereby destroying the metabolism and reproduction process of the bacteria. In addition, ozone can oxidize various odorous inorganic or organic substances. For example, ozone can decompose odorous gases such as ammonia, benzene and hydrogen sulfide, thereby playing the role of deodorization. In short, ozone takes a short time for sterilization, disinfection and deodorization, and has a strong effect. The use of the coil assembly 104 to ionize air to generate ozone to remove peculiar smells can achieve a good effect.

[0036] Further, reference is made to Figs. 7 to 9. Figs. 7 to 9 are schematic circuit diagrams of the coil assembly 104 for the preparation of ozone. The coil assembly 104 according to the embodiment of the present invention uses a corona discharge method to prepare ozone. Specifically, in the coil assembly 104, oxygen molecules are excited by electrons to obtain energy, and elastically collide with each other to polymerize into ozone molecules. The chemical equation of the coil assembly 104 ionizing air to generate ozone is:

$$3O_2 \rightarrow 2O_3$$

[0037] Referring to Figs. 5 and 6, in some embodiments, the side of the support part 103 facing away from the coil assembly 104 is provided with a receiving cavity 1032, and the power supply assembly 105 is arranged in the receiving cavity 1032.

[0038] The provision of the receiving cavity 1032 facilitates the placement of the power supply assembly 105, and makes the structure of the purifier 100 more compact, which is beneficial to the production of the miniaturized purifier 100.

[0039] Further, the receiving cavity 1032 may be circular. Of course, the shape of the receiving cavity 1032 is not limited to a circular shape. The specific shape of the receiving cavity 1032 may be set according to different situations. For example, the receiving cavity 1032 may alternatively be square, polygonal, etc. The specific shape of the receiving cavity 1032 is not limited here.

[0040] In some embodiments, the purifier 100 further includes a wind speed sensor (not shown) and a controller (not shown). The wind speed sensor is connected to the power supply assembly 105 and configured to obtain an amount of air inside the purifier 100, and the controller is configured to control an operation voltage of the coil assembly 104 according to the amount of air.

[0041] The wind speed sensor is connected to the power supply assembly 105. The wind speed sensor can adjust the voltage of the power supply assembly 105 according to the amount of air inside the purifier 100, so as to control the operation voltage of the coil assembly 104. The operation voltage of the coil assembly 104 is directly proportional to the amount of ozone ionized by the coil assembly 104. In this way, the purifier 100 is more intelligent.

[0042] During cooking, the amounts of oil fumes caused by cooking different dishes are different. A user can adjust the oil fume extraction power of the extractor hood 1000 according to different dishes. The smaller the power, the less oil fume particles are entrained in the wind, and the greater the power, the more oil fume particles are entrained in the wind. When the amount of air entering the purifier 100 is small and the wind speed sensor recognizes a small amount of air, the voltage of the power supply assembly 105 is adjusted to control the operation voltage of the coil assembly 104 to decrease, thereby reducing the amount of ozone generated by the coil assembly 104. When the amount of air entering the purifier 100 is large and the wind speed sensor recognizes a large amount of air, the voltage of the power supply assembly 105 is adjusted to control the operation voltage of the coil assembly 104 to increase, thereby increasing the amount of ozone generated by the coil assembly 104. Therefore, the purifier 100 is more intelligent and energy-saving, and the purifier 100 will adjust the amount of ozone generated by the coil assembly 104 with the amount of air

entering the purifier 100. In this way, the situation will not occur where the coil assembly 104 still generates a large amount of ozone when the amount of air inside the purifier 100 is small, which will cause waste of resources.

[0043] Specifically, there may be multiple settings in the wind speed sensor. Different settings correspond to different amounts of air, and different amounts of air correspond to different operation voltages of the coil assembly 104. The specific settings can be adjusted according to different situations. For example, there may be three, four, or five settings, etc. The specific number of settings is not limited here.

[0044] Referring to Figs. 2 and 5, further, the shell 101 is provided with an air intake port 1011. The air intake port 1011 is provided with a plurality of air intake holes 10111, and the air intake port 1011 is arranged on the side of the shell 101 facing away from the coil assembly 104. The external oil fumes enter the interior of the purifier 100 through the air intake holes 10111.

[0045] Further, different operation voltages correspond to different powers of the coil assembly 104.

[0046] Reference is made to Fig. 10 and Table 1 below. Fig. 10 is a schematic diagram of the relationship between the (natural bacteria) sterilization efficiency of the purifier 100 and the coil assembly 104 according to the embodiment of the present invention. The horizontal axis represents the power of the coil assembly 1040 in watts (W), and the vertical axis represents the (natural bacteria) sterilization efficiency in percentage (%). Table 1 shows the analysis and detection results of the purifier 100 with respect to the antibacterial (sterilization) function of natural bacteria according to the embodiment of the present invention. The detection test shows that the (natural bacteria) sterilization efficiency of the coil assembly 104 reaches 92.4% after 24 hours, and the sterilization effect is good.

Table 1

Analysis item	Time of operation	Type of test bacteria	Detection result				Detection method
			Serial number	Bacteria content in air for test group before test (CFU/m^3)	Bacteria content in air for test group after test (CFU/m^3)	Antibacterial (sterilization) rate (%)	
Antibacterial (sterilization) function	24h	Natural bacteria	1	6.43×102	49	92.4	"Technical Specification for Disinfection " (2002 Edition) 2.1.3

[0047] Reference is made to Figs. 11 and 12 and Table 2. Fig. 11 is a schematic diagram of the relationship between the ammonia removal rate of the purifier 100 and the coil assembly 104 according to the embodiment of the present invention. The horizontal axis represents the power of the coil assembly 104 in watts (W), and the vertical axis represents the ammonia removal rate in percentage (%). Fig. 12 is a schematic diagram of the relationship between the benzene removal rate of the purifier 100 and the coil assembly 104 according to the embodiment of the present invention. The horizontal axis represents the power of the coil assembly 104 in watts (w), and the vertical axis represents the benzene removal rate in percentage (%). Table 2 shows the analysis and detection results of the purifier 100 with respect to ammonia and benzene according to the embodiment of the present invention. The detection test shows that after 24 hours, the ammonia removal rate of the purifier 100 reaches 88.7% and the benzene removal rate reaches 97.6%, and the effects are good.

Table 2

Analysis item	Time of operation	Detection result		Removal rate (%)	Detection method
		Concentration of pollutants in blank test chamber (mg/m^3)	Concentration of pollutants in a sample test chamber (mg/m^3)		
Ammonia	24h	11.54	1.30	88.7	QB/T 2761-2006
Benzene		9.8	0.23	97.6	

[0048] Table 3 shows the analysis and detection results of the purifier 100 with respect to the antibacterial (sterilization)

function of Staphylococcus albus 8799 according to the embodiment of the present invention. The detection test shows that after one hour, the antibacterial (sterilization) rate of the purifier 100 to Staphylococcus albus 8799 is about 95%, and the effect is good.

Table 3

Analysis item	Time of operation	Type of test bacteria	Detection result							Detection method
			Serial number	Bacte ria conte nt in air for blank group befor e test (CFU /m^3)	Bac teri a cont ent in air for blan k gro up afte r test (CF U/ m^3)	Natural death rate (%)	Bacteria content in air for test group before test The (CFU/m^3)	Bacteria content in air for test group after test The (CFU/m^3)	Ant ibac teri al (ste riliz atio n) rate (%)	
Antibact erial (steriliza tion) function	1h	Staphylo coccus albus 8799	1	8.13×10^4	5.94×10^4	26.9	8.24×10^4	2.70×10^3	95.5 2	"Technical Specificati on for Disinfectio n " (2002 Edition) 2.1.3
			2	7.47×10^4	5.31×10^4	28.9	7.48×10^4	2.92×10^3	94.5 1	
			3	7.95×10^4	5.66×10^4	28.8	7.87×10^4	3.00×10^3	94.6 5	

[0049] Reference is made to Fig. 13 and Table 4. Fig. 13 is a schematic diagram of the relationship between the PM2.5 removal rate of the purifier 100 and the coil assembly 104 according to the embodiment of the present invention, in which the horizontal axis represents the power of the coil assembly 104 in watts (W), and the vertical axis represents the PM2.5 removal rate in percentage (%). Table 4 shows the analysis and detection results of the purifier 100 with respect to PM2.5 according to the embodiment of the present invention. The detection test shows that the PM2.5 removal rate of the purifier 100 reaches 96.3% within 4 hours, and the effect is good.

Table 4

Analysis item	Detection result		Removal rate under test conditions (%)	Detection method
	Concentration (mg/m^3) at the time when a sample is placed therein	Concentration (mg/m) after the sample is placed therein for 4h		
PM2.5	6.23	0.228	96.3	Refer to APAIC/LM 01-2013 "Evaluation Standard for Purification Performance of Indoor Air Purifier 100"

[0050] Table 5 shows the analysis and detection results of the purifier 100 with respect to the PM2.5-based clean air delivery rate according to the embodiment of the present invention. The detection test shows that the PM2.5-based clean air delivery rate of the purifier 100 reaches 15.5 m^3/h, that is to say, the purifier 100 not only has a good removal rate, but also has a large clean air delivery rate.

Table 5

Analysis item	Detection result	Unit of measurement	Detection method
PM2.5-based clean air delivery rate ($CADR_{PM25}$)	15.5	m^3/h	APAIC/LM 01-2013 (Appendix B)

[0051] It can be seen from the above diagrams that the purifier 100 according to the embodiment of the present invention has a removal rate of 92.4% for natural bacteria, 96.3% for PM2.5, 88.7% for ammonia, 97.6% for benzene and about 95% for Staphylococcus albus. That is to say, the detection tests show that the removal rate of the purifier 100 according to the embodiment of the present invention can reach a removal rate of 88% or more for each object to be removed, and the removal rates for most of the objects to be removed can reach about 95%, having a good effect.

[0052] Referring to Figs. 4 to 6, in some embodiments, the purifier 100 further includes a cover plate 107. The cover plate 107 is arranged on one side of the support part 103, and the cover plate 107 closes the receiving cavity 1032.

[0053] The provision of the cover plate 107 enables the closing of the receiving cavity 1032, so that the power supply assembly 105 in the receiving cavity 1032 is prevented from falling from the receiving cavity 1032, thereby improving the service life and operation efficiency of the purifier 100.

[0054] Further, the cover plate 107 may be made of plastic. It can be understood that the material of the cover plate 107 is not limited to plastic. The specific material of the cover plate 107 may be set according to different situations. For example, the cover plate 107 may alternatively be made of stainless steel, and the specific material of the cover plate 107 is not limited here.

[0055] Specifically, the cover plate 107 and the shell 101 may be fixed by means of screws, which are strong in fixing firmness and convenient for removing the cover plate 107 from the shell 101 or installing the cover plate 107 to the shell 101. Of course, the fixation means of the cover plate 107 and the shell is not limited to screws. The connection means for the cover plate 107 and the shell 101 may be selected according to different situations. For example, the cover plate 107 and the shell 101 may alternatively be fixed by means of bonding or snap-fitting, and the specific connection between the cover plate 107 and the shell 101 is not limited here.

[0056] Referring to Figs. 5 and 6, in some embodiments, the power supply assembly 105 is arranged on the side of the cover plate 107 facing towards the support part 103. The power supply assembly 105 includes a circuit board 1051, a transformer 1052 and a first plug 1053. The transformer 1052 is arranged on one side of the circuit board 1051, and the first plug 1053 is connected to the transformer 1052. The first plug 1053 is configured to be connected to a mains power supply.

[0057] The first plug 1053 is configured to be connected to the mains power supply to power the transformer 1052. The transformer 1052 converts the voltage of 220 V of the mains power supply into a high voltage and transmits it to

the coil assembly 104 through the circuit board 1051, so that an operation voltage is formed in the coil assembly 104 to generate ozone.

[0058] Further, the circuit board 1051 may be a printed circuit board, which has the advantages of high operation efficiency and low costs. The printed circuit board as the circuit board 1051 is beneficial to the mass production of the purification assembly 102. It can be understood that the circuit board 1051 is not limited to a printed circuit board. The specific type of circuit board 1051 may be selected according to different situations. For example, the circuit board 1051 may alternatively be a flexible printed circuit board, a rigid-flex board, etc. The specific material of the circuit board 1051 is not limited here.

[0059] Referring to Fig. 5, in some embodiments, the side of the cover plate 107 facing towards the receiving cavity 1032 is provided with connection columns 1071, two sides of the transformer 1052 are provided with flanges 10521, and the flanges 10521 are provided with connection holes 10522. The transformer 1052 is connected to the cover plate 107 by means of screws passing through the connection holes 10522 and the connection columns 1071.

[0060] Through the arrangement of the connection holes 10522 in the flanges 10521 of the transformer 1052 and the connection columns 1071 on the cover plate 107, the transformer 1052 is fixedly connected to the cover plate 107, so that it is possible to prevent the situation where the purifier 100 cannot be used due to the looseness of the transformer 1052 during the operation of the purifier 100.

[0061] It can be understood that fixation of the transformer 1052 and the cover plate 107 is not limited to the above manner. The connection between the transformer 1052 and the cover plate 107 may be set according to different situations. For example, the transformer 1052 and the cover plate 107 may alternatively be fixedly connected by means of adhesive bonding or snap-fitting, and the specific connection between the transformer 1052 and the cover plate 107 is not limited here.

[0062] Further, the transformer 1052 may be a high-voltage transformer 1052. The high-voltage transformer 1052 is configured to convert the effective value of 220 V of the standard voltage most commonly used by residents into a high voltage for use by the coil assembly 104. For example, the high-voltage transformer 1052 can boost voltage by changing the turn ratio of the inductance coils.

[0063] Referring to Figs. 3 to 6, in some embodiments, the power supply assembly 105 further includes a second plug 1054 arranged on the circuit board 1051. The first plug 1053 and the second plug 1054 are connected in parallel, and the second plug 1054 is configured to be connected to an external fan.

[0064] The second plug 1054 may be connected to the external fan, so that when the purifier 100 is powered on, the external fan is also powered on. In this way, it is not necessary to connect both the purifier 100 and the external fan to the mains power supply, which makes the connection more convenient.

[0065] Referring to Figs. 3 to 6, in some embodiments, the cover plate 107 is provided with a first hole 1072 and a second hole 1073. The first plug 1053 passes through the first hole 1072 and is partially located in the receiving cavity 1032, and the second plug 1054 passes through the second hole 1073 and is partially located in the receiving cavity 1032.

[0066] The arrangement of the first hole 1072 and the second hole 1073 facilitates the connection between the purifier 100 and the external power supply device, and the connection between the purifier 100 and the external extractor hood.

[0067] Referring to Fig. 1, an embodiment of the present invention provides an extractor hood 1000. The extractor hood 1000 includes the purifier 100 of any one of the above embodiments and a fan 1005 connected to the purifier 100. The fan 1005 is configured for the suction of gas and discharging the gas into the purifier 100, and a second plug 1054 of the purifier 100 is connected to the fan 1005.

[0068] In the purifier 100 of the extractor hood 1000 according to the embodiment of the present invention, through the arrangement of the purification assembly 102, the purifier 100 can purify oil fumes to make the gas discharged from the purifier 100 cleaner and safer. The purification assembly 102 is arranged in the receiving space 106 of the shell 101, so that the structure of the purifier 100 is simple and the production of the miniaturized purifier 100 is facilitated.

[0069] Further, the extractor hood 1000 further includes a housing 1001. The housing 1001 includes an inlet 1002 and an outlet 1003. The outlet 1003 is docked with the air intake port 1011 of the purifier 100. An air duct 1004 is formed in the housing 1001, and the fan 1005 is arranged in the air duct 1004. The fan 1005 is configured to create an air flow from the inlet 1002 to the outlet 1003. During operation, the fan 1005 can suck oil fumes into the air duct 1004 through the inlet 1002 and send the oil fumes into the purifier 100 through the outlet 1003 and the air intake port 1011 of the purifier 100. After being purified in the purifier 100, the oil fumes are discharged from the purifier 100. At this time, the oil fumes discharged by the purifier 100 are cleaner and safer.

[0070] Specifically, the housing 1001 may be made of plastic. Plastic is easily accessible and has high plasticity, which is conducive to the mass production of the extractor hood 1000. Of course, the material of the housing 1001 is not limited to plastic. The housing 1001 may be made of different materials according to different situations. For example, the housing 1001 may alternatively be made of stainless steel. The specific material of the housing 1001 is not limited here.

[0071] Further, in order to prolong the service life of the extractor hood 1000, a filter screen may be provided at the outlet 1003. The filter screen can filter the oil fumes with larger particles to prevent the oil fumes with larger particles from directly entering the purifier 100 and affecting the normal operation of the purifier 100.

[0072] Still further, the extractor hood 1000 may be arranged above a cooktop 1006, and the inlet 1002 of the extractor hood 1000 is close to the cooktop 1006, so that when the user uses the cooktop 1006 for cooking, the extractor hood 1000 can suck substances such as oil fumes and prevent the substances such as oil fumes from spreading around the cooktop 1006, thereby improving the user experience.

[0073] In the description, the explanation with reference to the term "one embodiment", "some embodiments", "exemplary embodiment", "example", "specific example", "some examples", etc. means that the specific features, structures, materials or features described in conjunction with this embodiment or example are included in at least one embodiment or example of the present invention. In the description, the illustrative expressions of the above-mentioned terms do not necessarily refer to the same embodiments or examples. Moreover, the specific features, structures, materials or characteristics described can be combined in any one or more embodiments or examples in any suitable manner.

[0074] Although the embodiments of the present invention have been shown and described, it can be understood by those of ordinary skill in the art that various changes, modifications, substitutions and variations may be made to these embodiments without departing from the principles and objectives of the present invention, and the scope of the present invention is defined by the claims and their equivalents.

Claims

1. A purifier, **characterized by** comprising:

    a shell in which a receiving space is formed;
    a purification assembly arranged in the receiving space, the purification assembly comprising:

        a support part;
        a coil assembly arranged on one side of the support part;
        a grille part connected to the support part, wherein the grille part and the support part form a mounting chamber in which an activated carbon element is placed; and
        a power supply assembly arranged on one side of the support part facing away from the coil assembly, wherein the power supply assembly is electrically connected to the coil assembly.

2. The purifier according to claim 1, **characterized in that** the side of the support part facing away from the coil assembly is provided with a receiving cavity in which the power supply assembly is arranged.

3. The purifier according to claim 2, **characterized in that** the coil assembly comprises a plurality of mounting columns arranged at intervals and multi-turn coils wound around the mounting columns, and slots are provided on one side of the support part facing towards the coil assembly, and each of the mounting columns is inserted into a respective slot.

4. The purifier according to claim 1, **characterized by** further comprising a wind speed sensor and a controller, wherein the wind speed sensor is connected to the power supply assembly and configured to obtain an amount of air inside the purifier, and the controller is configured to control an operation voltage of the coil assembly according to the amount of air.

5. The purifier according to claim 1, **characterized in that** the purifier further comprises a cover plate, which is arranged on one side of the support part and closes the receiving cavity.

6. The purifier according to claim 5, **characterized in that** the power supply assembly is arranged on one side of the cover plate facing towards the support part, and comprises:

    a circuit board;
    a transformer arranged on one side of the circuit board; and
    a first plug connected to the transformer and configured to be connected to a mains power supply.

7. The purifier according to claim 6, **characterized in that** one side of the cover plate facing towards the receiving cavity is provided with connection columns, two sides of the transformer are provided with flanges, the flanges are provided with connection holes, and the transformer is connected to the cover plate by means of screws passing through the connection holes and the connection columns.

8. The purifier according to claim 6, **characterized in that** the power supply assembly further comprises a second plug, which is arranged on the circuit board and configured to be connected to an external fan.

9. The purifier according to claim 8, **characterized in that** the cover plate is provided with a first hole and a second hole, wherein the first plug passes through the first hole and is partially located in the receiving cavity, and the second plug passes through the second hole and is partially located in the receiving cavity.

10. An extractor hood **characterized by** comprising:

the purifier of any one of claims 1-9; and
a fan connected to the purifier, wherein the fan is configured for the suction of gas and discharging the gas into the purifier.

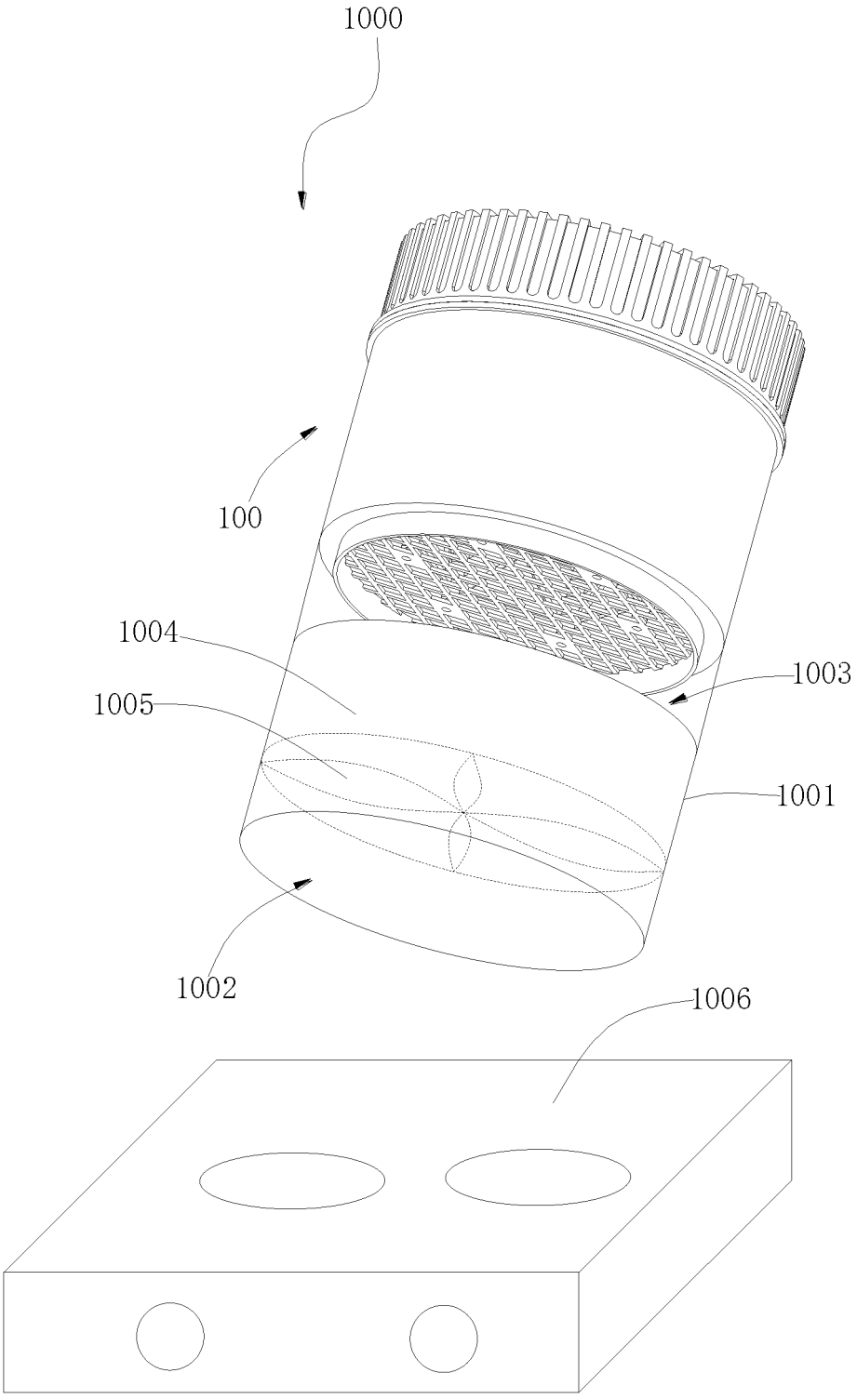


Fig. 1

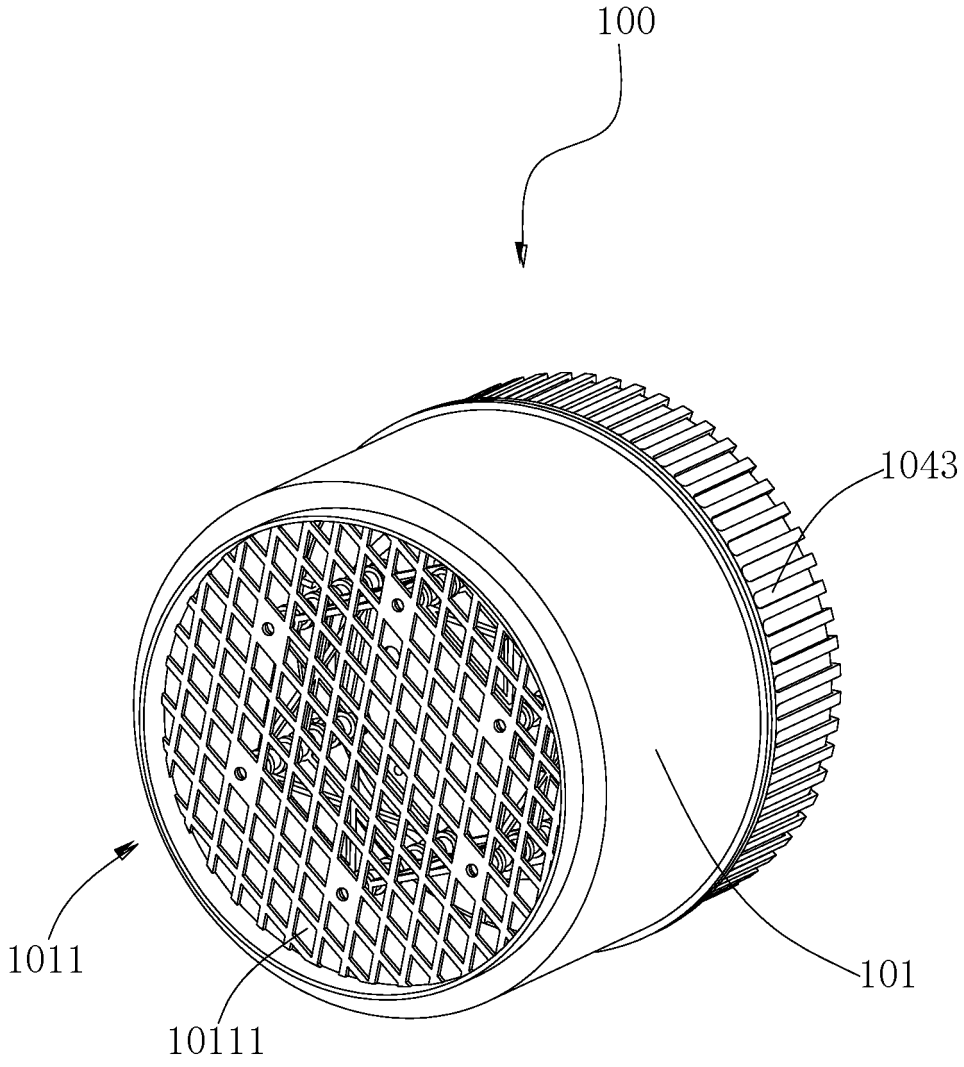


Fig. 2

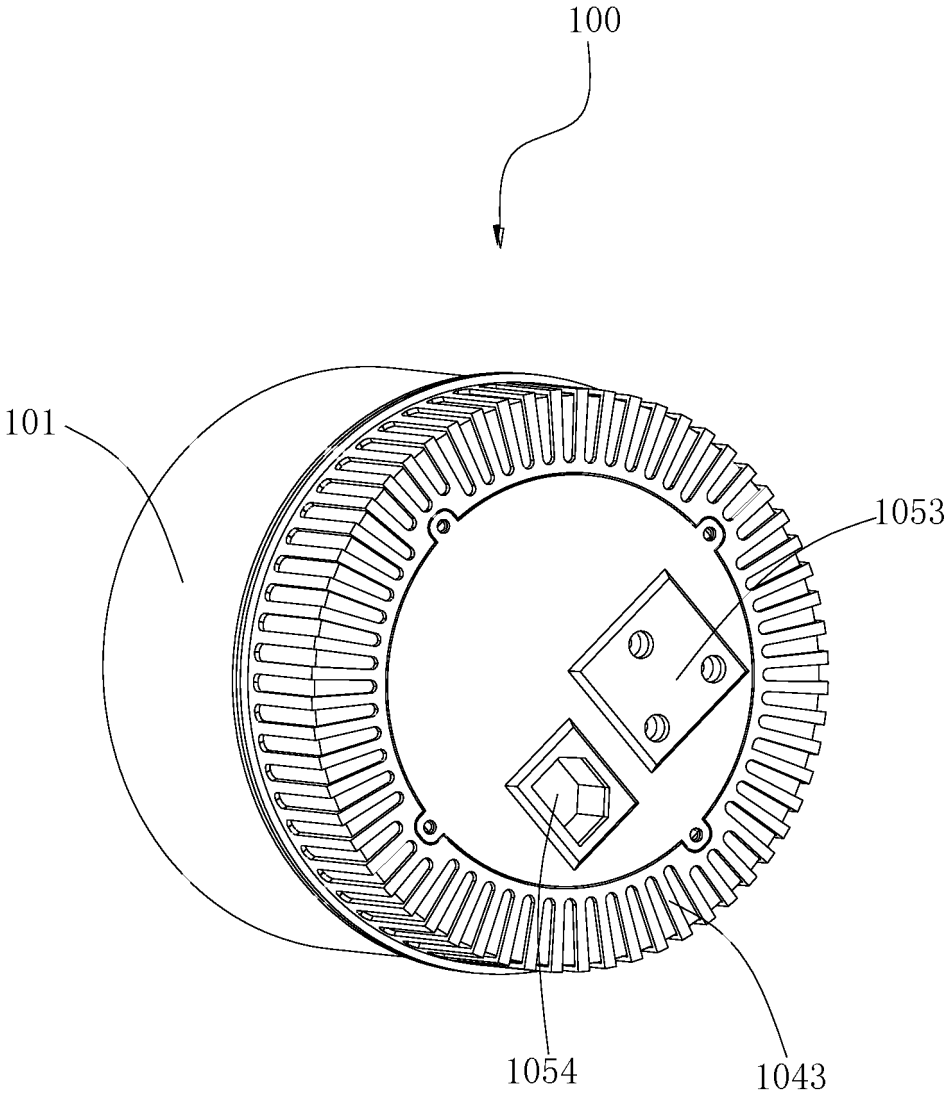


Fig. 3

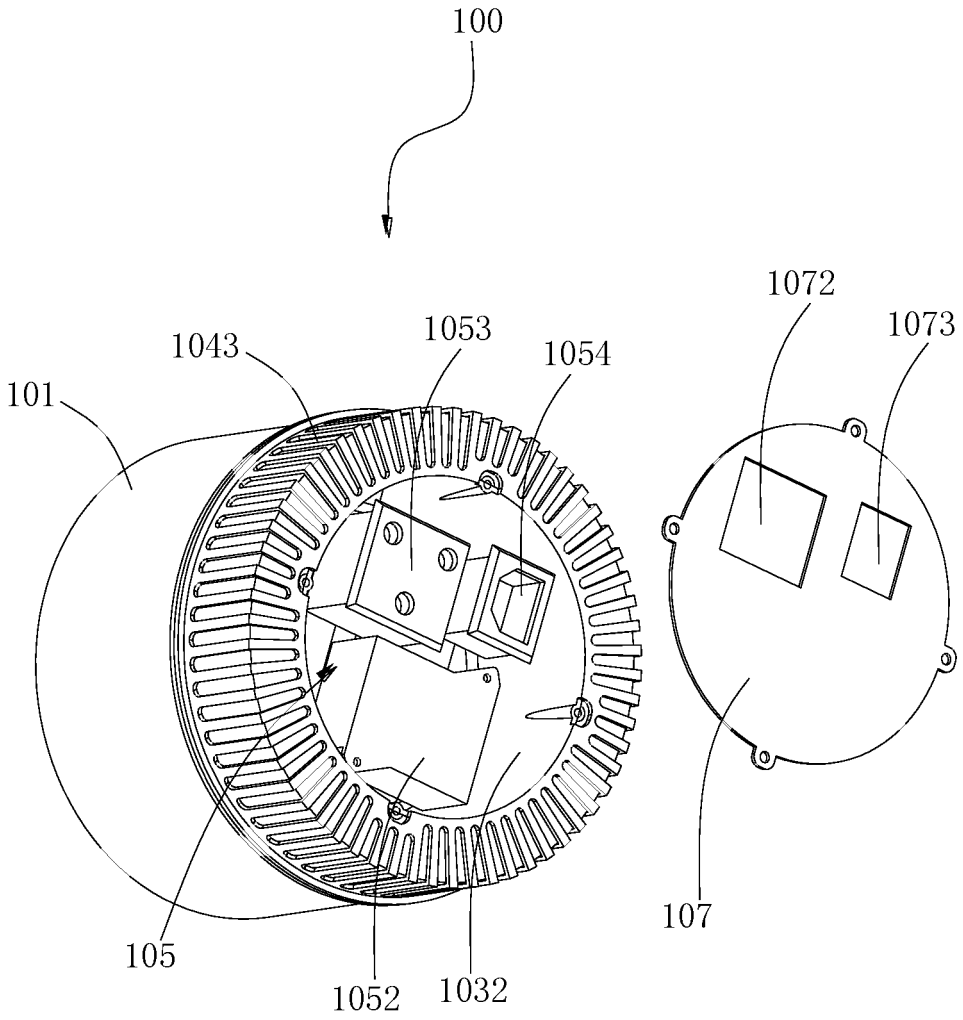


Fig. 4

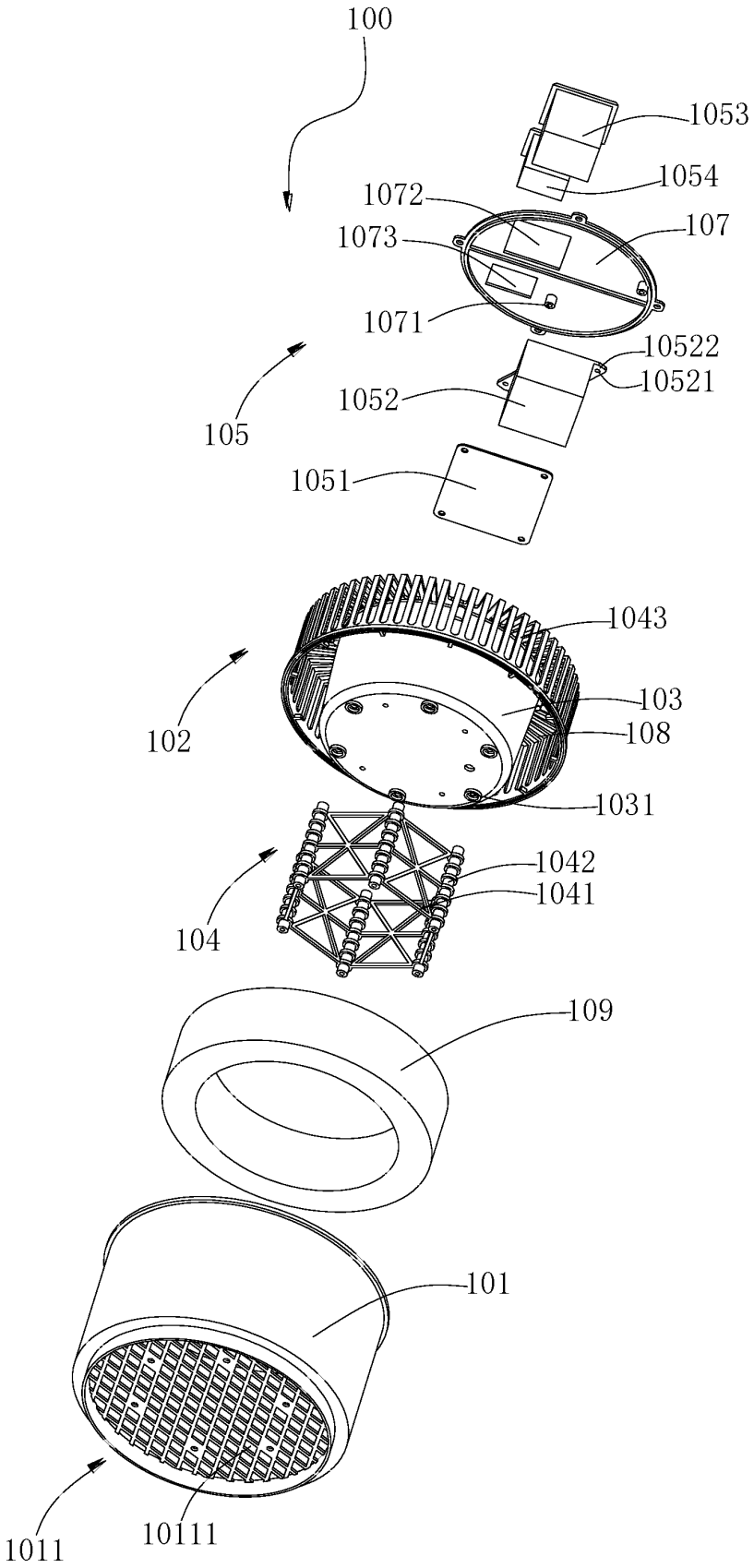
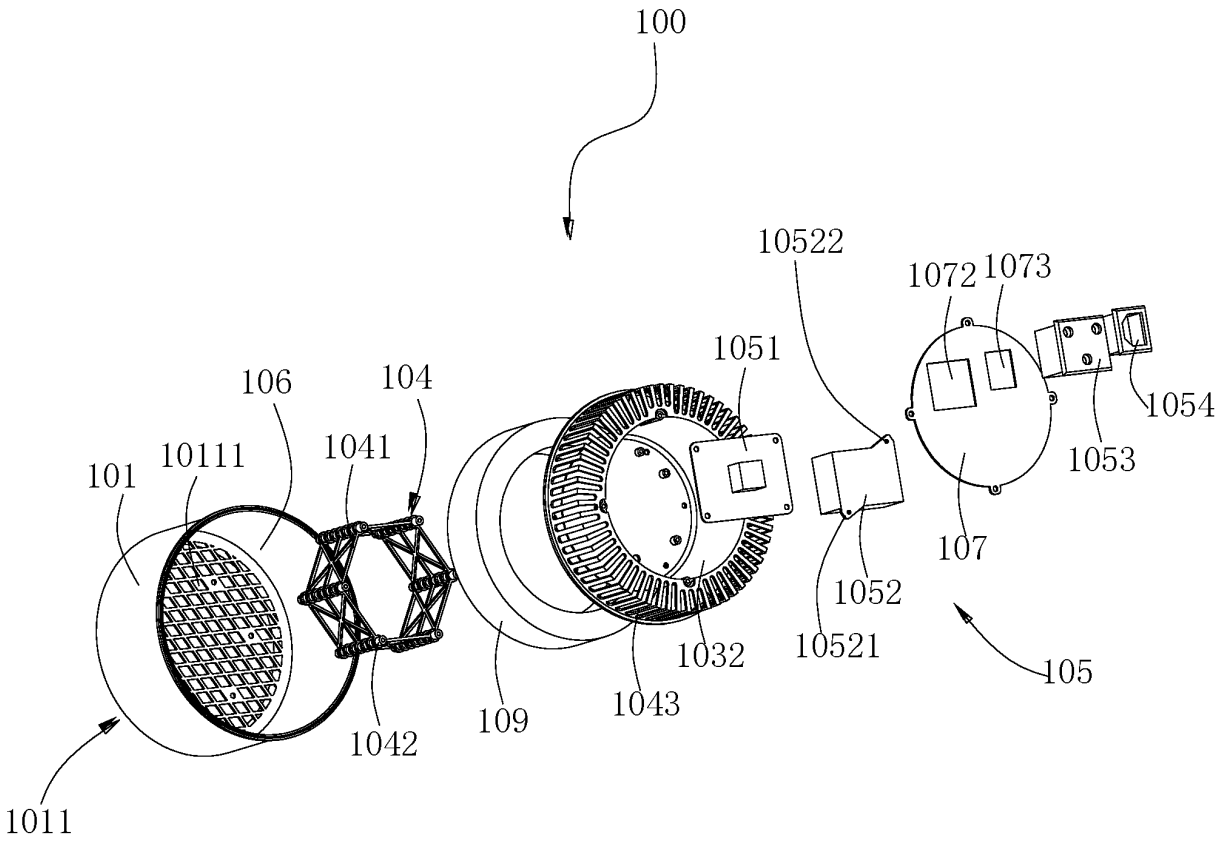

100
1053
1054
1072
1073
107
1071
10522
10521
1052
105
1051
1043
103
102
108
1031
1042
1041
104
109
101
1011
10111

Fig. 5


100
10522
1072
1073
1051
106
104
1054
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107
1052
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1032
105
109
1043
1042
1011

Fig. 6

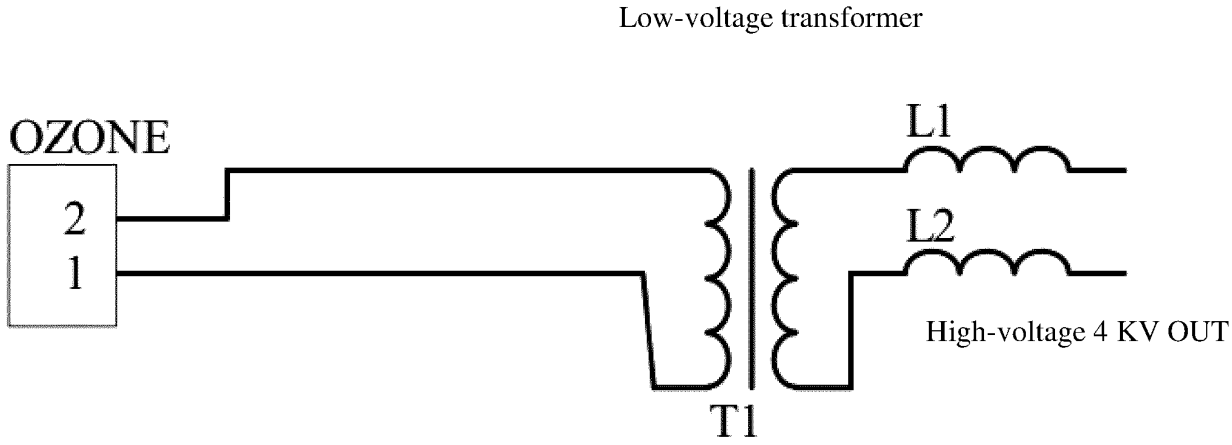
Low-voltage transformer
OZONE
2
1
L1
L2
High-voltage 4 KV OUT
T1

Fig. 7

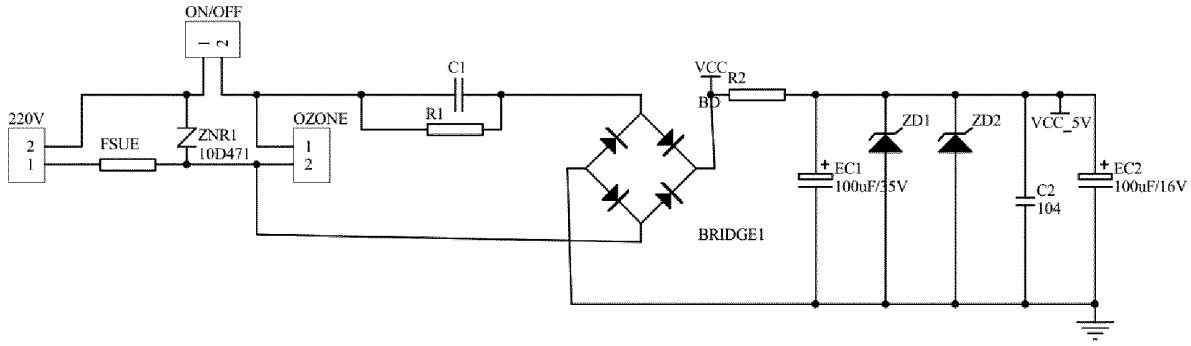
ON/OFF
220V
FSUE
ZNR1
10D471
OZONE
C1
R1
VCC
R2
BD
BRIDGE1
ZD1
ZD2
VCC_5V
EC1
100uF/35V
C2
104
EC2
100uF/16V

Fig. 8

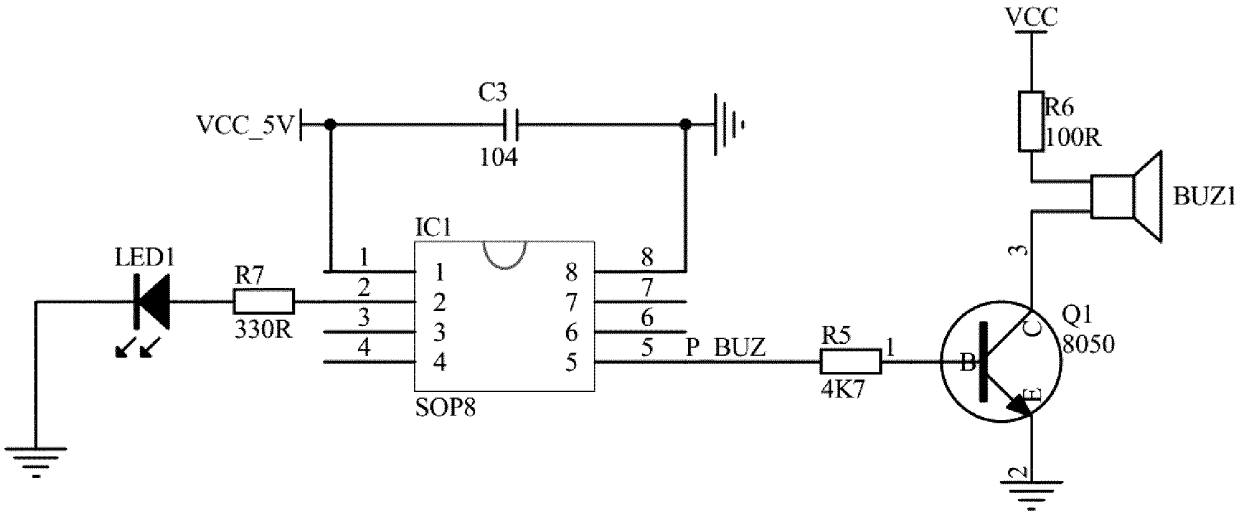
VCC
C3
104
VCC_5V
R6
100R
BUZ1
IC1
LED1
R7
330R
SOP8
P BUZ
R5
4K7
Q1
8050
C
B
E

Fig. 9

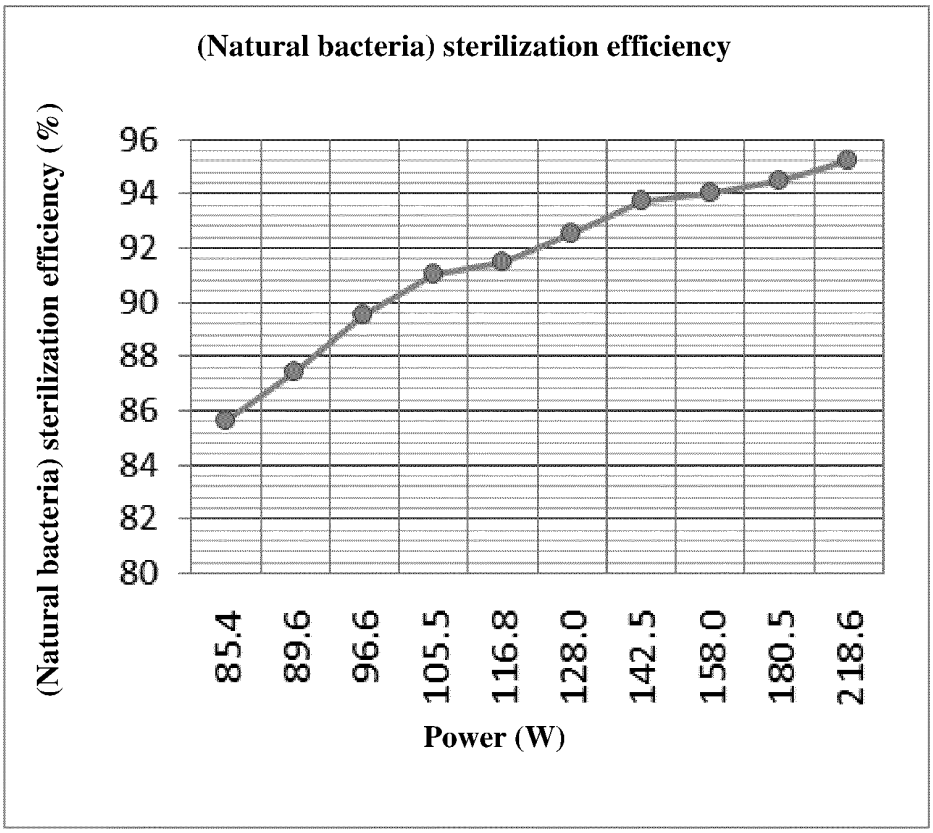
(Natural bacteria) sterilization efficiency
(Natural bacteria) sterilization efficiency (%)
96
94
92
90
88
86
84
82
80
85.4
89.6
96.6
105.5
116.8
128.0
142.5
158.0
180.5
218.6
Power (W)

Fig. 10

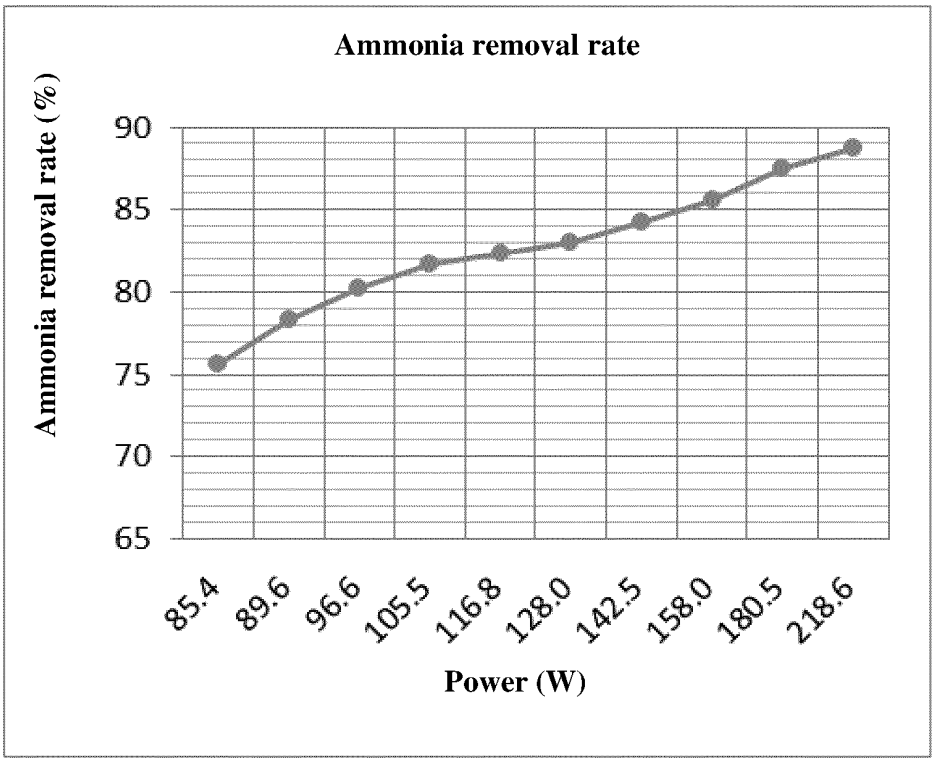
Ammonia removal rate
Ammonia removal rate (%)
90
85
80
75
70
65
85.4
89.6
96.6
105.5
116.8
128.0
142.5
158.0
180.5
218.6
Power (W)

Fig. 11

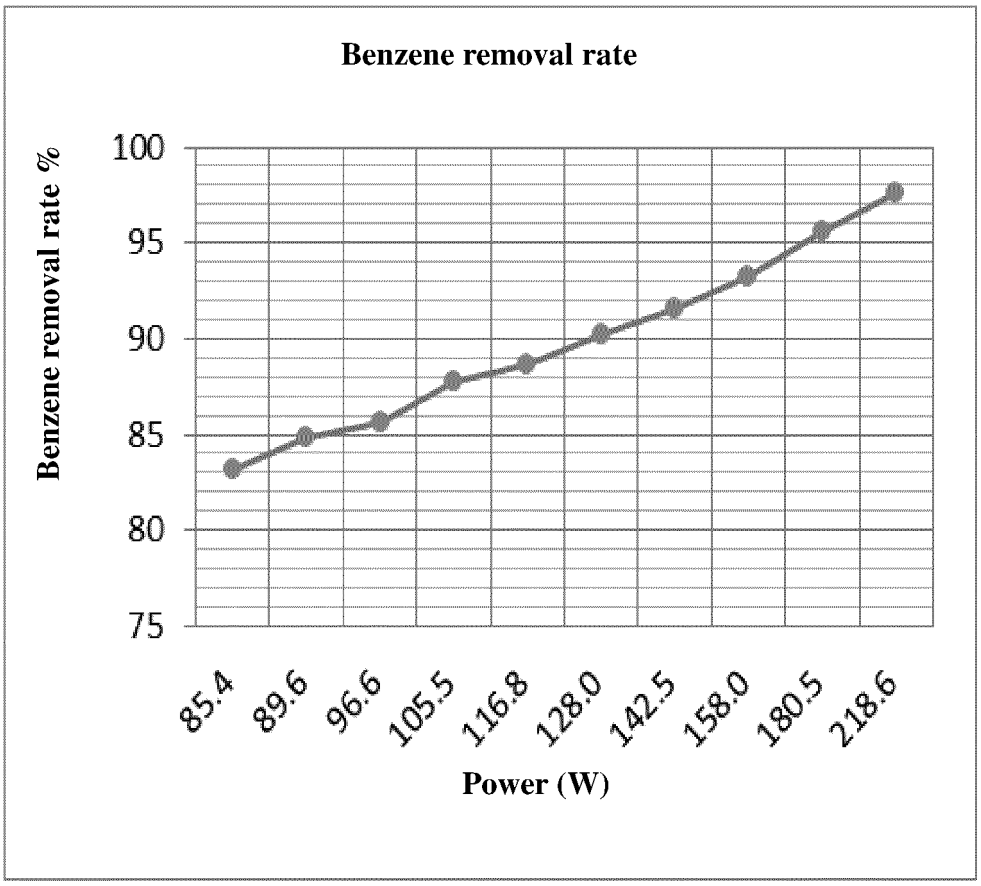
Benzene removal rate
Benzene removal rate %
100
95
90
85
80
75
85.4
89.6
96.6
105.5
116.8
128.0
142.5
158.0
180.5
218.6
Power (W)

Fig. 12

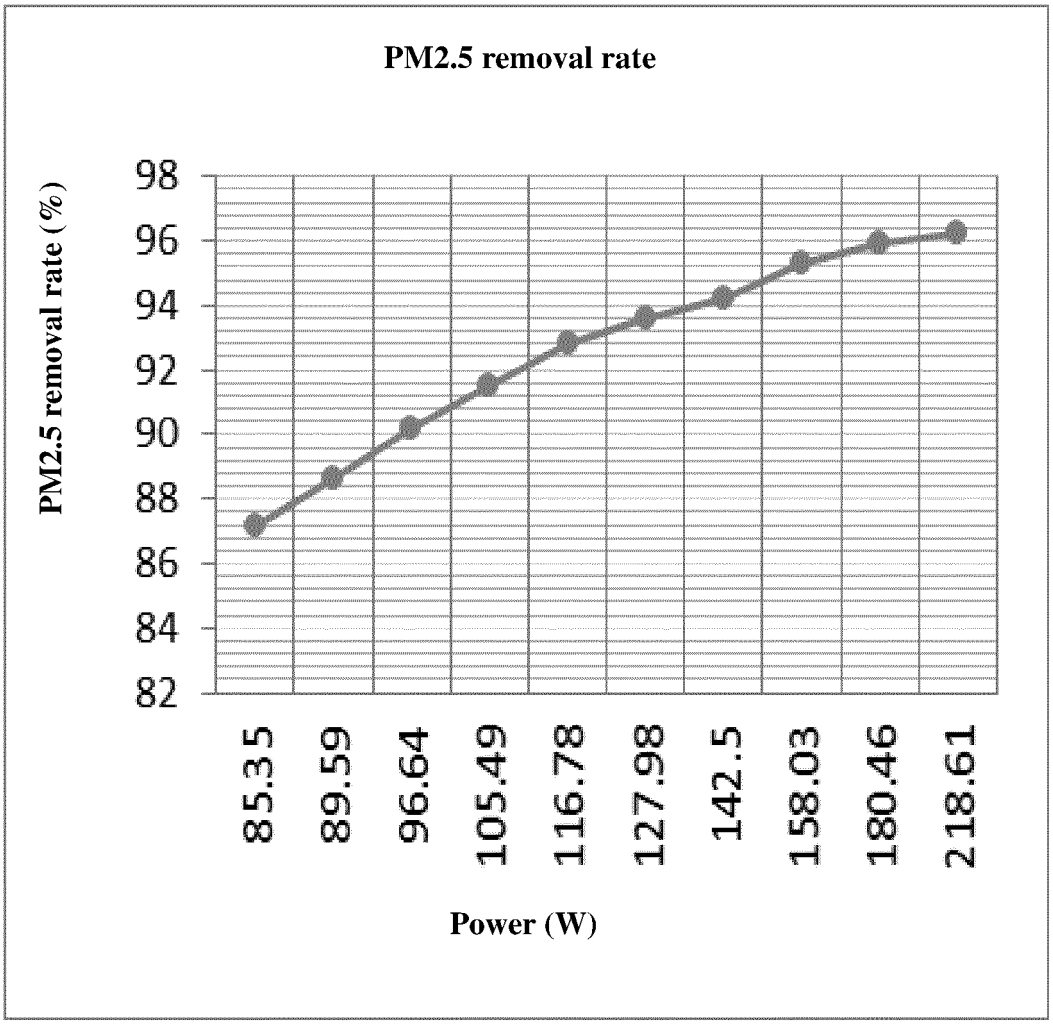
PM2.5 removal rate
PM2.5 removal rate (%)
98
96
94
92
90
88
86
84
82
85.35
89.59
96.64
105.49
116.78
127.98
142.5
158.03
180.46
218.61
Power (W)

Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/120026

A. CLASSIFICATION OF SUBJECT MATTER

F24F 3/16(2006.01)i; F24F 13/28(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)

F24F,F24C

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)

CNABS; CPRSABS; CNKI; CNTXT; VEN: 净化, 静电, 过滤, 滤网, 桶, 筒, 环, 腔, 空间, 安装, 容置, 放置, 凹, 槽, 放电, 供电, 臭氧, 电离, purify, fliter, cleaning, electrostatic, static, cylinder, container, can, circul+, cavity, hollow, chamber, cavum, recess, groove, ozone, ioniz+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 208635219 U (SHENZHEN KANGBOSHI HEALTH TECHNOLOGY CO., LTD.) 22 March 2019 (2019-03-22) description, pages 2-4, and figures 1-5	1-13
Y	CN 208536081 U (FOSHAN CITY SHUNDE DISTRICT HEJIE ELECTRICAL APPLIANCE INDUSTRIAL CO., LTD.) 22 February 2019 (2019-02-22) description, pages 2-10, and figures 1-18	1-13
A	CN 108348832 A (HATA CO., LTD. et al.) 31 July 2018 (2018-07-31) entire document	1-13
A	KR 20170011635 A (BKW CO., LTD.) 02 February 2017 (2017-02-02) entire document	1-13
A	CA 2910481 A1 (THE PROCTER & GAMBLE COMPANY) 13 November 2014 (2014-11-13) entire document	1-13

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 February 2020	**24 February 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/120026

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 208635219 U	22 March 2019	None	
CN 208536081 U	22 February 2019	None	
CN 108348832 A	31 July 2018	JP 2018532975 A	08 November 2018
		US 2018256770 A1	13 September 2018
		WO 2017048085 A1	23 March 2017
KR 20170011635 A	02 February 2017	KR 101718616 B1	24 March 2017
CA 2910481 A1	13 November 2014	CN 105228721 A	06 January 2016
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		JP 2016517800 A	20 June 2016
		CA 2910481 C	09 January 2018
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		WO 2014182988 A2	13 November 2014
		WO 2014182988 A3	31 December 2014
		EP 2994215 A2	16 March 2016
		JP 2018047465 A	29 March 2018
		KR 20180102220 A	14 September 2018
		JP 6595566 B2	23 October 2019
		AU 2014262584 B2	30 March 2017
		US 9579597 B2	28 February 2017
		BR 112015028119 A2	25 July 2017
		KR 20150139592 A	11 December 2015
		US 2014331625 A1	13 November 2014

Form PCT/ISA/210 (patent family annex) (January 2015)