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(54) **AIR TREATMENT SYSTEM**

(57) Disclosed is an air handling system, comprising a top cover (1), a fan (2), an air inlet (3) and an air outlet (4), wherein the air inlet (3) is provided at the bottom of the top cover (1), the air outlet (4) is provided at the top of the top cover, and the fan (2) is provided inside the top cover (1) and is close to the air outlet (4). By increasing the distance between the air inlet (3) and the fan (2), a sufficient space is provided for the adjustment of air flow, and thus the noise can be reduced.

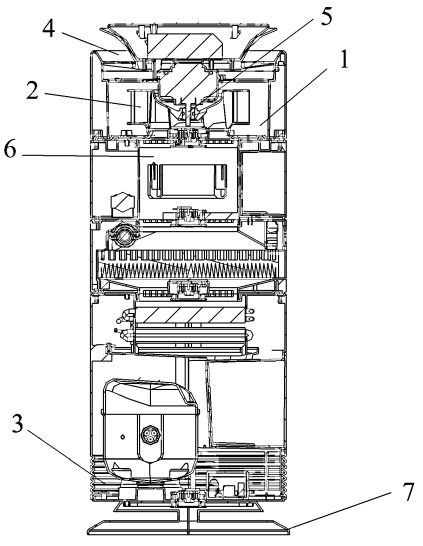

Fig. 1

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Description

Technical Field

[0001] The present invention belongs to the field of cleaning equipment and, in particular, to an air handling system.

Background of the Invention

[0002] At present, living standards are improved, air conditioners have become essential household appliances. In the summer, the air conditioners can reduce the indoor ambient temperature, and provide people with a comfortable environment, but the air conditioners will produce a lot of noise, and the utilization of the wind is not high. Therefore, there is a need for a low-noise air handling system for full utilization of the gas entering the air inlet.

Summary of the Invention

[0003] Therefore, the present invention provides an air handling system capable of reducing noise and increasing the utilization of the gas entering the air inlet.

[0004] An air handling system comprises a top cover, a fan, an air inlet and an air outlet, wherein the air inlet is provided at the bottom of the air handling system, the air outlet is provided at the top of the top cover, and the fan is provided inside the top cover and is close to the air outlet.

[0005] The air handling system further comprises a motor provided inside the top cover, the fan being provided on the motor and directly or indirectly matching with the motor.

[0006] The fan is fixedly provided on the lower side of the motor, and the motor is interposed between the air outlet and the fan.

[0007] The fan is a backward centrifugal fan.

[0008] An air rectifying passage is provided between the fan and the air inlet.

[0009] At least one of the following air handling devices is provided between the fan and the air inlet: an air purifying device, an air dehumidifying device, and an air humidifying device.

[0010] The air handling system further comprises a base provided at the bottom of the air handling system, an air duct being provided between the air inlet and the air outlet, which penetrates through the top cover, the air handling device and the base, and an air purifying agent bearing part being provided in the air duct.

[0011] A guide vane is provided at the air outlet, and the air purifying agent bearing part is provided on the guide vane.

[0012] The air purifying agent bearing part is a flavouring agent bearing part.

[0013] The air inlet is a semi-annular air inlet.

[0014] The air handling system provided in the present invention reduces the turbulence of the gas entering the air inlet by increasing the distance between the air inlet and the fan and by adding an air rectifying passage, so that the air flow is adjusted in a sufficient space to reduce the noise and increase the utilization of the gas entering the air inlet, and the air handling system is simple in operation and convenient to use.

Brief Description of the Drawings

[0015] The accompany drawings constituting part of the present invention are used to provide a further understanding of the present invention; and exemplary embodiments and illustrations thereof of the present invention are used to explain the present invention, and do not unduly limit the present invention. In the drawings:

Fig. 1 is a structural schematic view of an air handling system provided in the present invention; and

Fig. 2 is a partial schematic view of a top cover of the air handling system provided in the present invention.

Detailed Description of the Invention

[0016] The following description and the accompany drawings fully illustrate specific embodiments of the present invention so as to enable those skilled in the art to practice the same. Other embodiments may include structural, logical, electrical, procedural, and other changes. The embodiments represent only possible variations. Individual components and functions are optional, and the order of operations may vary, unless explicitly required. Portions and features of some embodiments may be included in or replace portions and features of other embodiments. The scope of the embodiments of the present invention encompasses the full scope of the claims, and all available equivalents of the claims. In this context, these embodiments of the present invention may be individually or collectively referred to by the term "invention" for convenience only, and if in fact more than one invention is disclosed, it is not intended to automatically limit that the application is within the scope of any single inventive or inventive concept.

[0017] An air handling system of the present invention as shown in Fig. 1 comprises a top cover 1, a fan 2, an air inlet 3 and an air outlet 4, wherein the air inlet 3 is provided at the bottom of the air handling system, the air outlet 4 is provided at the top of the top cover 1, and the fan 2 is provided inside the top cover 1 and is close to the air outlet 4.

[0018] When the air handling system is in operation, the power source is turned on, so that the motor 5 drives the fan 2 to rotate, and the fan 2 rotates to generate a suction force so that the air is sucked from the air inlet 3, and the air sucked from the air inlet 3 is fully utilized, and the air is then blown out from the air outlet 4 by means of the fan 2.

[0019] Preferably, as shown in Fig. 2, the air handling system further comprises a motor 5 provided inside the top cover 1, the fan 2 being provided on the motor 5 and directly or indirectly matching with the motor 5.

[0020] The air sucked from the air inlet 3 passes through the fan 2 without being obstructed. The fan 2 is fixedly provided on the lower side of the motor 5, and the motor 5 is interposed between the air outlet 4 and the fan 2.

[0021] Preferably, the fan 2 is a backward centrifugal fan.

[0022] An air rectifying passage 6 is provided between the fan 2 and the air inlet 3.

[0023] Preferably, at least one of the following air handling devices is provided between the fan 2 and the air inlet 3: an air purifying device, an air dehumidifying device, and an air humidifying device. The air sucked through the fan 2 is rectified by at least one of the air purifying device, the air dehumidifying device, the air humidifying device and the like through an air rectifying passage 6, thereby reducing the noise.

[0024] Preferably, the air handling system further comprises a base 7 provided at the bottom of the air handling system, an air duct being provided between the air inlet 3 and the air outlet 4, which penetrates through the top cover 1, the air handling device and the base 7, and an air purifying agent bearing part being provided in the air duct.

[0025] Preferably, a guide vane is provided at the air outlet 4, and the air purifying agent bearing part is provided on the guide vane.

[0026] Preferably, the air purifying agent bearing part is a flavouring agent bearing part.

[0027] An air purifying agent bearing part is provided in the air duct inside the air handling system, which can purify and sterilize the air entering the air handling system, and an additive such as a flavoring agent can also be placed on the air purifying agent bearing part to flavor the air, thereby not only purifying the air but also improving the lifestyle.

[0028] In some illustrative embodiments, the air handling system further comprises one or more air handling devices provided on the lower side of the top cover 1. The top cover 1 comprises a top cover air inlet, an air outlet 4, and a power-supply input structure for receiving the power supplied from the adjacent air handling device. The power-supply input structure is provided on the bottom surface of top cover 1. The power-supply input structure is specified as a top cover 1 power source mating interface. The air handling system may further comprise a top cover 1 communication mating interface provided on the bottom surface of the top cover 1 for communication connection. Of course, the top cover 1 power source mating interface and the top cover 1 communication mating interface may be integrated into one interface. The top cover 1 power source mating interface and the top cover 1 communication mating interface employ the structure of the first terminal block or the second terminal block of the connector as described above. The top cover 1 is further provided with a top cover 1 magnet and a guide post on the bottom surface thereof. The top cover 1 magnet is the aforementioned magnetic component, and the guide post is of the aforementioned guide post structure.

[0029] In some illustrative embodiments, a side wall of the top cover 1 comprises an inner wall and an outer wall, and a spacing is provided between the inner wall and the outer wall. The top cover 1 is further provided with a detection unit. The detection unit comprises a detection air inlet 3, a top cover air inlet, a detection air outlet 4, a detection fan and sensors. The detection air inlet 3 and the detection air outlet 4 are respectively provided on the surface of the outer wall of the top cover 1. The detection fan and the sensors are provided in the spacing between the detection air inlet 3 and the detection air outlet 4. In this embodiment, the sensors comprise a VOC (volatile organic compounds) sensor, a PM detection device, temperature and humidity sensors, and the like. It should be understood that the present invention is not limited to this, and the sensors may be other types of sensors for detecting air indicators. In some illustrative embodiments, the quality of the air can be detected by using the detection unit.

[0030] In some illustrative embodiments, a protrusion is provided on the top surface of the top cover 1, and a display screen is provided on the surface of the protrusion. The display screen serves as a human-computer interaction interface for displaying the current operating state, the operation being performed by the user, and the like. The outer periphery of the display screen is provided with a circular indicator lamp strip, which may serve as an indication of machine operation, stop, or malfunction. The indicator lamp strip can also be used to indicate air quality, for example, different colours of the indicator lamp strip represent different air quality levels.

[0031] In addition to the basic controls, the top cover can also be equipped with an infrared transceiver for controlling other household appliances in some illustrative embodiments.

[0032] The air inlet is a semi-circular air inlet, which increases the air inletting volume and thus increases the efficiency of the air handling system.

[0033] While the foregoing is only preferred embodiments of the present invention, it should be noted that modifications and adaptations may be made by those skilled in the art without departing from the principles of the present invention, and should be considered to be within the scope of protection of the present invention.

Claims

1. An air handling system, comprising a top cover, a fan, an air inlet and an air outlet of the air handling system, **characterized in that** the air inlet is provided at a lower portion of the air handling system, the

air outlet is provided at the top of the top cover, and the fan is provided inside the top cover and is close to the air outlet.

2. The air handling system according to claim 1, **characterized by** further comprising a motor provided inside the top cover, the fan being provided on the motor and directly or indirectly matching with the motor.

3. The air handling system according to claim 2, **characterized in that** the fan is fixedly provided on the lower side of the motor, and the motor is interposed between the air outlet and the fan.

4. The air handling system according to claim 3, **characterized in that** the fan is a backward centrifugal fan.

5. The air handling system according to claim 1, **characterized in that** an air rectifying passage is provided between the fan and the air inlet.

6. The air handling system according to claim 5, **characterized in that** at least one of the following air handling devices is provided between the fan and the air inlet: an air purifying device, an air dehumidifying device, and an air humidifying device.

7. The air handling system according to claim 6, **characterized by** further comprising a base provided at the bottom of the air handling system, an air duct being provided between the air inlet and the air outlet, which penetrates through the top cover, the air handling device and the base, and an air purifying agent bearing part being provided in the air duct.

8. The air handling system according to claim 7, **characterized in that** a guide vane is provided at the air outlet, and the air purifying agent bearing part is provided on the guide vane.

9. The air handling system according to claim 8, **characterized in that** the air purifying agent bearing part is a flavouring agent bearing part.

10. The air handling system according to any one of claims 1-9, **characterized in that** the air inlet is a semi-annular air inlet.

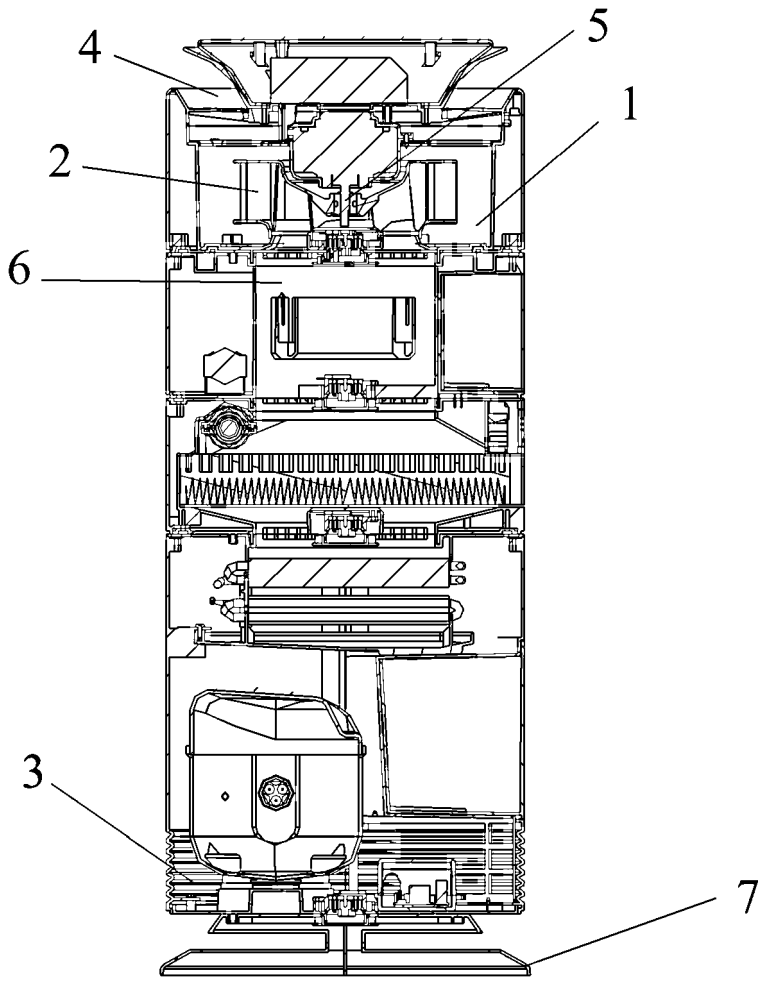

Fig. 1

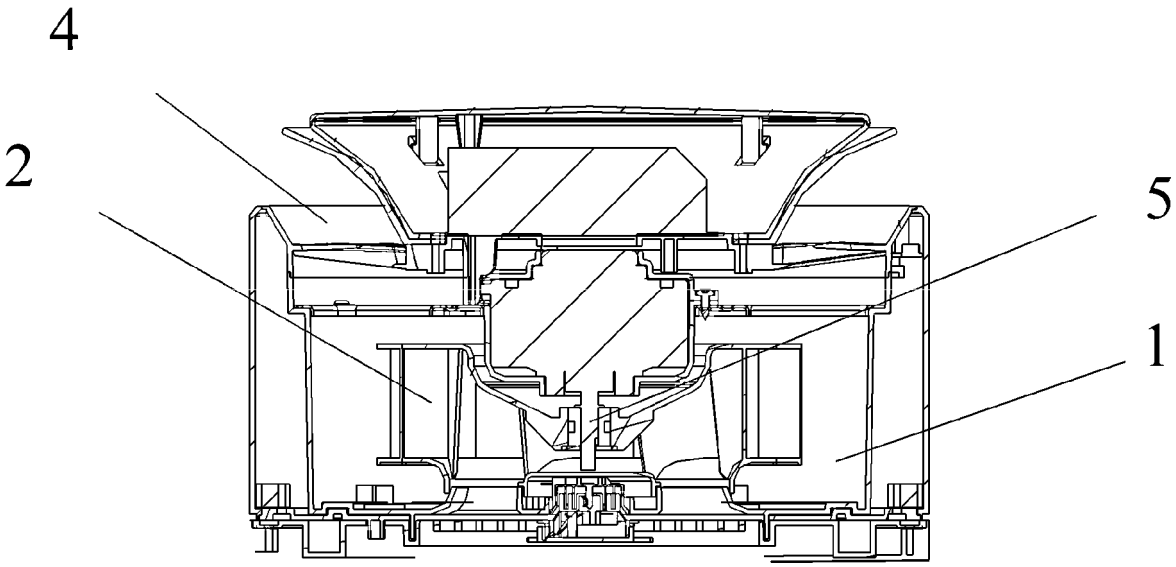

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2014/093271

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/02 (2011.01) 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; B01D

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)

CNPAT, CNKI, WPI, EPODOC: air treatment, air conditioning, purify, humidify, dehumidify, head cover, exhaust air, outlet air, air, clean, humid, dehumid, treat, top, upper, discharge, exhaust, blowout, outlet, fan, blower, wheel

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2014020707 A (PANASONIC CORP.), 03 February 2014 (03.02.2014), description, paragraphs 0013-0047, and figures 1-7	1-8, 10
Y	JP 2014020707 A (PANASONIC CORP.), 03 February 2014 (03.02.2014), description, paragraphs 0013-0047, and figures 1-7	9
Y	CN 2427767 Y (GUANGHONG ENTERPRISE CO., LTD.), 25 April 2001 (25.04.2001), description, page 2, paragraph 5, and figures 1-3	9
X	W0 2008019686 A1 (MUNTERS AS et al.), 21 February 2008 (21.02.2008), description, page 3, the last paragraph to page 5, the last paragraph, and figure 1	1-8, 10
Y	WO 2008019686 A1 (MUNTERS AS et al.)21 February 2008 (21.02.2008), description, page 3, the last paragraph to page 5, the last paragraph, and figure 1	9
X	CN 2170798 Y (DU, Jiazhong), 06 July 1994 (06.07.1994), description, page 3, the last paragraph to page 4, the last paragraph, and figures 1 and 2	1-6, 10
X	CN 2268218 Y (YANG, Jinghui et al.), 19 November 1997 (19.11.1997), description, page 1, the last paragraph to page 2, the last paragraph, and figure 1	1, 10

☒ 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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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
13 February 2015 (13.02.2015)	**13 March 2015 (13.03.2015)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **HUO, Fang** Telephone No.: (86-10) **62084833**

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2014/093271

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 2679567 Y (GUANGDONG MIDEA GROUP CO., LTD.), 16 February 2005 (16.02.2005), the whole document	1-10
A	US 5616172 A (NATURE'S QUARTERS INC.), 01 April 1997 (01.04.1997), the whole document	1-10
E	CN 204006377 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 10 December 2014 (10.12.2014), the whole document	1-6
E	CN 204084620 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 07 January 2015 (07.01.2015), the whole document	1-6
E	CN 204006475 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 10 December 2014 (10.12.2014), the whole document	1-6
E	CN 204006376 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 10 December 2014 (10.12.2014), the whole document	1-6
E	CN 204006375 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 10 December 2014 (10.12.2014), the whole document	1-6
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E	CN 104197427 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 10 December 2014 (10.12.2014), the whole document	1-6

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2014/093271

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
JP 2014020707 A	03 February 2014	None	
CN 2427767 Y	25 April 2001	None	
WO 2008019686 A1	21 February 2008	DK 200601054 A	15 February 2008
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CN 204084620 U	07 January 2015	None	
CN 204006475 U	10 December 2014	None	
CN 204006376 U	10 December 2014	None	
CN 204006375 U	10 December 2014	None	
CN 204063427 U	31 December 2014	None	
CN 104197427 A	10 December 2014	None	

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