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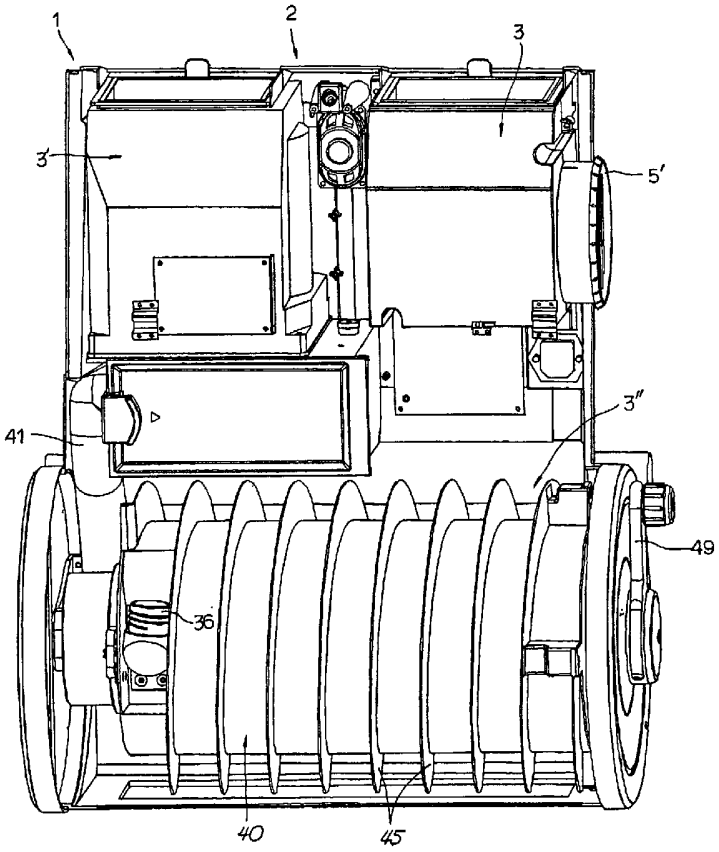
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(54) Title: CENTRAL VACUUM CLEANER WITH HUMIDIFYING AND AIRCLEANING FUNCTIONS



(57) Abstract: The object of this invention is to provide a central vacuum cleaner which has a humidifying unit, an air-cleaning unit,and a vacuum cleaning unit. A hose storge spool is provided at a lower portion of the casing to wind or unwind a flexible hose of the vacuum cleaning unit. In the central vacuum cleaner, the casing (1) has a structure to stand upright on a support surface or to be hung on a wall, while the humidifying unit (10) has a transparent water container (11) which is detachably installed in a depressed seat (2) provided on the casing. The depressed seat has a lamp window (16). The air-cleaning unit (20) is installed in the casing to clean air while circulating the air. The vacuum cleaning unit (30) is installed in the casing and has the hose which is wound on or unwound from the hose storage spool.

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CENTRAL VACUUM CLEANER WITH HUMIDIFYING AND AIR-CLEANING FUNCTIONS

Technical Field

The present invention relates, in general, to central vacuum cleaners with humidifying and air-cleaning functions and, more particularly, to a central vacuum cleaner which has a vacuum cleaning unit, a humidifying unit, and an air-cleaning unit within a single casing, with a hose storage spool provided at a lower portion of the casing to wind or unwind a flexible hose, and which may stand on a support surface or may be hung on a wall when it is used as a humidifier or an air cleaner, and which is thus conveniently used.

Background Art

As well known to those skilled in the art, a humidifier, an air cleaner and a vacuum cleaner are marketed as separate machines, so that users are forced to purchase the humidifier, the air cleaner and the vacuum cleaner separately. The conventional humidifier, the air cleaner and the vacuum cleaner thus force excessive costs on the users, and, furthermore, require excessive space since they must be stored separately in a room. The conventional humidifier, the air cleaner and the vacuum cleaner are also inconvenient to users who separately manage them.

In an effort to overcome the problems experienced in the conventional humidifiers, air cleaners and vacuum cleaners, a vacuum cleaner with a humidifying function and an air-cleaning function has been proposed and used.

An example of such conventional vacuum cleaners with humidifying and air-cleaning functions is referred to in Korean Patent Application No. 2002-0010101, entitled "central vacuum cleaner with humidifying function and air-cleaning function" and filed by the inventor of the present invention. However,

the central vacuum cleaner with humidifying function and air-cleaning function has problems in its construction and operation, so that it is necessary to improve the construction and operation of the central vacuum cleaner with humidifying function and air-cleaning function.

Disclosure of the Invention

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and provides a central vacuum cleaner with a humidifying function and an air-cleaning function, which is improved in its construction and operational effect in comparison with the central vacuum cleaner disclosed in Korean Patent Application No. 2002-0010101.

It is an object of the present invention to provide a central vacuum cleaner, which has a humidifying unit comprised of a transparent water container with a bubbling unit installed in the water container, an air-cleaning unit to clean room air while circulating the room air, and a hose storage spool provided at a lower portion of a casing to wind or unwind a flexible hose, and which may stand on a support surface or may be hung on a wall when it is used as a humidifier or an air cleaner, thus being safely and conveniently used by a user.

In order to accomplish the above object, the present invention provides a central vacuum cleaner, comprising: a casing having a structure to stand upright on a support surface or to be hung on a wall; a humidifying unit having a transparent water container which has a bubbling unit therein and is detachably installed in a depressed seat provided on the casing, the depressed seat having a lamp window; an air-cleaning unit installed in the casing to clean air while circulating the air; and a vacuum cleaning unit installed in the casing and having a hose which is wound on or unwound from a hose storage spool unit, the hose storage spool unit being rotated in opposite directions. A user thus safely and conveniently uses the central vacuum cleaner.

Brief Description of the Drawings

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a central vacuum cleaner, according to an embodiment of the present invention;

FIG. 2 is a plan view of the central vacuum cleaner of FIG. 1, when a top cover is removed from a casing of the vacuum cleaner to show partitioned sections and a hose storage spool unit provided in the casing;

FIG. 3a is an exploded perspective view of a humidifying unit included in the central vacuum cleaner of FIG. 1;

FIG. 3b is a perspective view of the central vacuum cleaner of FIG. 1 to show a humidifier seat which holds the humidifying unit therein;

FIG. 4 is an exploded perspective view of a vacuum cleaning unit included in the central vacuum cleaner of FIG. 1;

FIG. 5 is an exploded perspective view of the hose storage spool unit on which a flexible hose used with the vacuum cleaning unit of FIG. 4 is wound; and

FIG. 6 is an exploded perspective view of an air-cleaning unit included in the central vacuum cleaner of FIG. 1.

Best Mode for Carrying Out the Invention

Reference should now be made to the drawings, in which the same reference numerals are used throughout the different drawings to designate the same or similar components.

FIG. 1 is a perspective view of a central vacuum cleaner, according to an embodiment of the present invention. FIG. 2 is a plan view of the vacuum cleaner, when a top cover is removed from a casing of the vacuum cleaner to show partitioned sections and a hose storage spool unit provided in the casing.

FIG. 3a is an exploded perspective view of a humidifying unit included in the vacuum cleaner. FIG. 3b is a perspective view of the vacuum cleaner to show a humidifier seat which holds the humidifying unit therein. FIG. 4 is an exploded perspective view of a vacuum cleaning unit included in the vacuum cleaner. FIG. 5 is an exploded perspective view of the hose storage spool unit on which a flexible hose is wound. FIG. 6 is an exploded perspective view of an air-cleaning unit included in the vacuum cleaner.

As shown in the drawings, the central vacuum cleaner of the present invention comprises a casing 1 which defines an appearance of a body of the vacuum cleaner. The casing 1 is designed to stand upright on a support surface or to be hung on a wall. The central vacuum cleaner also has a humidifying unit 10 with a transparent water container 11, which is detachably installed in a depressed seat 2 provided on the casing 1. As best seen in FIG. 3a, the transparent water container 11 includes a bubbling unit to produce air bubbles in water contained in the water container 11. The bubbling unit comprises a tube 13 and an air nozzle 12 connected to an end of the tube 13. The transparent water container 11 of the humidifying unit 10 is closed by a base cap 14 at a bottom thereof, with a slot 15 formed on an outer surface of each of two sidewalls of the base cap 14 to engage with a protrusion 6 formed on each sidewall of the depressed seat 2 of the casing 1. The transparent water container 11 of the humidifying unit 10 is thus detachably installed in the depressed seat 2 of the casing 1 by means of the detachable engagement of the slots 15 with the protrusions 6. The depressed seat 2 has a lamp window 16 at an end wall thereof, as shown in FIG. 3b. The central vacuum cleaner also has an air-cleaning unit 20 which is installed in a first section 3 inside the casing 1 to clean air while circulating the air. As best seen in FIG. 6, the air-cleaning unit 20 comprises a fan 21 and a fan motor 22 which are housed in a first noise attenuation box 23. The fan motor 22 operates the fan 21. The air-cleaning unit 20 also has an air suction part 4, an air filter (not shown), a stationary grille 5, and a movable grille 5'. The central vacuum cleaner also has a vacuum

cleaning unit 30 which is installed in a second section 3' inside the casing 1. The vacuum cleaning unit 30 comprises a vacuum box 32 which houses a dust bag 31 and a sterilizing lamp "L" therein, and a motor box 34 which houses a suction motor 33 therein. The vacuum box 32 and the motor box 34 are housed in a second noise attenuation box 34' which is installed in the second section 3' inside the casing 1. The vacuum cleaning unit 30 also has a functional filter 35, and communicates with the movable grille 5'. The central vacuum cleaner also has a hose storage spool unit 40 which is installed in a third section 3" provided at a lower portion of the casing 1. The hose storage spool unit 40 comprises two shaft brackets 42 securely mounted on opposite surfaces in the casing 1 to hold each end of a rotating shaft 44 by use of a bearing 43 and a bushing 43', with a spool axially fitted over the rotating shaft 44 to rotate in opposite directions along with the rotating shaft 44. The spool of the hose storage spool unit 40 is provided with a spiral hose guide wall 45 around its outer surface to guide a flexible hose 36 when winding or unwinding the hose 36 on or from the spool. The hose storage spool unit 40 also has a dust guide pipe 41 which is connected at a first end thereof to the dust bag 31 installed in the vacuum box 32, and is connected at a second end thereof to a rotary pulley 46 by way of a fixed drum 41', two ring terminals 46', and a frame terminal 46". At the rotary pulley 46, the dust guide pipe 41 is connected to the hose 36 which is mounted to the rotary pullet 46 by use of a mounting jack "J". The dust guide pipe 41 thus guides the air laden with dust from the hose 36 to the dust bag 31.

In the hose storage spool unit 40, four balance weights 48 are installed around the spool while being spaced apart from each other at regular angular intervals and being held by an end disc 47 which is mounted to the rotating shaft 44 at an end of the spool opposite to the rotary pulley 46. A handle 49 is mounted to the end of the rotating shaft 44 at a position outside the casing 1. Therefore, the hose 36 is wound on or unwound from the spool having the spiral hose guide wall 45 of the hose storage spool unit 40 in accordance with a manual rotating action of the handle 49.

In order to allow the casing 1 to be hung on a wall when necessary, the casing 1 has a hanging slot on a bottom wall thereof.

In the drawings, the reference numeral 37 denotes an anti-vibration cap, and the reference numeral 38 denotes a sealing door.

The central vacuum cleaner having the above-mentioned construction is operated as follows.

As described above, the central vacuum cleaner is used while standing upright on a support surface, or being hung on a wall by use of the hanging hole formed at the bottom wall of the casing 1. The humidifying unit 10 is detachably installed in the depressed seat 2 of the casing 1 by the engagement of the slots 15 formed on the sidewalls of the base cap 14 with the protrusions 6 formed on the sidewalls of the depressed seat 2 of the casing 1. The bubbling unit of the humidifying unit 10, comprising the air nozzle 12 and the tube 13, produces air bubbles in water contained in the transparent water container 11. In addition, light is emitted from the lamp window 16 of the depressed seat 2 to the air bubbles produced in the water inside the transparent water container 11. The humidifying unit 10 thus accomplishes a decorative effect, in addition to a humidifying effect.

The air-cleaning unit 20, installed in the first section 3 inside the casing 1, is operated as follows. When the fan 21 housed in the first noise attenuation box 23 is operated by the fan motor 22, room air is drawn into the casing through the air suction part 4 and the air filter (not shown), thus being filtered and cleaned prior to being discharged into the room through the stationary grille 5 and the movable grille 5'.

In such a case, the movable grille 5' is provided with movable air guide blades to allow a user to manually move the movable air guide blades so as to change the air discharging direction.

In order to use the vacuum cleaning unit 30 installed in the second section 3' inside the casing 1 to clean a room, the hose 36 is unwound from the spool of the hose storage spool unit 40, and the suction motor 33 mounted to the

anti-vibration cap 37 inside the motor box 34 is operated. When it is desired to clean a flat surface of the room by use of the vacuum cleaning unit 30, a suction nozzle (not shown) having a brush is mounted to the end of the hose 36 to receive air laden with dust from the flat surface.

During the vacuum cleaning process by use of the vacuum cleaning unit 30, the air laden with dust passes the suction nozzle, the hose 36, the rotary pulley 46, the frame terminal 46", the fixed drum 41', and the dust guide pipe 41 so as to reach the dust bag 31 installed in the vacuum box 32. The air laden with dust is thus filtered by the dust bag 31, and is sterilized by the sterilizing lamp "L", so that the sterilized air free from dust is discharged to the room while passing the functional filter 35 of the noise attenuation box 34' and the movable grille 5'.

The dust bag 31 collecting a predetermined amount of dust may be emptied or changed with a new one, when necessary.

After the vacuum cleaning process is finished, the suction nozzle having the brush is removed from the end of the hose 36 so as to be stored separate from the vacuum cleaner. The hose 36 is automatically or manually wound on the spool of the hose storage spool unit 40. In such a case, the automatic winding of the hose 36 on the spool is accomplished by an operation of a switch (not shown), while the manual winding of the hose 36 on the spool is accomplished by a rotation of the handle 49. When the spool having the spiral hose guide wall 45 rotates along with the rotating shaft 44 as described above, the spool stably rotates due to the balance weights 48, so that the hose 36 is evenly wound on the spool.

Industrial Applicability

As described above, the present invention provides a central vacuum cleaner, which has a humidifying unit, an air-cleaning unit, and a vacuum cleaning unit installed in a single casing to accomplish compactness. The casing of the central vacuum cleaner may stand on a support surface or may be hung on

a wall when it is used as a humidifier or an air cleaner, so that the vacuum cleaner is conveniently used as the humidifier or the air cleaner.

The central vacuum cleaner effectively collects dust from the room air, controls humidity of the room air, cleans the room air, and combines the humidifying function, the air-cleaning function, and the vacuum cleaning function within the single casing, so that the user effectively and conveniently uses the central vacuum cleaner as a humidifier or an air cleaner, as desired.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A central vacuum cleaner, comprising:

a casing having a structure to stand upright on a support surface or to be hung on a wall;

a humidifying unit having a transparent water container which is detachably installed in a depressed seat provided on the casing, the depressed seat having a lamp window;

an air-cleaning unit installed in the casing to clean air while circulating the air; and

a vacuum cleaning unit installed in the casing and having a hose which is wound on or unwound from a hose storage spool unit, the hose storage spool unit being rotated in opposite directions.

2. The central vacuum cleaner according to claim 1, wherein the transparent water container of the humidifying unit is closed by a base cap at a bottom thereof and has a bubbling unit therein, with a slot formed on an outer surface of each of two sidewalls of the base cap to engage with a protrusion formed on each sidewall of the depressed seat of the casing, so that the transparent water container of the humidifying unit is detachably installed in the depressed seat of the casing.

3. The central vacuum cleaner according to claim 1, wherein the hose storage spool unit comprises:

a spool to wind or unwind the hose;

a rotating shaft axially assembled with the spool to rotate the spool; and

four balance weights installed on the spool while being held by an end disc which is mounted to the rotating shaft at an end of the spool,

whereby the spool is stably rotated along with the four balance weights and the end disc.

4. The central vacuum cleaner according to claim 1, wherein the vacuum cleaning unit comprises:

a vacuum box installed in the casing; and

a sterilizing lamp provided at a side of the vacuum box to sterilize dust collected in a dust bag installed in the vacuum cleaning unit.

FIG. 1

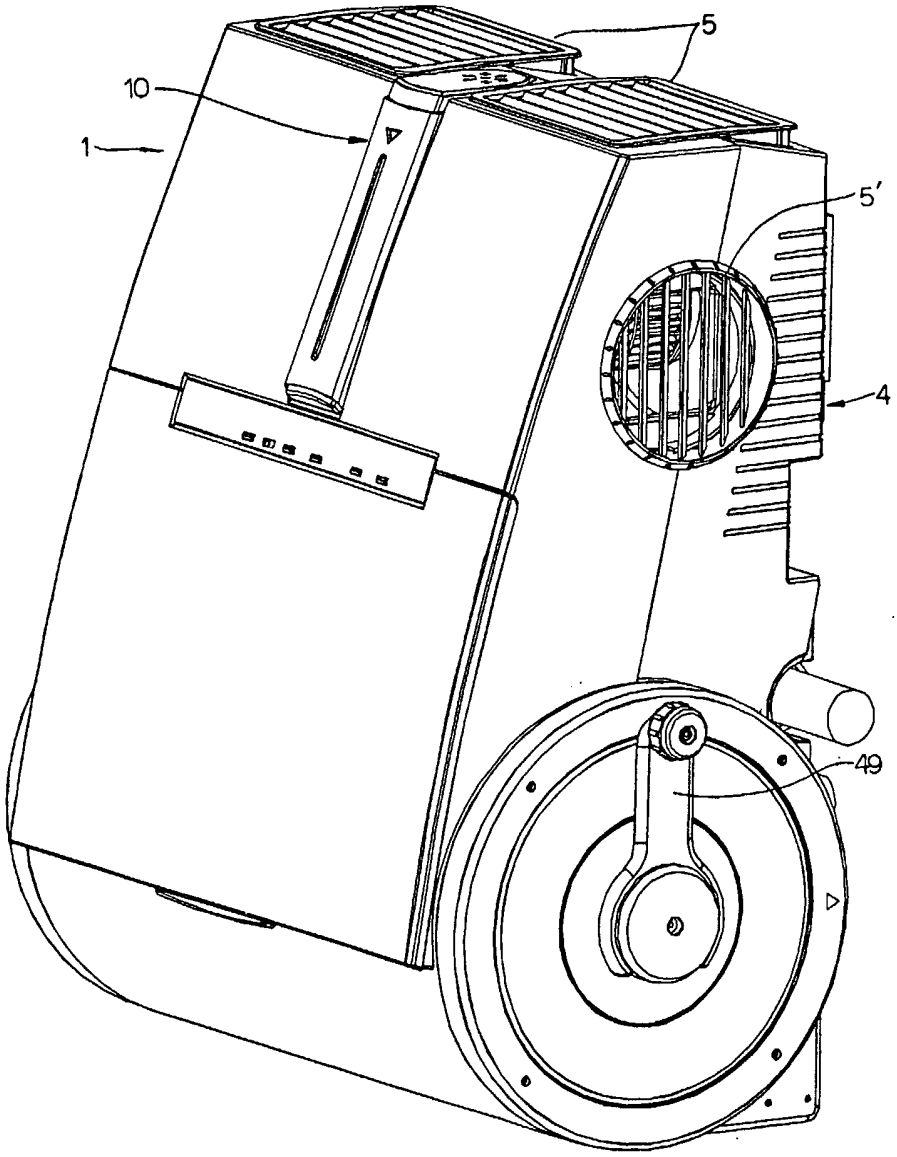


FIG. 2

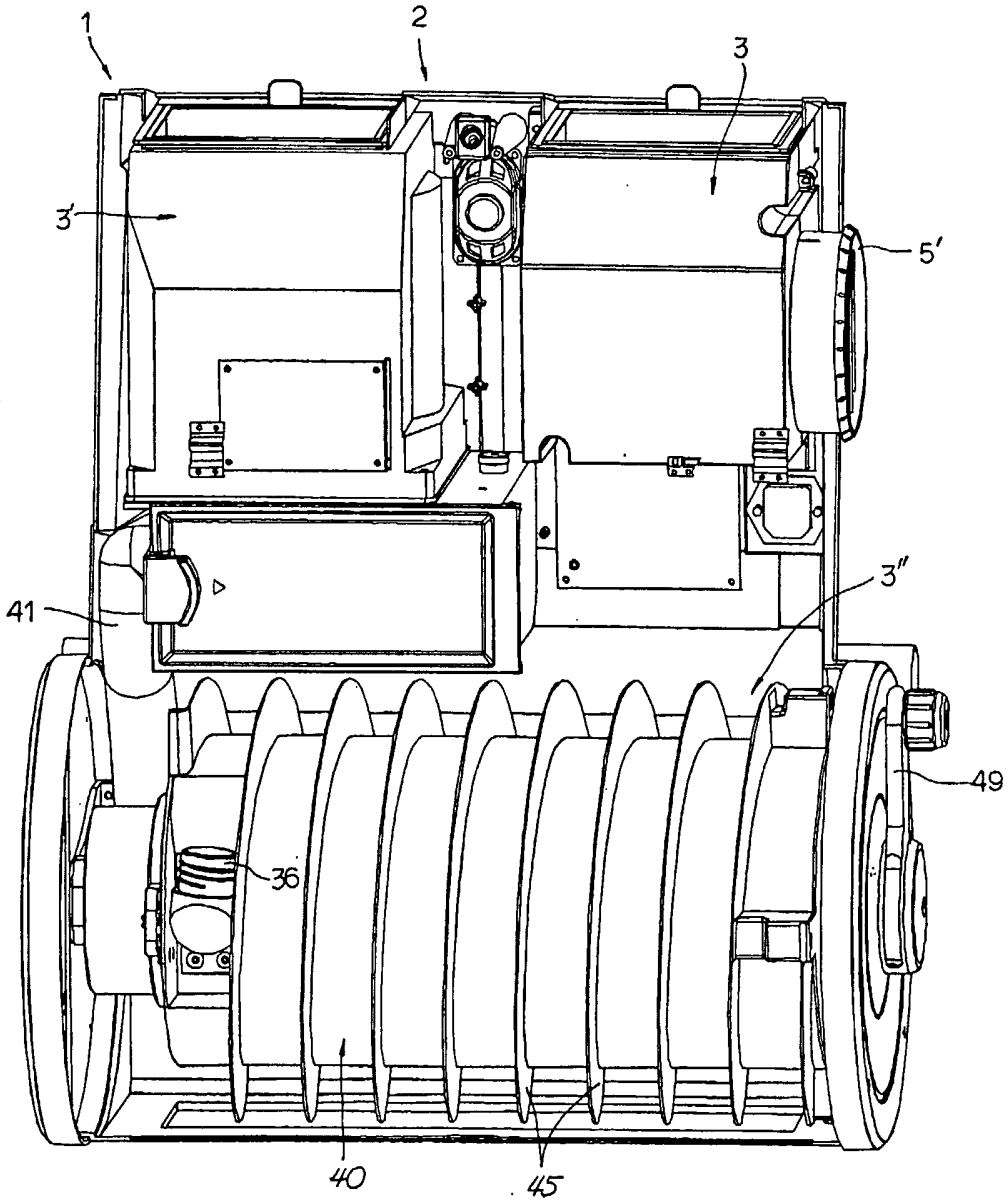


FIG. 3a

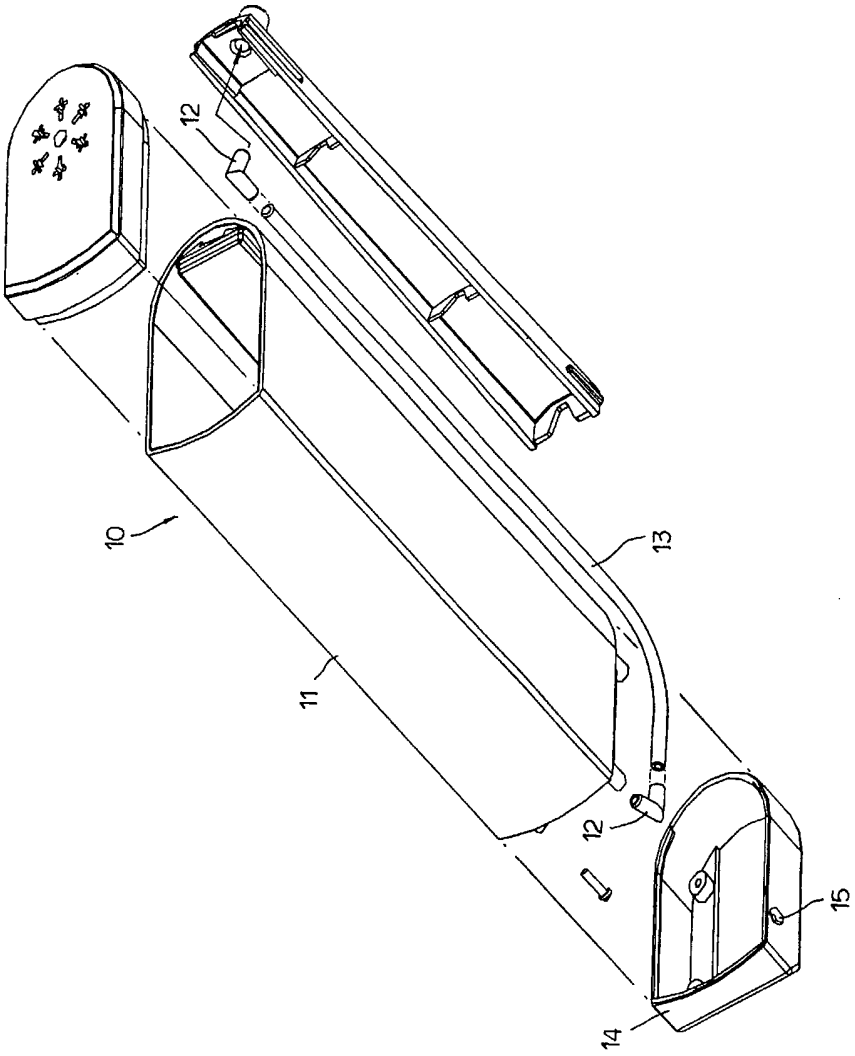


FIG. 3b

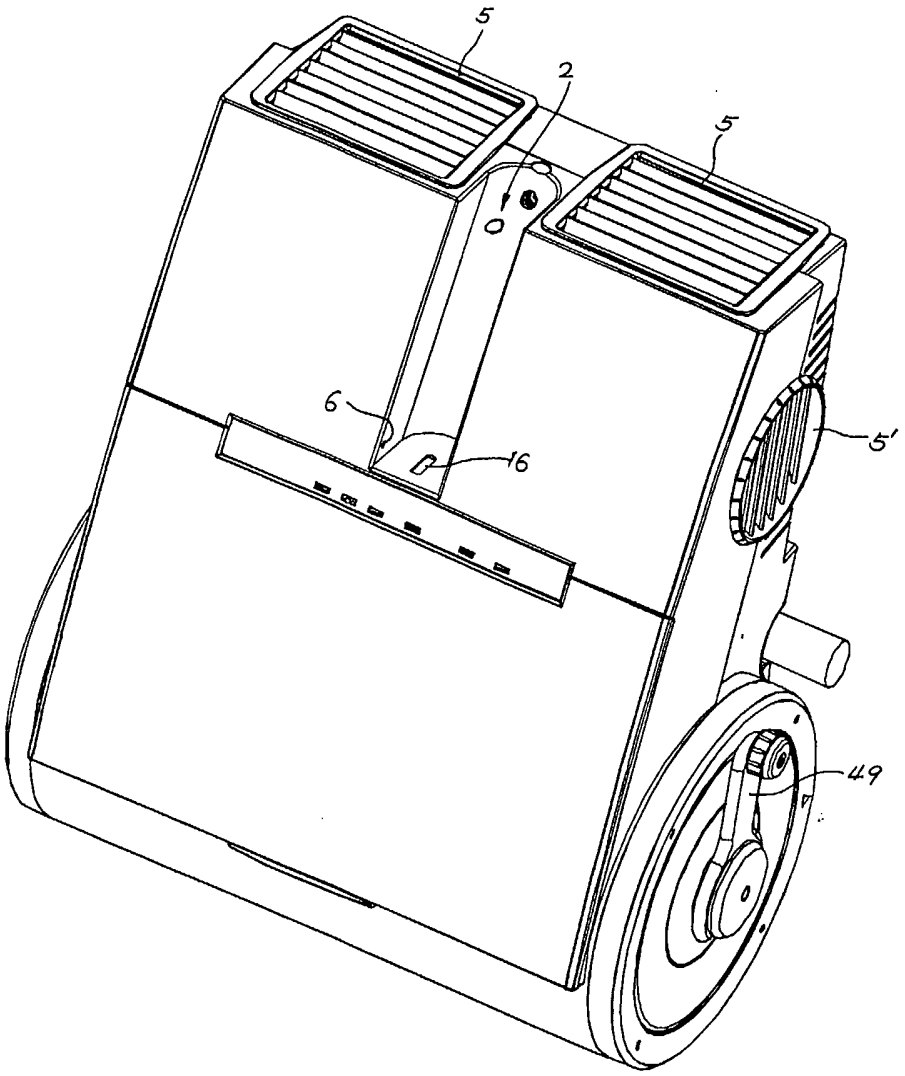
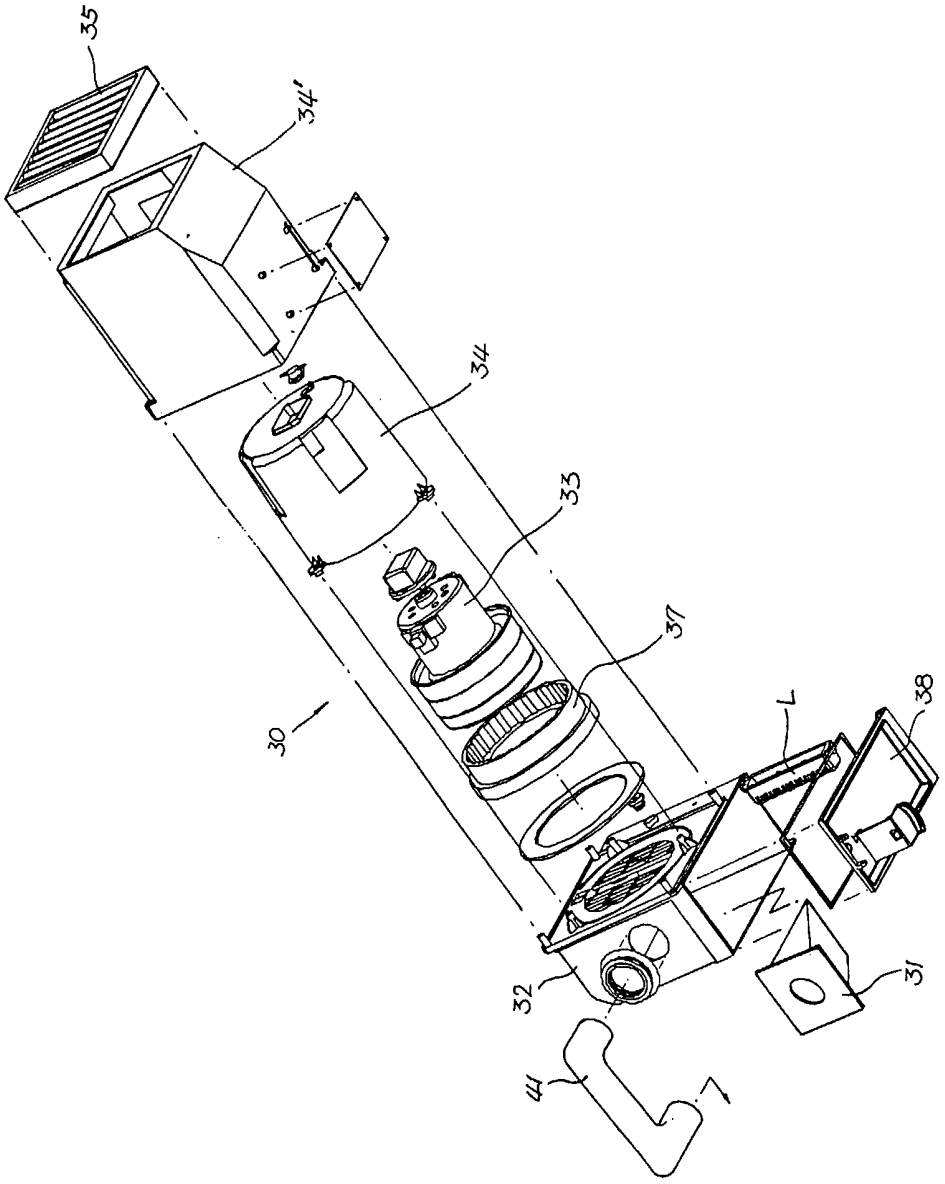


FIG. 4



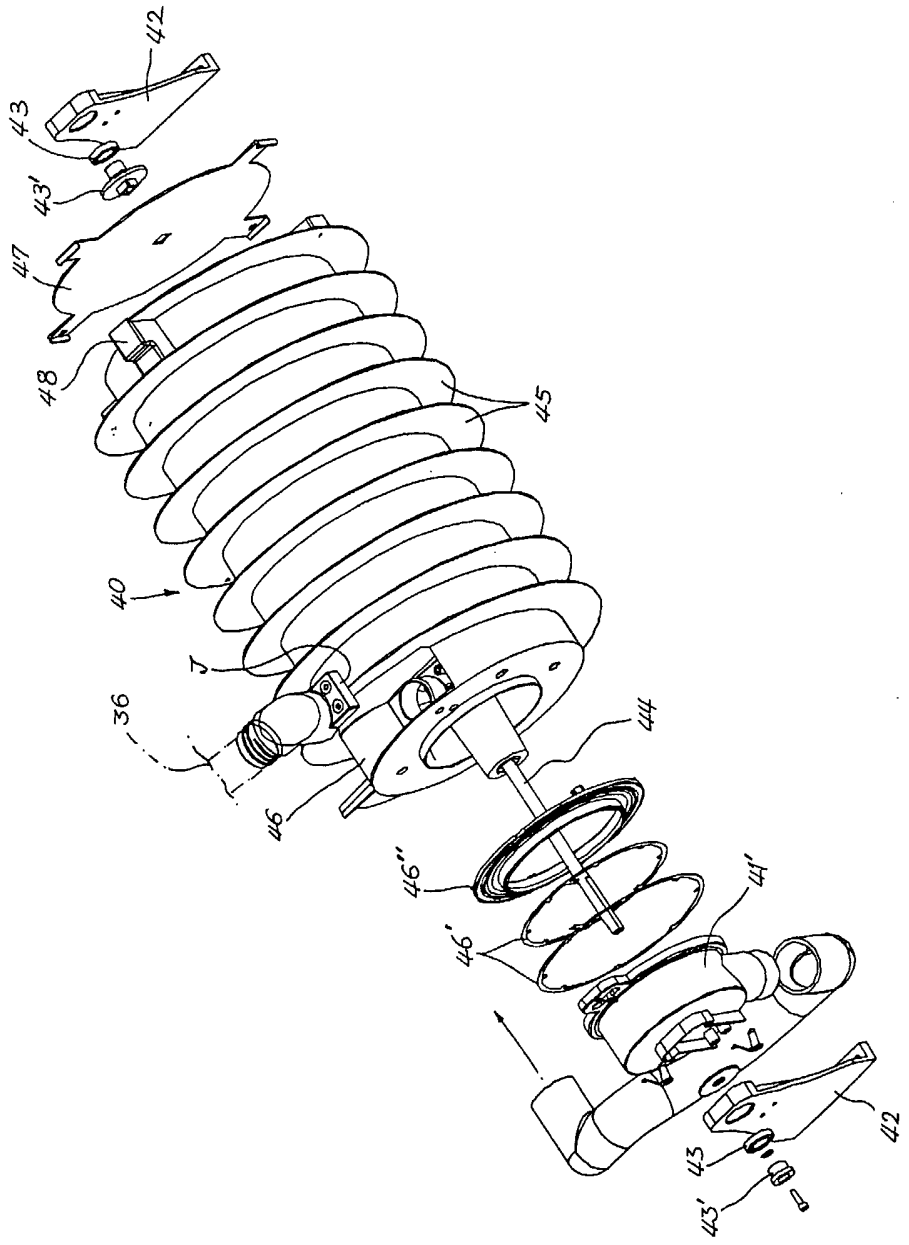
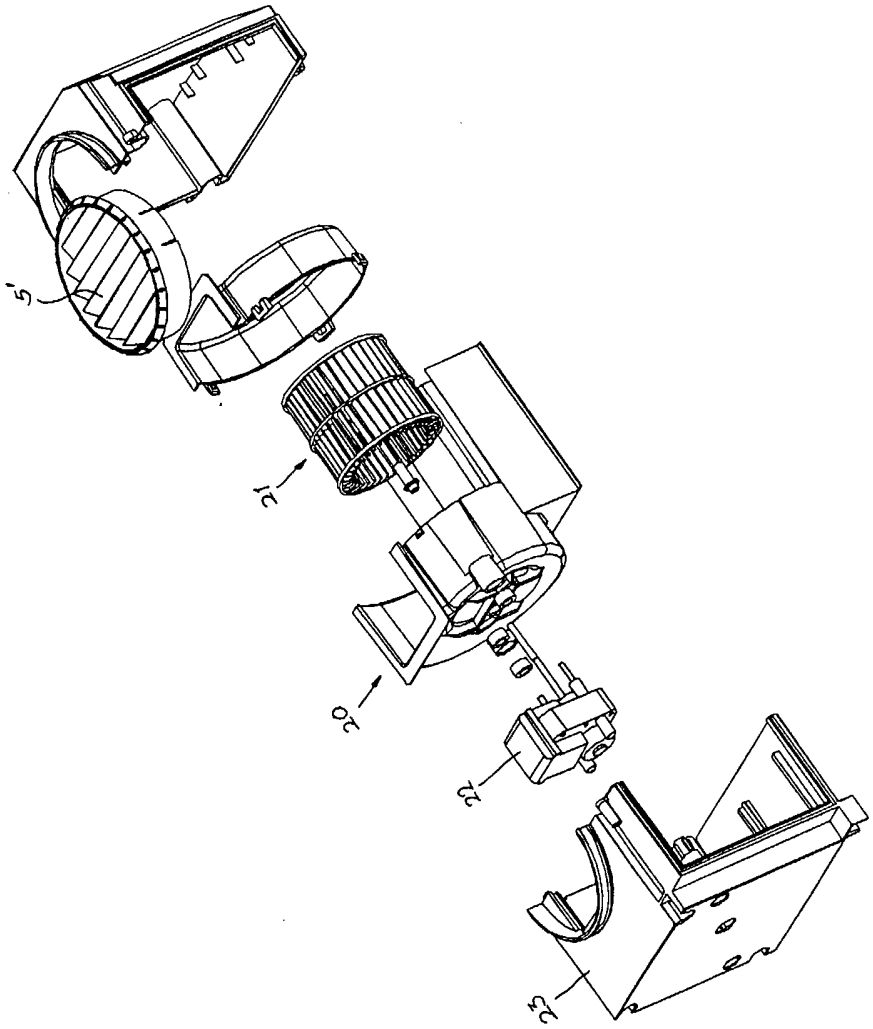


FIG. 5

FIG. 6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR03/01224

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A47L 7/00

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)

IPC7 A47L*

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and applications for inventions since 1975, Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-2219 U(Electronic Vacuum Cleaner with air cleaning function, TEC Corp.) Jun.16, 1998	1 to 3
A	KR 2001-76699 A(Up-right Type Vacuum Cleaner, LG Elcetronics) Aug. 16, 2001	1
A	KR 1999-61568 A(Vacuum Cleaner with an Ultraviolet Lamp, Samsung Kwangju Corp.) Jul. 26, 1999	4
A	KR 1990-269 U(Sterilization Apparatus for a Vacuum Cleaner, Kumsung Co.) Jan. 17, 1990	4

☐ 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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"P" document published prior to the international filing date but later than the priority date claimed
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"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
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Date of the actual completion of the international search	Date of mailing of the international search report
11 NOVEMBER 2003 (11.11.2003)	11 NOVEMBER 2003 (11.11.2003)

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