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(54) Title: A CLEANING ASSEMBLY FOR A FAN

(57) Abstract: The present disclosure relates to a cleaning assembly (100) for a fan (200) to facilitate selfcleaning. The cleaning assembly (100) comprises a bristle assembly (102) mounted adjacent to blades of the fan. The bristle assembly includes a hub (10), a bristle holder (20) and a plurality of bristles (22). The hub has a provision (12) to receive and mount over a motor shaft (202) coupled to the blades (206). The bristle holder (20) extends around in a radially spaced position relative to the hub and the plurality of bristles is supported and disposed about a periphery of the bristle holder. The bristle assembly is configured to rotate at a speed less than a speed of the blades. The plurality of bristles is structured to contact the blades to clean the fan (200).

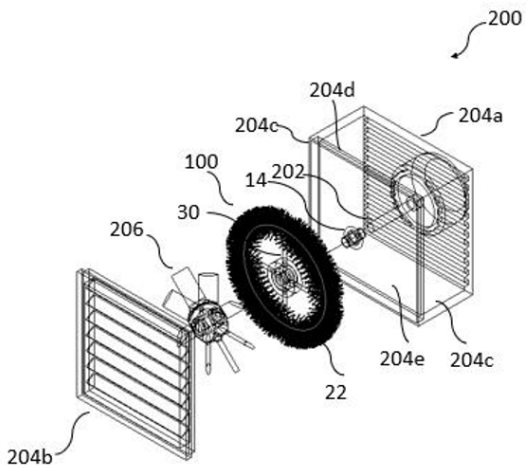

Fig. 1

FORM 2

THE PATENTS ACT 1970
(39 OF 1970)
&
The Patent Rules, 2003

Complete Specification

(See Section 10 and Rule 13)

1. TITLE OF THE INVENTION

A CLEANING ASSEMBLY FOR A FAN

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification describes the invention and the manner in which it is to be performed

DESCRIPTION

TECHNICAL FIELD

The present disclosure generally relates to the field of ventilation systems. Particularly but not exclusively the present disclosure relates to fan. Further embodiments of the disclosure relate to a cleaning assembly for the fan including bristles assembly for self-cleaning.

BACKGROUND

Typically, a conventional domestic fan includes a set of blades or vanes mounted for rotation about an axis, and a drive apparatus for rotating the set of blades to generate an air flow. There are several types of fans such as ceiling fans, exhaust fans and the like, designed in different ways based on different areas of application. Usually, surfaces of blades of the fan will collect and accumulate dust over a period of time and it is necessary to wipe this dust off. Further, cleaning these surfaces is challenging. Generally, the fan blades are cleaned with a dry dust cloth, or a dust cloth coated with some liquid cleaning material. Moreover, usually the fans are located at elevated positions, thus reaching to a height of the blades for cleaning is unsafe.

Usually, there exists cleaning systems connected to the fan for cleaning the fan blades. However, these cleansing systems may comprise water spraying mechanisms that includes several components, thereby increasing weight of the existing fan and in turn affecting the performance of the fan. Moreover, such conventional cleaning system requires additional system to operate. The implementation of large number of components increases manufacturing and maintenance cost of the cleaning assembly and is not economically beneficial. Also, in some of the conventional techniques fan blades are surface treated and coated by distinct materials to be dust proof. But these coatings require specific combinations of materials which are applicable only for a specific material of the fan blades. This in turn increases the capital cost and limits the application of such surface treatments and coating to existing blades of the fan.

The present disclosure is directed to overcome one or more limitations stated above or any other limitations associated with the prior art.

SUMMARY OF THE DISCLOSURE

One or more shortcomings of existing cleaning systems for fan have been overcome, and additional advantages are provided through the structure as claimed in the present disclosure. Additional features and advantages are realized through the techniques of the present disclosure. Other embodiments and aspects of the disclosure are described in detail herein and are considered a part of the claimed disclosure.

A primary aim of the present disclosure is to provide a cleaning assembly for a fan to facilitate self-cleaning of blades .

Another aim of the present disclosure is to provide a cleaning assembly that eliminates accumulation of dust thereby, eliminating interval removal and manual cleaning of blades.

An aim of the present disclosure is to provide an economically beneficial cleaning assembly for existing fan.

The limitations of the prior arts are addressed to a great extent by a cleaning assembly for a fan, as disclosed in the present disclosure.

The cleaning assembly for a fan is disclosed. The cleaning assembly includes a bristle assembly mounted adjacent to blades of the fan. The bristle assembly includes a hub which is defined with a provision to receive and to be mounted over a motor shaft coupled to the blades of the fan. The assembly further includes a bristle holder extending around in a radially spaced position relative to the hub. Further, a plurality of bristles is supported and disposed about a periphery of the bristle holder. The bristle assembly is configured to rotate at a speed less than a speed of the blades. Further, the plurality of bristles is structured to contact the blades in order to clean the fan.

In an embodiment, the bristle assembly includes a plurality of rods extending radially between the hub and the bristle holder, supporting the bristle holder on the hub.

In an embodiment , diameter of the provision defined in the hub is larger than a diameter of the motor shaft defining a loose fit between the bristle assembly and the motor shaft.

In one non-limiting embodiment of the present disclosure, the bristle holder is made of a flexible material.

In one non-limiting embodiment of the present disclosure, the plurality of rods is made of a flexible material.

In one non-limiting embodiment of the present disclosure, the plurality of bristles is structured to makes a point contact with blades to clean the fan. In one non-limiting embodiment of the present disclosure, a fan comprises a housing defining a space. A motor is enclosed within the housing. A motor shaft extends from the motor. Further, a blade is rotatably coupled on the motor shaft. The fan also includes a cleaning assembly . The cleaning assembly includes a bristle assembly is rotatably mounted on the motor shaft defining a loose fit . Further, the bristle assembly is disposed at least at one of the distal or proximal end of the blade.

The cleaning assembly comprises a hub which is defined with a provision to receive and to be mounted over a motor shaft coupled to the blades of the fan. A bristle holder extends around in a radially in a spaced position relative to the hub. A plurality of bristles is supported and disposed about a periphery of the bristle holder. The bristle assembly is configured to rotate at a speed less than a speed of the blades. Also, the plurality of bristles is structured to contact the blades to clean the fan.

It is to be understood that the aspects and embodiments of the disclosure described above may be used in any combination with each other. Several of the aspects and embodiments may be combined together to form a further embodiment of the disclosure.

The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects and features described above, further aspects and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

The novel features and characteristic of the disclosure are set forth in the appended claims. The disclosure itself, however, as well as a mode of use, further objectives, and advantages thereof, will best be understood by reference to the following detailed description of an embodiment when read in conjunction with reference to the accompanying drawings wherein like reference numerals represent like elements and in which:

FIG.1 illustrates an exploded view of a fan comprising a cleaning assembly, in accordance with the embodiment of the present disclosure;

FIG. 2 illustrates a sectional view of the fan having the cleaning assembly of Fig. 1;

FIG. 3 illustrates a perspective view of cleaning assembly of FIG. 1; and

FIG. 4a and FIG. 4b illustrates a detailed sectional view of a bristle assembly and a bristle holder of the cleaning assembly of Fig. 1; and

FIG. 5 illustrates a perspective view of an embodiment of cleaning assembly of FIG. 1.

The figures depict embodiments of the disclosure for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the objective of the disclosure described herein.

DESCRIPTION

While the embodiments in the disclosure are subject to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the figures and will be described below. It should be understood, however, that it is not intended to limit the disclosure to the particular forms disclosed, but on the contrary, the disclosure is to cover all modifications, equivalents, and alternative falling within the scope of the disclosure.

It is to be noted that a person skilled in the art would be motivated from the present disclosure and modify construction of a cleaning assembly for a fan. However, such modifications should be construed within the scope of the disclosure. Accordingly, the drawings show only those specific details that are pertinent to understand the embodiments of the present disclosure, so as not to obscure the disclosure with details that will be readily apparent to those of ordinary skill in the art having benefit of the description herein.

The terms “comprises”, “comprising”, or any other variations thereof used in the disclosure, are intended to cover a non-exclusive inclusions, such that a system and method that comprises a list of components does not include only those components but may include other components not expressly listed or inherent to such system, method, or assembly, or device. In other words, one or more elements in a system or device proceeded by “comprises… a” does not, without more constraints, preclude the existence of other elements or additional elements in the system or device.

The present disclosure relates to a cleaning assembly for a fan to facilitate self-cleaning of blades of the fan. Typically, conventional cleaning systems includes large number of components and requires additional mechanism to operate. Thus, conventional cleaning systems lead to increase in manufacturing and maintenance cost which is not economically feasible. Accordingly, the present disclosure discloses a cleaning assembly for a fan. The cleaning assembly comprises a bristle assembly which is mounted adjacent to blades of fan. The bristle assembly is structured to rotate at a speed less than a speed of the blades for continuous cleaning of the blades, thereby eliminating manual cleaning.

The following paragraphs describe the present disclosure with reference to FIGs.1 to 5. In the figures, the same element or elements which have similar functions are indicated by the same reference signs.

Referring to **Figure 1** to **Figure 5** which are exemplary embodiments of the present disclosure illustrating a cleaning assembly (100) for a fan (200) that aids in continuous self-cleaning.

The cleaning assembly (100) includes a bristle assembly (102). The bristle assembly (102) is mounted adjacent to blades (206) of the fan (200). The bristle assembly (102) includes a hub (10) which is defined with a provision (12) to receive a motor shaft (202) of the fan (200). More specifically, the hub (10) having the provision (12) allows mounting over the motor shaft (202). The motor shaft (202) is in turn coupled to the blades (206) of the fan (200). In an embodiment, the hub (10) is defined with a tubular body which rotatably mounted on the motor shaft (202). Further, the provision (12) of the hub (10) is a through hole with a diameter which extends along a length of the hub (10). In an embodiment, diameter of the provision (12) is larger than a diameter of the motor shaft (202) to define a loose fit between the bristle assembly (102) and the motor shaft (202). Further, the hub (10) is mounted on the motor shaft (202) via a mounting means (14). In an embodiment, the mounting means (14) is a frictionless bearing.

The bristle assembly (102) further includes a bristle holder (20) which extends around and in a radially spaced position relative to the hub (10). The bristle holder is defined with a tubular body forming a closed loop. The diameter of the bristle holder (20) is larger than the diameter of the hub (10). Further, a plurality of rods (30) extends radially between the hub (10) and the bristle holder (20) to support the bristle holder (20) on the hub (10). Each of the plurality of rods (30) is defined with two ends, such that one end of the rod (30) is coupled to the hub (10) and the other end is coupled with the bristle holder (20) supporting the bristle holder (20)

relative to the hub (10). In an embodiment, the bristle holder (20) and the plurality of rods (30) are made of a flexible material. In an embodiment, the flexible material is at least one of plastic, composites, polyvinyl chloride, silicone, polyethylene, polyurethane, flexible metallic material and any other suitable material or combination thereof.

The bristle assembly (102) further comprises a plurality of bristles (22) that is supported and disposed about a periphery of the bristle holder (20).The plurality of bristles (22) is at least one of fixed or removably attached to the bristle holder (20). In an embodiment, the plurality of bristles (22) is secured within at least one provision (24) defined along a periphery of the bristle holder (20). The provision (24) is at least one of slit or groove defined along the periphery of bristle holder (20). Further, the plurality of bristles (22) may be provided along a rod-shaped member (26). The plurality of bristles (22) is provided about 360 degrees around the rod-shaped member (26).The rod-shaped member (26) may be made of non-metal, or other suitable material which supports the plurality of bristles (22). The provision (24) defined along the periphery of bristle holder (20) may securely accommodate the rod-shaped member (26) including the plurality of bristles (22).

In an embodiment, the plurality of bristles (22) may be rotary bristles that are disposed in spaced apart configuration from adjacent bristle of the plurality of bristles (22) along the periphery of the bristle holder (20) as shown in Figure 4. The plurality of bristles (22) may be manufactured of any flexible material. The plurality of bristles (22) is structured to make a point contact with blades (206) to clean the fan thereby causing minimum friction between the bristles and the blades (206). More specifically, bristle assembly (102) is disposed at least one of distal or proximal end of the blade (206). In a preferred embodiment, the bristle assembly (102) is disposed at both of the distal end and the proximal end of the blade (206). As the bristle assembly (102) is loose fit with the motor shaft (202), the bristle assembly (102) rotates at a speed less than a speed of the blades (206) of the fan (200). This enables the plurality of bristles (22) to contact the blades (206) and clean the fan (200).

In an embodiment, the bristle holder (20) and plurality of bristles (22) is made of flexible material rather than metal or any other hard materials, to provide frictionless contact of the bristles with the blades (206), thereby minimising damage to the blades (206). Further, the flexible material has improved life as it may sustain wear and tear and is less reactive to moisture or grease.

In an embodiment, the design of the structure and dimensions of the components of the cleaning assembly (100) such as the hub (10), bristle holder (20), plurality of bristles (22), etc., may be altered based on the requirements/application. More specifically, a length of the rods (30) and diameter of the bristle holder (20) and dimensions of the bristle assembly may be suitably altered to be mounted to different fans. Additionally, the cleaning assembly may be applicable as kit that can be used universally as a standard for existing fans.

The present disclosure also discloses a fan (200) with the cleaning assembly (100). The fan (200) includes a housing (204) defining a space. The housing (204) includes a back wall (204a), a front wall (204b), and a pair of sidewalls (204c). The back wall (204a), front wall (204b) and sidewalls (204c) are joined to form an enclosure having a bottom wall (204d) and a top wall (204e), as shown in FIG 1 and FIG 5. In an embodiment, the front wall (204b) is removably connected to the housing (204). The front wall (204b) is defined with multiple inlets opening through which air is drawn into the housing (104). A motor (208) is enclosed within the housing (204) such that a motor shaft (202) extends from the motor (208) into the space. Further, blades (206) are rotatably coupled on the motor shaft (202). The fan (200) also includes the cleaning assembly (100) that is rotatably mounted on the motor shaft (202). The bristle assembly (102) is rotatably mounted at both the distal end and proximal end of the blade (206) to enable complete cleaning of blades (206). Also, this allows cleaning of peripheral surfaces such as front wall (204b), and back wall (204a) as well as side walls (204c) and top and bottom walls (204d, 204e) of the housing (204). Furthermore, this arrangement of the bristle assembly (102) at both distal and proximal end minimizes formation of dust and grease within the housing (204). Further, the bristle assembly (102) of the cleaning assembly (100) includes a hub which is accommodated on the motor shaft (202) and is configured to rotate at a speed less than a speed of the blades (206). The diameter of the provision (12) is defined in the hub (10) is larger than a diameter of the motor shaft (202) defining loose fit between the bristle assembly (102) and the motor shaft (202).

Also, the plurality of bristles (22) is structured to contact the blades (206) of the fan (200) to clean the fan (200). The bristle assembly (102) further includes a plurality of rods (30) which extends radially between the hub (10) and the bristle holder (20) to supporting the bristle holder (20) on the hub (10).

In an embodiment, a tray (not shown in figure) may be provided within the housing (204) to collect the dust, debris, and other containment components cleaned by the cleaning assembly (100).

The working of the cleaning assembly (100) is as following, firstly the bristle assembly (102) is rotatably mounted adjacent to blades (206) of the fan (200) via the hub (10). The hub (10) is defined with the provision (12) which allows to be mounted on the motor shaft (202) of the fan (200). Further, the hub (10) is mounted on the motor shaft (202) via a mounting means (14). The provision (12) provided in the hub (10) is having a diameter larger than the diameter of the motor shaft (202) to facilitate a loose fit. Secondly, the bristle assembly (102) having the plurality of bristles (22) is structed to contact the blades (206) of the fan (200) mounted on the motor shaft (202). The plurality of bristles (22) is provided along the periphery of the bristle holder (20). The bristle holder (20) extends around in a radially spaced position relative to the hub (10) such that the bristle holder (20) is connected and supported to the hub (10) via the plurality of rods (30) extending radially from the hub (10). Once the motor shaft (202) of the fan (200) is actuated by the motor (208), the blades (206) of the fan (200) rotate along the motor shaft (202). As the bristle assembly (102) is mounted with loose fit with respect to the motor shaft (202), the bristle assembly (102) rotates at a speed less than a speed of the blades (206). Thus, this forms a point contact between the plurality of bristles (22) and the blades (206) thereby, providing continuous cleaning of the fan (200). In an embodiment, the dust, debris, or other containment components cleaned may be collected in the tray for preventing harmful discharge in the environment.

In an embodiment, the cleaning assembly (100) of the present disclosure may be used for different types of fans applicable for domestic purposes such as exhaust fans, ventilations fans, radial fans etc.

It is to be understood that a person of ordinary skill in the art may develop a structure of similar configuration without deviating from the scope of the present disclosure. Such modifications and variations may be made without departing from the scope of the present invention. Therefore, it is intended that the present disclosure covers such modifications and variations provided they come within the ambit of the appended claims and their equivalents.

ADVANTAGES OF THE INVENTION

A cleaning assembly for a fan in accordance with the present disclosure that is simple and easy to operate.

A cleaning assembly in accordance with the present disclosure is configured with loose fit to the blades of the fan to eliminate additional mechanism and assembling parts, reducing overall manufacturing and maintenance cost and therefore is economical in nature.

A cleaning assembly in accordance with the present disclosure comprises a bristle holder designed for different shapes and sizes of fans.

A cleaning assembly in accordance with the present disclosure comprises of bristle holder that is easily replaceable. Further, each part of cleaning assembly is removably attached to the fan.

A cleaning assembly in accordance with the present disclosure comprises of bristle assembly structured to contact the blades of the fan to provide continuous self-cleaning.

Equivalents:

With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to inventions containing only one such

recitation, even when the same claim includes the introductory phrases “one or more” or “at least one” and indefinite articles such as “a” or “an” (e.g., “a” and/or “an” should typically be interpreted to mean “at least one” or “one or more”); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should typically be interpreted to mean at least the recited number (e.g., the bare recitation of “two recitations,” without other modifiers, typically means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to “at least one of A, B, and C, etc.” is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., “a system having at least one of A, B, and C” would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances, where a convention analogous to “at least one of A, B, or C, etc.” is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., “a system having at least one of A, B, or C” would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase “A or B” will be understood to include the possibilities of “A” or “B” or “A and B.” While various aspects and embodiments have been disclosed herein, other aspects and embodiments will be apparent to those skilled in the art. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

WE CLAIM:

1. A cleaning assembly (100) for a fan (200), the cleaning assembly (100) comprising:

   a bristle assembly (102) mounted adjacent to blades of the fan (200), the bristle assembly (102) comprising:

   a hub (10) defined with a provision (12) to receive and mount over a motor shaft (202) coupled to the blades of the fan (200);

   a bristle holder (20) extending around in a radially spaced position relative to the hub (10); and

   a plurality of bristles (22) supported and disposed about a periphery of the bristle holder (20);

   wherein the bristle assembly (102) is configured to rotate at a speed less than a speed of the blades, and wherein the plurality of bristles (22) is structured to contact the blades of the fan (200) to clean the fan (200).

2. The cleaning assembly (100) as claimed in claim 1, wherein the bristle assembly (102) comprises a plurality of rods (30) extending radially between the hub (10) and the bristle holder (20), supporting the bristle holder (20) on the hub (10).

3. The cleaning assembly (100) as claimed in claim 1, wherein diameter of the provision (12) defined in the hub (10) is larger than a diameter of the motor shaft (202) defining a loose fit between the bristle assembly (102) and the motor shaft (202).

4. The cleaning assembly (100) as claimed in the claim 1, wherein the bristle holder (20) is made of a flexible material.

5. The cleaning assembly (100) as claimed in claim 2, wherein the plurality of rods (30) is made of a flexible material.

6. The cleaning assembly (100) as claimed in claim 1, wherein the plurality of bristles (22) is structured make a point contact with blades to clean the fan (200).

7. A fan (200) comprising;

   a housing (204) defining a space;

   a motor (208) enclosed within the housing (204);

   a motor shaft (202) extending from the motor (208);

a blade (206) rotatably coupled on the motor shaft (202); and

a cleaning assembly (100), comprising:

a bristle assembly (102) rotatably mounted on the motor shaft (202) defining a loose fit and disposed at least at one of distal end and proximal end of the blade (206), wherein the bristle assembly (102) comprising:

a hub (10) defined with a provision (12) to receive and mount over the motor shaft (202);

a bristle holder (20) extending around in a radially spaced position relative to the hub (10); and

a plurality of bristles (22) supported and disposed about a periphery of the bristle holder (20);

wherein the bristle assembly (102) is configured to rotate at a speed less than a speed of the blades (206), and wherein the plurality of bristles (22) is structured to contact the blades (206) to clean the fan (200).

8. The fan (200) as claimed in claim 7, wherein the bristle assembly (102) comprises a plurality of rods (30) extending radially between the hub (10) and the bristle holder (20), supporting the bristle holder (20) on the hub (10).

9. The fan (200) as claimed in claim 7, wherein diameter of the provision (12) defined in the hub (10) is larger than a diameter of the motor shaft (202) defining a loose fit between the bristle assembly (102) and the motor shaft (202).

10. The fan (200) as claimed in claim 7, wherein the bristle assembly (102) is rotatably mounted at both the distal end and proximal end of the blade (206).

Dated this 22nd day of August 2022

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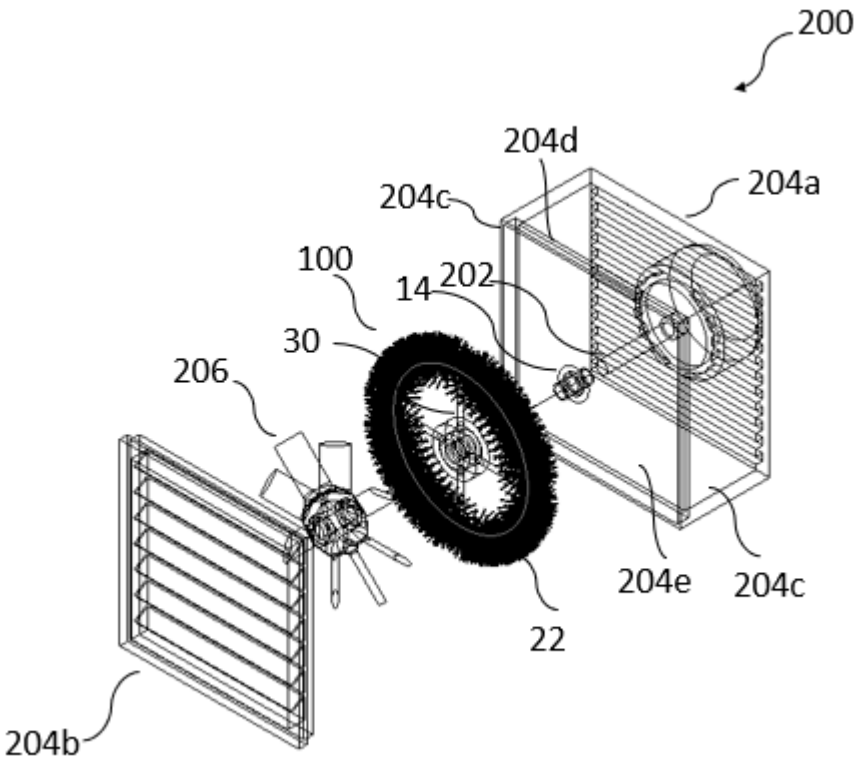
ABSTRACT

A CLEANING ASSEMBLY FOR A FAN

The present disclosure relates to a cleaning assembly (100) for a fan (200) to facilitate self-cleaning. The cleaning assembly (100) comprises a bristle assembly (102) mounted adjacent to blades of the fan. The bristle assembly includes a hub (10), a bristle holder (20) and a plurality of bristles (22). The hub has a provision (12) to receive and mount over a motor shaft (202) coupled to the blades (206). The bristle holder (20) extends around in a radially spaced position relative to the hub and the plurality of bristles is supported and disposed about a periphery of the bristle holder. The bristle assembly is configured to rotate at a speed less than a speed of the blades. The plurality of bristles is structured to contact the blades to clean the fan (200).



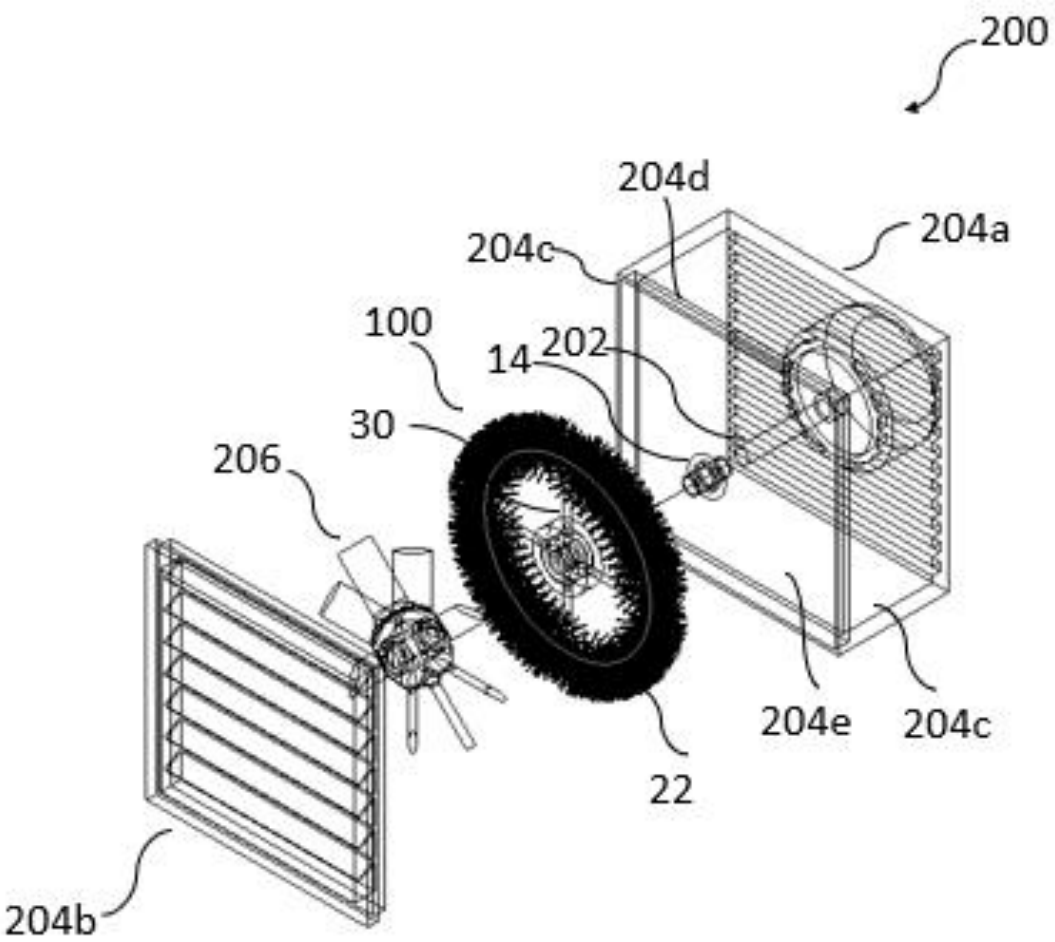


Fig. 1

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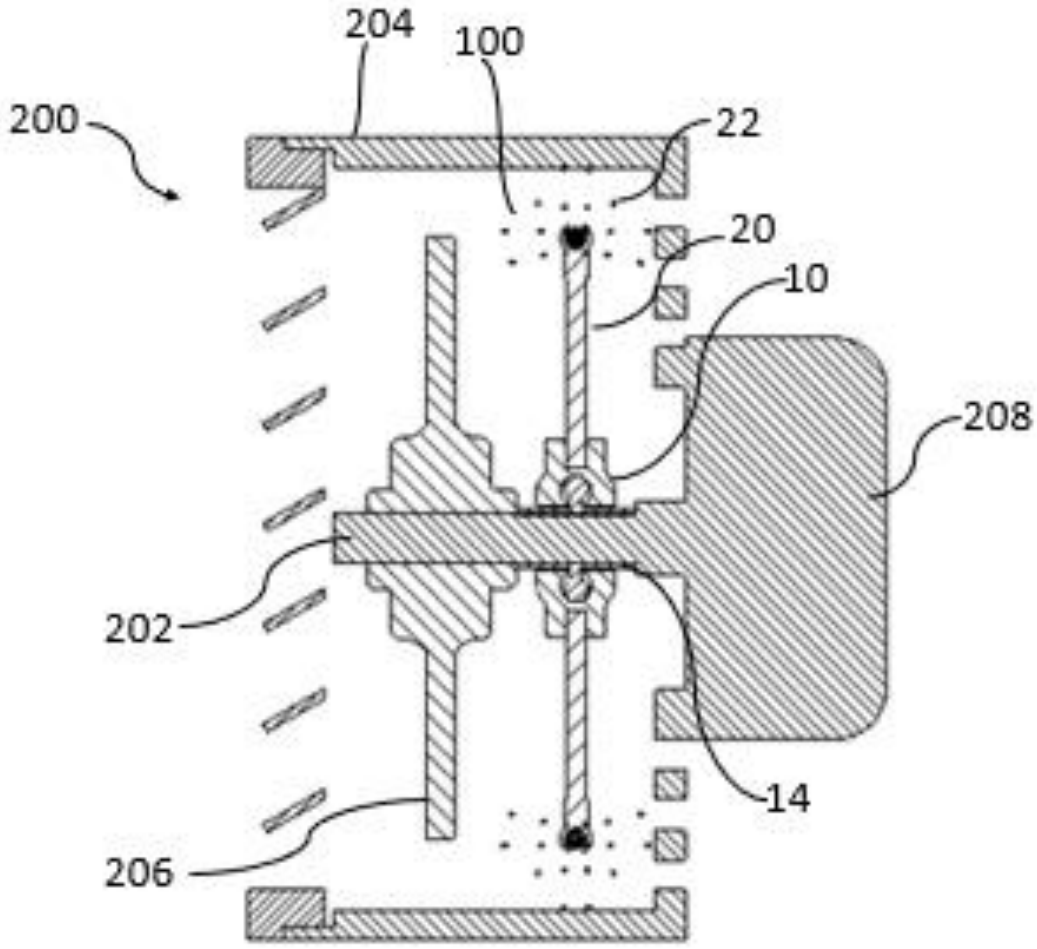

Fig.2

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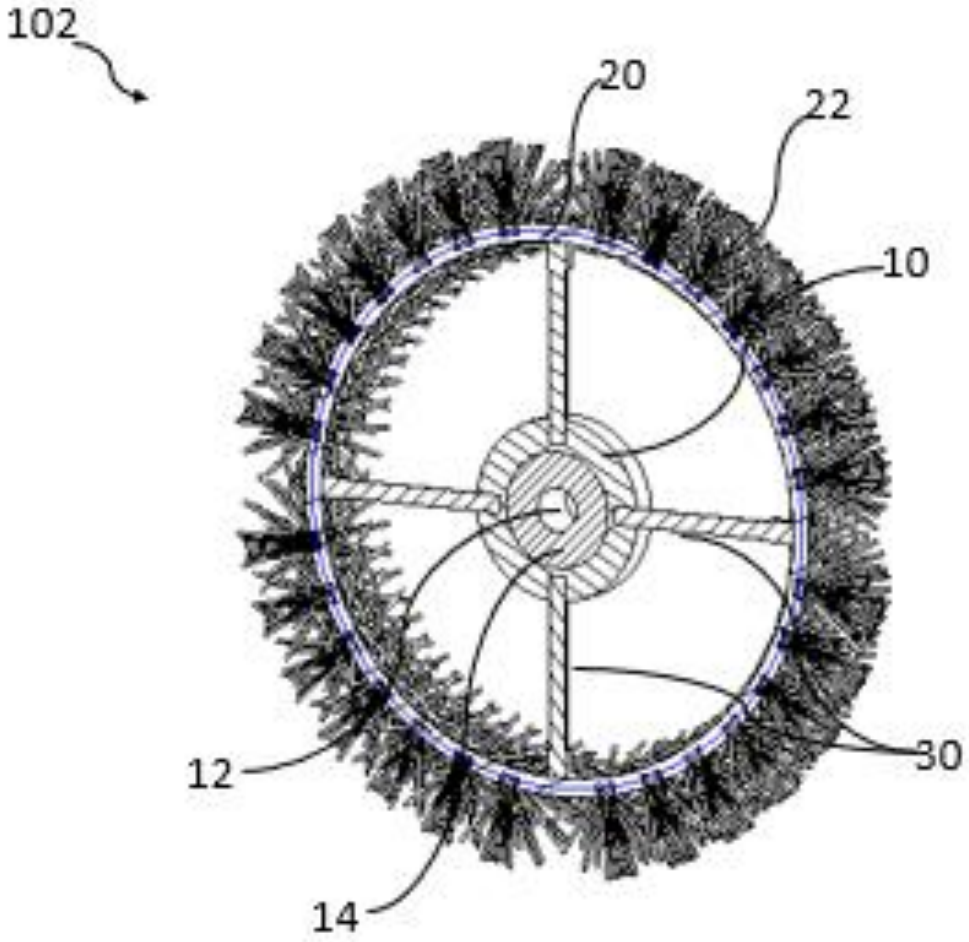

Fig. 3

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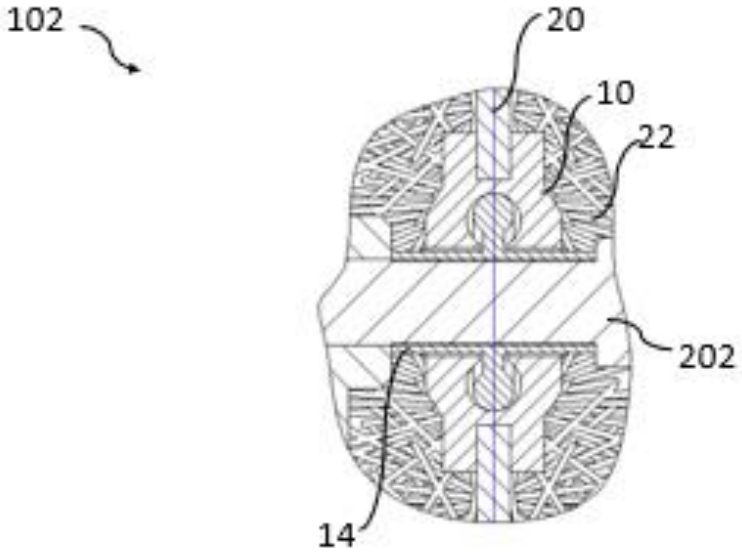

Fig.4a

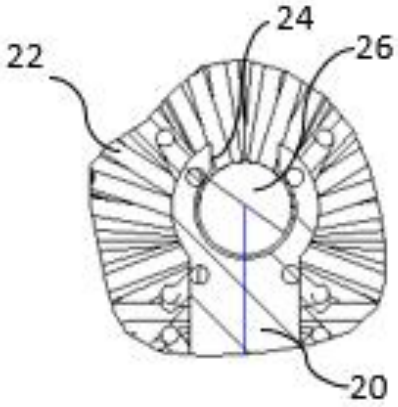

Fig.4b

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DLF 3rd Block, 2nd Floor,
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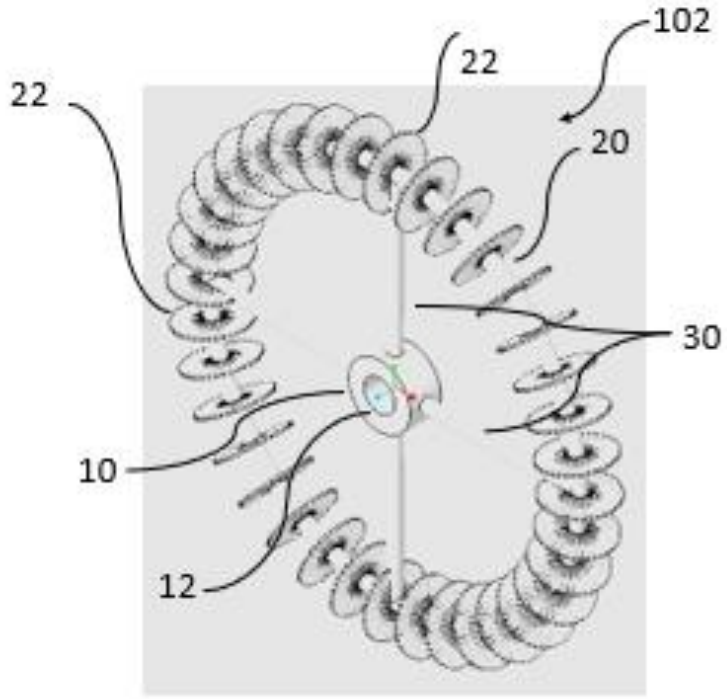

Fig. 5

-- Digitally Signed--
Bhanu Prasad (INPA No: 3253)
Manager, IPR Dept.,
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