

[DESCRIPTION]

[Title of Invention]

ROTARY BODY MOUNTING DEVICE, OIL COLLECTION DEVICE, AND RANGE HOOD

[Technical Field]

[0001]

The present invention relates to a rotary body mounting device in a range hood or the like.

[Background Art]

[0002]

A range hood includes a rotary body for performing exhaust such as a propeller fan, a sirocco fan, or a turbo fan, and a rotary body for collecting oil and dust such as a grease filter. Collection of exhaust and oil contained in the exhaust is performed by rotating these rotary bodies with a motor.

Oil or the like deriving from greasy fumes generated by cooking easily adheres to the rotary body such as the fan or the grease filter, and hence periodic cleaning is necessary. Accordingly, in order to clean the soiled rotary body, it is necessary to detach the rotary body from a drive shaft periodically.

For example, in the invention disclosed in PTL 1, a boss tube and a main body of an impeller can be separated from each other by detaching an attaching knob having a screw called a spinner. However, in particular, in the case where the impeller is attached downward, when the spinner is detached, three members which are the boss tube, the main body of the impeller, and the spinner are detached separately, and the members may fall. In order to prevent the falling, it is necessary to detach, while supporting the main body of the impeller with one hand, the spinner with the other hand, and a worker is forced to take such a posture in space having low working efficiency.

Further, at the time of mounting, it is necessary to turn the spinner while supporting the main body of the impeller similarly, and working efficiency is low.

[Citation List]

[Patent Literature]

[0003]

[PTL 1] Japanese Utility Model Application Laid-open No. S60-36599

[Summary of Invention]

[Technical Problem]

[0004]

An object of the present invention is to provide a rotary body mounting device in which working efficiency in attachment to and detachment from a power shaft is improved.

[Solution to Problem]

[0005]

A first aspect of the present invention is a rotary body mounting device 30 which is inserted into a power shaft 20, the rotary body mounting device 30 including: a rotary body; and an attaching device 302, wherein the attaching device 302 has: an insertion hole into which the power shaft 20 is inserted; a drive connecting part which is connected to the power shaft 20; a power shaft attaching/detaching mechanism operation part which attaches and detaches the rotary body mounting device to and from the power shaft 20 on a side on which the power shaft 20 is not inserted into the attaching device 302 with the rotary body used as a reference; and a rotary body attaching/detaching mechanism operation part which attaches and detaches the rotary body to and from the rotary body mounting device 30 on a side on which the power shaft 20 is inserted into the attaching device 302 with the rotary body used as the reference, whereby the problem is solved.

[0006]

With this, it becomes possible to easily and integrally detach the rotary body mounting device 30 including the rotary body and the attaching device 302 from the power shaft 20.

In addition, by providing the rotary body attaching/detaching mechanism operation part of the attaching device on the side on which the power shaft 20 is inserted into the attaching device 302 with the rotary body used as the reference, in a state in which the rotary body mounting device 30 is mounted to the power shaft 20, the rotary body attaching/detaching mechanism operation part of the attaching device is positioned at the back of the rotary body, and cannot be reached. As a result, it is not possible to operate the rotary body attaching/detaching mechanism operation part of the attaching device before the rotary body mounting device 30 is detached, as described above. With this, it becomes possible to prevent the rotary body attaching/detaching mechanism operation part of the attaching device from being operated by mistake in the state in which the rotary body mounting device 30 is mounted to the power shaft 20.

[0007]

As in a second aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to the first aspect in which the attaching device 302 is comprised of an attaching/detaching device 40 which has the

power shaft attaching/detaching mechanism operation part and a rotary body hold device 50 which has the rotary body attaching/detaching mechanism operation part 5011.

The attaching device 302 is separated into the attaching/detaching device 40 and the rotary body hold device 50, whereby it is possible to facilitate attachment and detachment of the rotary body.

[0008]

As in a third aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to the second aspect in which the attaching/detaching device 40 includes a boss tube 431 which is inserted into the rotary body, and the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device 50 is provided so as to retain and release the boss tube 431.

With this, by operating the rotary body attaching/detaching mechanism operation part 5011 only once, it becomes possible to disassemble the rotary body mounting device 30 into three members which are the attaching/detaching device 40, the rotary body, and the rotary body hold device 50. In addition, in the state in which the rotary body mounting device 30 is mounted to the power shaft 20, it is possible to prevent the attaching/detaching device 40 and the rotary body hold device 50 from being separated by mistake.

[0009]

As in a fourth aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to the second or third aspect in which the attaching/detaching device 40 and/or the rotary body hold device 50 has an urging part which presses the rotary body.

With this, backlash between the rotary body and the rotary body hold device 50 and/or backlash between the rotary body and the attaching/detaching device 40 is eliminated, and noises or the like are not made.

[0010]

As in a fifth aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to the fourth aspect in which a tapered face 4312 which contracts toward a side of the rotary body is provided in the attaching/detaching device 40, and the urging part of the rotary body hold device 50 is configured by an urging member which pinches the tapered face 4312 and is configured to function also as a rotary body attaching/detaching mechanism 501 by providing an operation part 5011 which opens the urging member.

With this, the urging part of the rotary body hold device 50 can have two

functions including a function of retaining and releasing the boss tube 431 and a function of pressing the rotary body.

[0011]

As in a sixth aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to any one of the second to fifth aspects in which the rotary body has a recess and/or a projection on a mounting face to which the attaching/detaching device and/or the rotary body hold device is mounted, and a projection and/or a recess is provided in the attaching/detaching device 40 and/or the rotary body hold device 50 so as to fit into the recess and/or the projection.

[0012]

For example, in the case where the rotary body is a grease filter (rotary body) 301, the grease filter (rotary body) 301 has a front face and a back face and, in the case where the rotary body is a sirocco fan, the sirocco fan has an upper face and a lower face. When the rotary body is not mounted to each of the attaching/detaching device 40 and the rotary body hold device 50 with a proper face, there are cases where the rotary body does not function properly.

In such cases, the rotary body has the recess or the projection on the side of the attaching/detaching device which fits into the projection or the recess on the side of the rotary body which is provided in the attaching/detaching device 40, whereby it is possible to prevent the rotary body from being attached reversely or upside down by mistake.

[0013]

In addition, as another aspect, in the rotary body hold device, the projection or the recess on the side of the rotary body which fits into the recess or the projection on the side of the rotary body hold device which is provided in the rotary body may be provided.

The recess and/or the projection of the rotary body may be, e.g., a curve obtained by curving the mounting face which is a projection projecting to the side of the attaching/detaching device 40 (a curve which is a recess when viewed from the side of the rotary body hold device 50), and the recess and the projection may be provided only on the side of the attaching/detaching device 40 of the mounting face or only on the side of the rotary body hold device 50 of the mounting face. It will be easily understood that the recess and the projection may be provided on each of the side of the attaching/detaching device 40 and the side of the rotary body hold device 50. In any case, it is only necessary to provide the recess/or the projection in the attaching/detaching device 40 and/or the rotary body hold device 50 such that the recess

and/or the projection fit into the recess and/or the projection provided on the mounting face of the rotary body. In addition, the recess and the projection can have various shapes.

[0014]

As in a seventh aspect of the present invention, the rotary body mounting device may be the rotary body mounting device 30 according to any one of the claims 2 to 6 in which the rotary body has at least one engaging mechanism (3016, 3018), and the attaching/detaching device 40 or the rotary body hold device 50 has an engaged mechanism (434, 435) which engages with the engaging mechanism (3016, 3018).

With this, it becomes possible to reliably prevent the rotary body from rotating.

[0015]

As in an eighth aspect of the present invention, an oil collection device may be an oil collection device including: the rotary body mounting device 30 according to the above aspect; a power device 4 which rotates the rotary body mounting device 30; and an oil collection member 5 which collects oil.

With this, by additionally providing the oil collection member 5, even in an environment in which oil easily adheres, use of the rotary body mounting device 30 is facilitated.

[0016]

As in a ninth aspect of the present invention, a range hood may be a range hood 1 including the rotary body mounting device 30 according to the above aspect or the oil collection device according to the above aspect.

The rotary body mounting device and the oil collection device encompassed in the present invention can be used in various rotary bodies and, among them, the rotary body used in the range hood 1 includes a grease filter and a fan, and it is proved that the rotary body mounting device and the oil collection device can be utilized for the grease filter and the fan.

[Advantageous Effects of Invention]

[0017]

According to the present invention, it is possible to integrally attach and detach the rotary body mounting device comprised of the rotary body and the attaching device to and from the power shaft, and hence working efficiency is improved.

[Brief Description of Drawings]

[0018]

[Fig. 1]

Fig. 1 is a perspective view from a bottom face side of a range hood from which a

straightening plate is detached.

[Fig. 2]

Fig. 2 is a perspective view from an upper side of the range hood from which part of a blower box is removed for the sake of convenience of explanation.

[Fig. 3]

Fig. 3 at (A) is a perspective view of a grease filter drive motor (power device) according to Embodiment 1,

Fig. 3 at (B) is a perspective view when a grease filter (rotary body) and an attaching device are viewed from the side of the grease filter drive motor (power device), and

Fig. 3 at (C) is a perspective view in which an area in a one-dot chain line circle in Fig. 3 at (B) is enlarged.

[Fig. 4]

Fig. 4 at (A) is a front view of a rotary body mounting device according to Embodiment 1,

Fig. 4 at (B) is a cross-sectional view thereof, and

Fig. 4 at (C) shows a cross-sectional view indicative of positions of rotary body pressing stoppers when the rotary body is detached and a conceptual diagram showing a positional relationship between the rotary body pressing stoppers and an attaching device insertion hole of the grease filter.

[Fig. 5]

Fig. 5 at (A) is a front view of the grease filter drive motor according to Embodiment 2,

Fig. 5 at (B) is a front view of the rotary body mounting device,

Fig. 5 at (C) is an exploded front view in which a rotary body hold device of the rotary body mounting device is detached, and

Fig. 5 at (D) is an exploded front view in which the rotary body hold device of the rotary body mounting device and the grease filter (rotary body) are detached.

[Fig. 6]

Fig. 6 at (A) is an exploded view of an attaching/detaching device according to Embodiment 2, and

Fig. 6 at (B) is a front view of a boss member.

[Fig. 7]

Fig. 7 is a perspective view of a boss member lower face showing an abutting relationship between a power shaft and a first power shaft retaining lever according to Embodiment 2.

[Fig. 8]

Fig. 8 is a perspective view of the attaching/detaching device of the rotary body mounting device and the grease filter (rotary body) according to Embodiment 2.

[Fig. 9]

Fig. 9 is an exploded view of the rotary body hold device according to Embodiment 2.

[Fig. 10]

Fig. 10 at (A) is an enlarged view of a boss tube according to Embodiment 2, and

Fig. 10 at (B) is a perspective view showing a retaining relationship between the boss tube and a rotary body attaching/detaching mechanism.

[Fig. 11]

Fig. 11 is a conceptual diagram showing a relationship between a boss tube retaining member (rod spring having clamp action) and a boss tube tip part according to Embodiment 2.

[Fig. 12]

Fig. 12 is a conceptual diagram showing implementations of an urging part according to Embodiment 2.

[Fig. 13]

Fig. 13 is an exploded view showing a mounting relationship among the attaching/detaching device, the grease filter (rotary body), and the rotary body hold device according to Embodiment 2.

[Fig. 14]

Fig. 14 at (A) is a perspective view of the rotary body hold device according to Embodiment 3, and

Fig. 14 at (B) is a perspective view in which an upper cover is removed.

[Fig. 15]

Fig. 15 at (A) is a perspective view of the rotary body hold device according to Embodiment 4, and

Fig. 15 at (B) is a plan view in which the upper cover is removed.

[Fig. 16]

Fig. 16 at (A) is a perspective view of the rotary body mounting device according to Embodiment 5,

Fig. 16 at (B) is a perspective view in which the rotary body hold device is detached,

Fig. 16 at (C) is a perspective view of the attaching/detaching device,

Fig. 16 at (D) is a perspective view when the rotary body hold device is viewed from the side of the grease filter, and

Fig. 16 at (E) is an enlarged perspective view of the grease filter (rotary body).

[Fig. 17]

Fig. 17 is a perspective view of the rotary body attaching/detaching mechanism of the rotary body hold device according to Embodiment 5.

[Fig. 18]

Fig. 18 is a perspective view of a state in which members which are not necessary for explanation of the rotary body hold device according to Embodiment 5 are detached.

[Description of Embodiments]

[0019]

<Embodiment 1>

Embodiment 1 is an embodiment in which the present invention is applied to a grease filter (rotary body) 301 of a range hood 1. Fig. 1 is a perspective view from a bottom face side of the range hood 1 from which a straightening plate is detached, and shows a state in which the straightening plate which covers the lower face of the range hood 1 is detached. The grease filter (rotary body) 301 corresponding to a rotary body is mounted by an attaching device 302.

To a surrounding area of the grease filter (rotary body) 301, a bell mouth (oil collection member) 5 which functions also as an oil collection member is mounted.

[0020]

A rotary body mounting device 30 is configured by at least two members which are the grease filter (rotary body) 301 and the attaching device 302. The attaching device 302 is a member which is positioned on both sides of the grease filter (rotary body) 301 and, in Fig. 1 which is a perspective view from the bottom face side, the lower side of the attaching device 302 is visible. A power shaft attaching/detaching mechanism operation part 303 of the attaching device protrudes from both sides of the attaching device 302.

[0021]

When the power shaft attaching/detaching mechanism operation part 303 of the attaching device is pressed, the rotary body mounting device 30 is detached from a power shaft (not shown) inserted into the rotary body mounting device 30. A specific structure is the same as that of “1. Attaching/detaching device, A. Power shaft attaching/detaching mechanism” of Embodiment 2 described later.

The rotary body mounting device 30 configured by the grease filter (rotary body) 301 and the attaching device 302 can be detached integrally from a power shaft 20, and hence, as long as the attaching device 302 is retained by a worker, even when the grease filter (rotary body) 301 is not particularly supported, the grease filter (rotary body) 301 is prevented from being detached and falling.

[0022]

Fig. 2 is a perspective view from an upper side of the range hood 1 from which part of a blower box is removed for the sake of convenience of explanation. A fan casing 6 is provided in the blower box, and a fan and a motor for driving the fan are housed inside the fan casing 6. A grease filter drive motor (power device) 4 for driving the grease filter (rotary body) 301 is fixed onto a grease filter drive motor crosspiece 7.

[0023]

Fig. 3 at (A) is a perspective view of the grease filter drive motor (power device) 4 according to Embodiment 1, Fig. 3 at (B) is a perspective view when the grease filter (rotary body) 301 and the attaching device 302 are viewed from the side of the grease filter drive motor (power device) 4, and Fig. 3 at (C) is a perspective view in which an area in a one-dot chain line circle in Fig. 3 at (B) is enlarged.

[0024]

The power shaft 20 of the grease filter drive motor (power device) 4 described in Fig. 3 at (A) is inserted into a power shaft insertion hole 305 depicted in each of Fig. 3 at (B) and Fig. 3 at (C). In addition, a pair of drive pins 201 provided in the power shaft 20 are fitted in a drive pin receiving groove 306 provided near an entrance of the power shaft insertion hole 305. A plurality of pairs of the drive pin receiving grooves 306 are provided and configured such that, no matter in which circumferential direction the power shaft 20 is inserted into the power shaft insertion hole 305, the power shaft 20 can be fitted.

[0025]

As shown in Fig. 3 at (B), a pair of rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are provided in the attaching device 302, and a pair of rotary body pressing stoppers 3072 project from the upper face of the grease filter (rotary body) 301. In addition, the bell mouth (oil collection member) 5 is placed around the grease filter (rotary body) 301, and functions as the oil collection member, as will be described later.

[0026]

Fig. 4 at (A) shows a front view of the rotary body mounting device 30 according to Embodiment 1, Fig. 4 at (B) shows a cross-sectional view thereof, and Fig. 4 at (C) shows a cross-sectional view indicative of the positions of the rotary body pressing stoppers 3072 when the rotary body is detached, and a conceptual diagram showing a positional relationship between the rotary body pressing stoppers 3072 and an attaching device insertion hole 3011 of the grease filter (rotary body) 301.

As shown in Figs. 4 at (A) to 4(C), the rotary body mounting device 30 is an assembly of two configuring members which are the grease filter (rotary body) 301 and

the attaching device 302.

A rotary body attaching/detaching mechanism 307 is configured by the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device and the rotary body pressing stoppers 3072, and the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are pressed when the grease filter (rotary body) 301 serving as the configuring member of the rotary body mounting device 30 is detached from the attaching device 302 for cleaning or the like.

[0027]

In a state of Fig. 4 at (B) showing a state before the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are pressed, when the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are pressed, as shown in Fig. 4 at (C), the rotary body pressing stoppers 3072 are configured to move into the attaching device 302, and be completely housed in the attaching device 302. Although the movement mechanism of the rotary body pressing stoppers 3072 is not shown in the drawing, the type of the movement mechanism is not limited, and examples of the movement mechanism include a movement mechanism in which the rotary body attaching/detaching mechanism operation part 3071 of the attaching device and the rotary body pressing stopper 3072 are linked by a link mechanism, and a movement mechanism in which an electromagnetic relay which operates based on the operation of the rotary body attaching/detaching mechanism operation part 3071 of the attaching device is provided and the rotary body pressing stopper 3072 is thereby moved.

[0028]

When the rotary body pressing stoppers 3072 are completely housed in the attaching device 302 by operating the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device, as shown in Fig. 4 at (C), it becomes possible to pull out the attaching device 302 from the attaching device insertion hole 3011 provided at the center of the grease filter (rotary body) 301.

Attachment of the grease filter (rotary body) 301 to the attaching device 302 may be performed by performing the above procedure reversely.

[0029]

It can be seen that, in the attaching device 302, the power shaft 20 is inserted from the side of the power shaft insertion hole 305 in Fig. 4 at (A), and, in the attaching device 302, the power shaft attaching/detaching mechanism operation part 303 of the attaching device which attaches and detaches the attaching device 302 to and from the power shaft 20 is provided on a side on which the power shaft 20 is not inserted into the

attaching device 302 with the grease filter (rotary body) 301 used as a reference.

When the power shaft attaching/detaching mechanism operation part 303 of the attaching device is placed at such a position, as shown in Fig. 1, it becomes possible to easily reach the power shaft attaching/detaching mechanism operation part 303 from the lower side of the range hood 1.

Even in the case of the range hood 1 in which the power shaft 20 is horizontally provided, the power shaft attaching/detaching mechanism operation part 303 of the attaching device is easily reached.

[0030]

In addition, the attaching device 302 has the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device on a side on which the power shaft 20 is inserted into the attaching device 302 with the grease filter (rotary body) 301 used as the reference.

When the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are placed at such positions, it is not possible to detach the grease filter (rotary body) 301 from the attaching device 302 before the rotary body mounting device 30 is detached from the power shaft 20. As can be seen from Fig. 1, the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device are not visible from below the range hood 1 and are placed at positions which cannot be reached, and a worker cannot operate the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device by mistake.

The grease filter (rotary body) 301 is made detachable from the attaching device 302 in order to facilitate cleaning of the grease filter (rotary body) 301 by detaching the grease filter (rotary body) 301. In addition, when the grease filter (rotary body) 301 which can be disposed when the grease filter (rotary body) 301 is soiled is used, it is easy to replace the grease filter (rotary body) 301 because of the rotary body attaching/detaching mechanism operation parts 3071 of the attaching device.

[0031]

In Embodiment 1, the description has been made by using the rotary body as the grease filter (rotary body) 301, but the rotary body may also be used as a fan used in the range hood 1. In addition, the present invention is a general-purpose technique which can be used in the rotary body other than that in the range hood. The same applies to the following embodiments.

[0032]

(Oil collection device)

The bell mouth (oil collection member) 5 shown in each of Figs. 1 and 3 at (B) has an annular groove part so as to be able to collect oil which flies from the grease filter (rotary body) 301 by centrifugal force, and functions also as the oil collection member. The accumulated oil can be easily abandoned only by detaching the bell mouth (oil collection member) 5.

In the case where the rotary body is a fan as well, the oil collection member for collecting oil which flies from the fan by centrifugal force may be provided. In addition, the oil collection member for collecting oil which drips from the casing of the fan or the like may be provided.

The shape and the installation position of the oil collection member can be appropriately changed according to which member oil drips from or a position onto which oil drips.

The oil collection member is not limited to the bell mouth (oil collection member) 5, and the present invention encompasses various oil collection members. In addition, an exhaust pipe for exhausting oil may also be provided in the oil collection member.

In any case, in an environment in which oil adheres to the rotary body, it is possible to easily dispose of oil by providing the oil collection member.

[0033]

#### <Embodiment 2>

Embodiment 2 is an embodiment in which the grease filter (rotary body) 301 used in the range hood 1 is used as the rotary body. Embodiment 2 is different from Embodiment 1 in that the attaching device 302 can be further separated into an attaching/detaching device 40 and a rotary body hold device 50.

Fig. 5 at (A) shows a front view of the grease filter drive motor (power device) 4 according to Embodiment 2, Fig. 5 at (B) shows a front view of the rotary body mounting device 30, Fig. 5 at (C) shows an exploded front view in which the rotary body hold device 50 of the rotary body mounting device 30 is detached, and Fig. 5 at (D) shows an exploded front view in which the rotary body hold device 50 of the rotary body mounting device 30 and the grease filter (rotary body) 301 are detached.

[0034]

As will be described in “1. Attaching/detaching device, A. Power shaft attaching/detaching mechanism” described later, Fig. 5 at (A) shows a contracting part 202 of the power shaft 20 retained by first and second power shaft retaining levers (403, 404) which are configuring members of the power shaft attaching/detaching mechanism.

The power shaft 20 is inserted from a boss tube power shaft insertion hole 433 in Fig. 5(B), and the rotary body mounting device 30 is mounted to the power shaft 20. [0035]

Although the power shaft 20 is not shown in Fig. 5 at (B), by operating a power shaft attaching/detaching mechanism operation part 401 of the attaching/detaching device in Fig. 5 at (B), the rotary body mounting device 30 (configured by three members which are the rotary body hold device 50, the grease filter (rotary body) 301, and the attaching/detaching device 40) can be integrally detached from the power shaft 20. [0036]

As shown in Fig. 5 at (C), after the rotary body mounting device 30 is detached from the power shaft 20, by operating a rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device, the rotary body hold device 50 having held the grease filter (rotary body) 301 is detached, and it becomes possible to detach the grease filter (rotary body) 301. [0037]

As shown in Fig. 5 at (D), when the grease filter (rotary body) 301 is detached from the attaching/detaching device 40 lastly, all three members configuring the rotary body mounting device 30 are separated from each other. [0038]

As can be seen from Fig. 5 at (B), the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device is provided on the side on which the power shaft 20 is inserted into the rotary body mounting device 30 with the grease filter (rotary body) 301 used as the reference, and it is possible to attach and detach the grease filter (rotary body) 301 to and from the rotary body mounting device 30 by operating the rotary body attaching/detaching mechanism operation part 5011.

In the range hood 1, similarly to Embodiment 1, in a state in which the rotary body mounting device 30 is attached, the grease filter (rotary body) 301 becomes a hindrance and it is not possible to operate the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device.

The power shaft attaching/detaching mechanism operation part 401 of the attaching/detaching device is provided in the attaching/detaching device 40 and, when the power shaft attaching/detaching mechanism operation part 401 is operated, the entire rotary body mounting device 30 is separated from the power shaft 20, and it is possible to integrally detach three members which are the grease filter (rotary body) 301, the attaching/detaching device 40, and the rotary body hold device 50.

The rotary body mounting device 30 in Fig. 5 at (B) is placed such that the

power shaft attaching/detaching mechanism operation part 401 of the attaching/detaching device is placed at a position which can be seen by a worker only by detaching the straightening plate from the range hood 1, and the rotary body mounting device 30 is configured so as to be able to be easily operated.

[0039]

Next, the structure and function of the rotary body mounting device 30 will be described.

#### 1. Attaching/detaching device

##### A. Power shaft attaching/detaching mechanism

Fig. 6 at (A) is an exploded view of the attaching/detaching device 40 according to Embodiment 2, and Fig. 6 at (B) is a front view of a boss member 43. In the attaching/detaching device 40, the power shaft attaching/detaching mechanism configured by the first power shaft retaining lever 403, the second power shaft retaining lever 404, and power shaft retaining lever urging members 402 is housed. Each of the first power shaft retaining lever 403 and the second power shaft retaining lever 404 includes the power shaft attaching/detaching mechanism operation part 401 of the attaching/detaching device, a retaining lever power shaft insertion hole 405, and a power shaft abutting retaining part 407.

Please refer to Fig. 6 at (A). A support cover 42 is housed in an attaching/detaching device under cover 41. The first power shaft retaining lever 403 and the second power shaft retaining lever 404 are slidably provided on the support cover 42.

[0040]

An urging member abutting part 406 is provided in each of the first power shaft retaining lever 403 and the second power shaft retaining lever 404, and one end of the power shaft retaining lever urging member 402 abuts on the urging member abutting part 406. The other end of the power shaft retaining lever urging member 402 abuts on the boss member 43 (see Fig. 7).

[0041]

The power shaft retaining lever urging members 402 urge the first and second power shaft retaining levers (403, 404) in directions of arrows in Fig. 6, and the power shaft attaching/detaching mechanism operation parts 401 of the attaching/detaching device are urged so as to protrude to the outside of the boss member 43.

Fig. 7 is a perspective view of a boss member lower face showing an abutting relationship between the power shaft 20 and the first power shaft retaining lever 403 according to Embodiment 2, and shows a state in which the first power shaft retaining

lever 403 retains the contracting part 202 of the power shaft 20. For the sake of convenience of explanation, the second power shaft retaining lever 404 is not shown. The first and second power shaft retaining levers (403, 404) retain the contracting part 202 of the power shaft 20 with the power shaft retaining lever urging members 402. With regard to the shape of the contracting part 202 of the power shaft 20, please refer to Fig. 5 at (A).

[0042]

It can be seen that, as described above, the first power shaft retaining lever 403 is urged by the power shaft retaining lever urging member 402 (is positioned behind the back face of the first power shaft retaining lever 403 and is not shown) in the direction of the arrow shown in the drawing, and the power shaft abutting retaining part 407 abuts on and retains the contracting part 202 of the power shaft 20. The same applies to the second power shaft retaining lever 404.

When the rotary body mounting device 30 is attached to the power shaft 20, the contracting part 202 of the power shaft 20 is retained from both sides by the first and second power shaft retaining levers (403, 404).

An example of the power shaft retaining lever urging member 402 includes a coil spring, but the power shaft retaining lever urging member 402 may be any elastic body such as a flat spring or rubber as long as the elastic body has the same function.

[0043]

Returning to Fig. 6 again, the power shaft 20 is inserted into the boss tube power shaft insertion hole 433 of the boss member 43, then passes through the retaining lever power shaft insertion holes 405 of the first and second power shaft retaining levers (403, 404) and a support cover power shaft insertion hole 421, and is inserted up to a power shaft tip abutting part 411 provided at a central part of the attaching/detaching device under cover 41. At this point, the contracting part 202 of the power shaft 20 is designed so as to be positioned at positions of the first and second power shaft retaining levers (403, 404).

[0044]

In the case where the rotary body mounting device 30 is detached from the power shaft 20, the power shaft attaching/detaching mechanism operation parts 401 of the attaching/detaching device of the first and second power shaft retaining levers (403, 404) are pushed in against the urging force of the power shaft retaining lever urging members 402. As a result, the power shaft abutting retaining parts 407 of the first and second power shaft retaining levers (403, 404) are moved away from the contracting part 202 of the power shaft 20, and it is possible to pull out the rotary body mounting

device 30 from the power shaft 20.

[0045]

B. Engaging mechanism between rotary body and attaching/detaching device (boss member)

Fig. 8 is a perspective view of the attaching/detaching device 40 of the rotary body mounting device 30 and the grease filter (rotary body) 301 according to Embodiment 2. A protrusion (engaged mechanism) 434 is shown on the side of the boss member 43 which faces the grease filter (rotary body) 301.

[0046]

A protrusion insertion hole (engaging mechanism) 3016 is provided in the grease filter (rotary body) 301, and the protrusion (engaged mechanism) 434 positioned on the upper face of the boss member 43 is configured to be inserted into the protrusion insertion hole 3016. With this, the grease filter (rotary body) 301 and the boss member 43 are prevented from rotating relative to each other firmly.

[0047]

The engaging mechanism of the rotary body and the engaged mechanism of the attaching/detaching device only need to function as detents, and the protrusion (engaged mechanism) 434 and the protrusion insertion hole (engaging mechanism) 3016 may have various shapes. In addition, in Embodiment 2, when the protrusion (engaged mechanism) 434 shown in Fig. 5 at (D) is combined with the grease filter (rotary body) 301, as shown in Fig. 5 at (C), the protrusion (engaged mechanism) 434 is configured to project from the opposite face of the grease filter (rotary body) 301. However, the protrusion (engaged mechanism) 434 may be hooked on the grease filter (rotary body) 301 simply. In addition, instead of the protrusion insertion hole (engaging mechanism) 3016, a cap (engaging mechanism) in which the protrusion (engaged mechanism) 434 just fits at the time of mounting may be provided on the upper face of the grease filter (rotary body) 301. Even with this arrangement, the grease filter (rotary body) 301 and the boss member 43 are prevented from rotating relative to each other firmly.

[0048]

In Embodiment 2, the protrusion (engaged mechanism) 434 is provided on the side of the attaching/detaching device 40, but the protrusion (engaged mechanism) 434 may be provided on the side of the rotary body hold device 50 described later, and the protrusion (engaged mechanism) may be provided in each of the attaching/detaching device 40 and the rotary body hold device 50.

In addition, the protrusion (engaged mechanism) 434 may be provided in the

grease filter (rotary body) 301, and an accommodation part (engaging mechanism) for housing the protrusion (engaged mechanism) 434 provided in the grease filter (rotary body) 301 may be provided on the side of the attaching/detaching device 40 and/or the rotary body hold device 50.

[0049]

#### C. Rotary body reverse attachment prevention mechanism

Fig. 8 shows a grease filter attaching projection 44 on the upper face of the attaching/detaching device. In the grease filter (rotary body) 301, an attaching/detaching device receiving recess 3017 which is a recess when viewed from the side of the attaching/detaching device 40 is provided on an mounting face to which the attaching/detaching device 40 is mounted.

As shown in Fig. 8, a diameter A' of the grease filter attaching projection 44 is smaller than a diameter A of the attaching/detaching device receiving recess 3017, the diameter A thereof and the diameter A' thereof are preferably substantially equal to each other, and the grease filter attaching projection 44 and the attaching/detaching device receiving recess 3017 fit into each other.

With the presence of the grease filter attaching projection 44 and the attaching/detaching device receiving recess 3017, the grease filter attaching projection 44 and the attaching/detaching device receiving recess 3017 function as a reverse attachment prevention mechanism for the grease filter (rotary body) 301 which prevents the grease filter (rotary body) 301 from being attached reversely by mistake.

[0050]

In Embodiment 2, while the attaching/detaching device receiving recess 3017 is provided in the grease filter (rotary body) 301, the attaching/detaching device receiving recess 3017 can also be implemented as an attaching/detaching device receiving projection and, in this case, a grease filter attaching recess is provided in the attaching/detaching device 40. In addition, the reverse attachment prevention can also be attained by providing the grease filter attaching projection or recess on the face of the rotary body hold device 50 which faces the grease filter (rotary body) 301 and allowing the grease filter attaching projection or recess to fit into a rotary body hold device receiving recess or projection of the grease filter (rotary body) 301.

[0051]

In addition, a recess and/or a projection may be provided on each of the side of the attaching/detaching device 40 of the grease filter (rotary body) 301 and the side of the rotary body hold device 50 thereof, and a recess and/or a projection is provided in each of the attaching/detaching device 40 and the rotary body hold device 50 so as to fit

into the recess and/or the projection mentioned above.

Further, the recess and/or the projection of the attaching/detaching device 40 and/or the rotary body hold device 50 which fits into the recess and/or the projection of the grease filter (rotary body) 301 may be any recess and/or any projection as long as the recess and/or the projection functions as the reverse attachment prevention mechanism, and the diameters thereof don't need to be completely equal to each other.

[0052]

#### D. Drive connecting part

As shown in Fig. 6 at (A), the attaching/detaching device 40 is configured such that the power shaft 20 is inserted into the boss tube power shaft insertion hole 433, and a plurality of pairs of drive pin receiving grooves 4311 are provided at the tip of the attaching/detaching device 40. The plurality of pairs of drive pin receiving grooves 4311 are configured such that one pair of the drive pins 201 can fit into the drive pin receiving grooves 4311 no matter in which circumferential direction the power shaft 20 is inserted into the boss tube power shaft insertion hole 433. A drive connecting part is configured by the drive pins 201 and the drive pin receiving grooves 4311.

[0053]

#### 2. Rotary body hold device

Fig. 9 is an exploded view of the rotary body hold device 50 according to Embodiment 2. A rotary body hold device case 502 is positioned on a side closest to the grease filter (rotary body) 301.

[0054]

#### A. Rotary body attaching/detaching mechanism

Although described later in detail, a rotary body attaching/detaching mechanism 501 pinches a boss tube 431 (not shown) with a boss tube retaining member (rod spring having clamp action) 5012 and retains the boss tube 431. In the case where the retainment is released, the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device is forcibly pushed into a boss tube retaining member opening part 5013, whereby the boss tube retaining member (rod spring having clamp action) 5012 is opened, and the retainment of the boss tube 431 is released.

[0055]

The boss tube 431 is a member which projects upwardly of the attaching/detaching device 40, and is a portion which extends over an area indicated by a one-dot chain line in a front view of the boss member 43 in Fig. 6 at(B). Fig. 10 at (A) shows an enlarged view of the boss tube 431 according to Embodiment 2. In addition, Fig. 10 at (B) is a perspective view showing a retaining relationship between the boss

tube 431 according to Embodiment 2 and the rotary body attaching/detaching mechanism 501.

[0056]

On the side of a boss tube tip part 4313 of the boss tube 431, a boss tube enlarging part 4315 is formed, and the drive pin receiving grooves 4311 are provided. In addition, a tapered face 4312 is provided immediately below the boss tube enlarging part 4315. In the case where the boss tube retaining member (rod spring having clamp action) 5012 retains the boss tube 431, as shown in Fig. 10 at (B), the boss tube retaining member (rod spring having clamp action) 5012 is provided so as to abut on the tapered face 4312, and pinches and retains the boss tube 431. This is the first function of the rotary body attaching/detaching mechanism 501 in Embodiment 2. The boss tube 431 is retained, whereby it is not possible to detach the grease filter (rotary body) 301 unless the rotary body hold device 50 is detached.

[0057]

The boss tube retaining member (rod spring having clamp action) 5012 clips the tapered face 4312, and hence its urging force used for the clipping generates a component of force on the tapered face 4312, the boss tube 431 of the attaching/detaching device 40 is thereby lifted in a direction indicated by an arrow in Fig. 10 at (B), and the boss tube retaining member (rod spring having clamp action) 5012 functions as an urging part which presses the grease filter (rotary body) 301 held with the rotary body hold device 50 toward the rotary body hold device 50.

This is the second function of the rotary body attaching/detaching mechanism 501 in Embodiment 2, and the rotary body attaching/detaching mechanism 501 has a function as the urging part which presses the grease filter (rotary body) 301 so as to prevent backlash of the grease filter (rotary body) 301. With the second function, the backlash of the grease filter (rotary body) 301 is prevented, and it is possible to suppress noises and unusual noises at the time of rotation.

The preferred angle  $\theta$  of the tapered face (see Fig. 10 at (A)) for attaining the second function is  $95^\circ$  to  $135^\circ$ .

[0058]

A description will be given of a relationship between members at the time of mounting by using Figs. 9, 10, and 11.

Fig. 11 is a conceptual diagram showing the relationship between the boss tube retaining member (rod spring having clamp action) 5012 and the boss tube tip part 4313 according to Embodiment 2.

The support member 503 shown in Fig. 9 retains the boss tube retaining

member (rod spring having clamp action) 5012 and the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device which configure the rotary body attaching/detaching mechanism 501, and is a member which presses and retains the boss tube retaining member (rod spring having clamp action) 5012 and the rotary body attaching/detaching mechanism operation part 5011 such that the boss tube retaining member (rod spring having clamp action) 5012 and the rotary body attaching/detaching mechanism operation part 5011 are not detached in the rotary body hold device case 502.

By inserting the boss tube 431 of the attaching/detaching device 40 to which the grease filter (rotary body) 301 is attached from a boss tube insertion hole 5021 of the case of the rotary body hold device 50 shown in Fig. 9, the rotary body hold device 50 is mounted. When the boss tube tip part 4313 is inserted from the boss tube insertion hole 5021 of the case, the boss tube tip part 4313 abuts on the boss tube retaining member (rod spring having clamp action) 5012 first. Next, when the boss tube tip part 4313 is further pushed in, the boss tube tip part 4313 passes through a boss tube insertion hole 5031 of the support member, and slightly protrudes above the rotary body hold device 50 from a boss tube insertion hole 5041 of the upper cover. This state corresponds to the state shown in Fig. 5 at (B).

[0059]

A detailed description will be given of how the boss tube retaining member (rod spring having clamp action) 5012 is mounted to the boss tube 431.

As shown in Fig. 11, in Embodiment 2, the boss tube retaining member (rod spring having clamp action) 5012 is a rod spring having a circular cross section. In a state in which the boss tube retaining member 5012 is not mounted to the attaching/detaching device 40 and the rotary body attaching/detaching mechanism operation part 5011 (Fig. 10 at (B)) of the rotary body hold device is not operated, a diameter  $a$  between circular lower ends of the cross section of the boss tube retaining member (rod spring having clamp action) 5012 is designed to be slightly larger than a diameter  $b$  of the boss tube tip part 4313.

[0060]

The boss tube retaining member (rod spring having clamp action) 5012 has a circular cross section. The circular boss tube retaining member (rod spring having clamp action) 5012 abuts on the curved face of the boss tube tip part 4313, is pushed and widened by continuously inserting the boss tube 431 into the rotary body hold device 50, and abuts on the boss tube enlarging part 4315. Even when the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device is

not pushed into the boss tube retaining member opening part 5013 and is not operated, the boss tube retaining member (rod spring having clamp action) 5012 is further enlarged along the boss tube enlarging part 4315 by continuously pushing the rotary body hold device 50 toward the attaching/detaching device 40, and retainment is performed by the boss tube retaining member (rod spring having clamp action) 5012 on the tapered face 4312 of the boss tube 431.

As described above, when the relationship of the diameter  $a >$  the diameter  $b$  is satisfied, it is not necessary to operate the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device at the time of mounting, and mounting is completed only by pushing the rotary body hold device 50 toward the attaching/detaching device 40, and hence mounting can be performed easily.

[0061]

#### B. Urging part which presses rotary body

In Embodiment 2, the rotary body attaching/detaching mechanism 501 has the first function and the second function, but the rotary body attaching/detaching mechanism 501 only needs to have the first function essentially, and does not need to have the second function.

In addition, the function (second function) as the urging part which presses the grease filter (rotary body) 301 may be provided by an urging part which is provided separately from the rotary body attaching/detaching mechanism 501.

[0062]

Fig. 12 is a conceptual diagram showing various implementations of the urging part according to Embodiment 2.

Fig. 12 at (A) shows a cushion type. A cushion is provided on the lower face of the rotary body hold device 50 and, when the rotary body hold device 50 is attached, the cushion functions as an urging part which presses the grease filter (rotary body) 301.

[0063]

Fig. 12 at (B) shows a leverage type, a lever lifting protrusion is provided on the upper face of the attaching/detaching device 40, and the lever lifting protrusion lifts the point of effort of a lever provided in the rotary body hold device 50. The point of load positioned on a side opposite to the point of effort beyond a fulcrum functions as an urging part which presses the grease filter (rotary body) 301.

The implementations of the urging part described above are illustrative, and the implementation of the urging part may be any implementation as long as the implementation functions as the urging part such as an implementation in which urging is performed with magnetic force by using a magnet, and is not limited to the

above examples.

[0064]

#### C. Annular groove of rotary body hold device

As described in “1. Attaching/detaching device, B. Engaging mechanism between rotary body and attaching/detaching device (boss member)” described above, in Embodiment 2, the protrusion insertion hole (engaging mechanism) 3016 is provided in the grease filter (rotary body) 301, and the protrusion (engaged mechanism) 434 on the upper face of the boss member 43 is configured to be inserted.

Fig. 13 is an exploded view showing a mounting relationship among the attaching/detaching device 40, the grease filter (rotary body) 301, and the rotary body hold device 50 according to Embodiment 2. The boss tube 431 protrudes from the attaching/detaching device insertion hole 3015 of the grease filter (rotary body) 301, and the protrusion (engaged mechanism) 434 of the attaching/detaching device 40 projects from the protrusion insertion hole (engaging mechanism) 3016 of the grease filter (rotary body) 301. An annular groove 505 which houses the projecting protrusion (engaged mechanism) 434 is provided on the face of the rotary body hold device 50 on the side of the grease filter (rotary body) 301. The annular groove 505 has advantageous action from the viewpoint of being able to house the protrusion (engaged mechanism) 434 irrespective of directions.

However, in the case where the grease filter (rotary body) 301 is to be prevented from rotating firmly, a recess in which the protrusion (engaged mechanism) 434 just fits may be provided in the rotary body hold device 50.

[0065]

Further, as described above, the protrusion (engaged mechanism) 434 may also be provided in the rotary body hold device 50 and, in this case, the annular groove is provided on the mounting face of the attaching/detaching device 40 to which the grease filter (rotary body) 301 is mounted.

With regard to placement of the protrusion (engaged mechanism) 434 provided in the attaching/detaching device 40, the protrusion (engaged mechanism) 434 may be placed with regularity such as placing the protrusion (engaged mechanism) 434 on the same circumference, but may also be placed without regularity. In this case, correspondingly to the placement of the protrusion (engaged mechanism) 434 projecting from the protrusion insertion hole (engaging mechanism) 3016 when the grease filter (rotary body) 301 is mounted to the attaching/detaching device 40, the placement of the annular groove 505 or the like in the bottom face of the rotary body hold device 50 which houses the protrusion (engaged mechanism) 434 is determined.

In addition, an engaging mechanism including a protrusion may be provided in the grease filter (rotary body) 301, and an annular groove which houses the protrusion or a recess in which the protrusion just fits may be provided in the attaching/detaching device 40 and/or the rotary body hold device 50.

Thus, the present invention encompasses various implementations.

[0066]

<Embodiment 3>

Embodiment 3 is another implementation of the rotary body hold device 50 of Embodiment 2.

Fig. 14 at (A) is a perspective view of the rotary body hold device 50 according to Embodiment 3, and Fig. 14 at (B) is a perspective view in which the upper cover 504 is removed.

The structure of the rotary body attaching/detaching mechanism 501 of Embodiment 3 is similar to the structure of the power shaft attaching/detaching mechanism described in “1. Attaching/detaching device, A. Power shaft attaching/detaching mechanism” of Embodiment 2 described above.

The rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device projects from the side of the rotary body hold device 50 according to Embodiment 3 shown in Fig. 14 at (A), an upper part is covered with the upper cover 504, and the boss tube insertion hole 5041 of the upper cover is provided in a central part.

As shown in the perspective view in Fig. 14 at (B) in which the upper cover 504 is removed, the rotary body attaching/detaching mechanism 501 is configured by a boss tube clipping lever 506 of the rotary body hold device including the rotary body attaching/detaching mechanism operation part 5011 and a lever spring 5062.

[0067]

Two boss tube clipping levers 506 of the rotary body hold device are provided in the rotary body hold device 50, and the lever spring 5062 is disposed in each of the two boss tube clipping levers 506 of the rotary body hold device. The two boss tube clipping levers 506 of the rotary body hold device are urged as indicated by arrows, and retain the boss tube 431 (not shown) inserted into boss tube insertion holes 5061 of the boss tube clipping levers from both sides. A clipping position of the two boss tube clipping levers 506 of the rotary body hold device is a portion immediately below the boss tube enlarging part 4315 shown in Fig. 10 at (A) and the boss tube 431 is clipped at this position, and hence the attaching/detaching device 40 is not detached.

[0068]

While the boss tube clipping levers 506 of the rotary body hold device may be allowed to have the function as the urging part which clips the boss tube at the position of the tapered face 4312 in Fig. 10 at (A), applies the urging force to the boss tube in the direction indicated by the arrow in Fig. 10 at (B), and presses the rotary body, as described in “2. Rotary body hold device, B. Urging part which presses rotary body” described above, the urging part which presses the rotary body may also be provided separately without providing the tapered face 4312 in the boss tube 431. In addition, an implementation in which the urging part which presses the rotary body is not provided can also be encompassed.

When the rotary body attaching/detaching mechanism operation parts 5011 of the rotary body hold device are pressed, an area where the boss tube insertion holes 5061 of the boss tube clipping levers formed in the two boss tube clipping levers 506 of the rotary body hold device overlap each other is enlarged, retainment of the boss tube 431 is released, and it becomes possible to detach the grease filter (rotary body) 301 by detaching the rotary body hold device 50 from the attaching/detaching device 40.

[0069]

<Embodiment 4>

Embodiment 4 is another implementation of the rotary body hold device 50 of Embodiment 2.

Fig. 15 at (A) shows a perspective view of the rotary body hold device 50 according to Embodiment 4, and Fig. 15 at (B) shows a perspective view in which the upper cover 504 is removed.

As shown in Fig. 15 at (A), the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device projects from the rotary body hold device 50.

Note that the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device is configured to project from the side face in Embodiment 4, but the portion of the rotary body attaching/detaching mechanism operation part 5011 may be any portion as long as the portion allows operation, and the rotary body attaching/detaching mechanism operation part 5011 may project from the top part of the rotary body hold device 50 in the present invention. In addition, the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device does not need to project as long as the rotary body attaching/detaching mechanism operation part 5011 thereof can be operated. The same applies to other operation parts such as the power shaft attaching/detaching mechanism operation part of the attaching device.

[0070]

Please refer to Fig. 15 at (B). The rotary body attaching/detaching mechanism 501 is configured by a boss tube retaining lever 507 including the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device and a boss tube retaining lever pressing spring 5071. The rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device is provided at one end of the boss tube retaining lever 507, the boss tube retaining lever pressing spring 5071 is mounted to the other end thereof, the boss tube retaining lever 507 is urged in a direction of an arrow by the boss tube retaining lever pressing spring 5071, and a boss tube abutting part 5073 of the boss tube retaining lever presses the boss tube 431 inserted into a boss tube insertion hole 5072 of the boss tube retaining lever at a position immediately below the boss tube enlarging part 4315 (see Fig. 10). With this, the boss tube 431 is retained. The shape of the boss tube insertion hole 5072 of the boss tube retaining lever is not a perfect circle, but a radius in a movement direction of the boss tube retaining lever 507 is long. When the shape thereof is a perfect circle, the boss tube 431 can be pulled out only when the positions of the boss tube enlarging part 4315 and the boss tube insertion hole 5072 of the boss tube retaining lever match each other, and hence it becomes difficult to adjust the degree of movement of the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device. However, as described above, the radius is long, and hence it is possible to detach the rotary body hold device 50 from the attaching/detaching device 40 without adjusting the degree of pushing strictly, and it is possible to detach the grease filter (rotary body) 301. [0071]

#### <Embodiment 5>

Fig. 16 at (A) is a perspective view of the rotary body mounting device 30 according to Embodiment 5, Fig. 16 at (B) is a perspective view in which the rotary body hold device 50 is detached, Fig. 16 at (C) is a perspective view of the attaching/detaching device 40, Fig. 16 at (D) is a perspective view when the rotary body hold device 50 is viewed from the side of the grease filter (rotary body) 301, and Fig. 16 at (E) is an enlarged perspective view of the grease filter (rotary body) 301.

In Fig. 16 at (A), the boss tube tip part 4313 of the attaching/detaching device 40 is seen. The rotary body mounting device 30 configured by the attaching/detaching device 40, the grease filter (rotary body) 301, and the rotary body hold device 50 is shown in the drawing.

[0072]

#### 1. Attaching structure between rotary body and attaching/detaching device

A state obtained by detaching the rotary body hold device 50 in a state of Fig.

16 at (A) is shown in Fig. 16 at (B). A hooking protrusion insertion hole (engaging mechanism) 3018 (Fig. 16 at (E)) is provided in the grease filter (rotary body) 301, and a hooking protrusion (engaged mechanism) 435 provided in the attaching/detaching device 40 is inserted, as shown in Fig. 16 at (B). As shown in Figs. 16 at (B) and 16 at (C), the hooking protrusion (engaged mechanism) 435 has a shape in which its tip is bent from the base toward the center of the grease filter (rotary body) 301. In the state in Fig. 16 at (B) in which the grease filter (rotary body) 301 is mounted to the attaching/detaching device 40, it can be seen that a gap is formed on the side of the boss tube 431 of the hooking protrusion insertion hole (engaging mechanism) 3018. As shown in Fig. 16 at (E), in the hooking protrusion insertion hole (engaging mechanism) 3018, the hooking protrusion (engaged mechanism) 435 abuts on a hooking protrusion abutting part 3019 at a position farthest from the center of the grease filter (rotary body) 301. A pair of the hooking protrusions (engaged mechanism) 435 abut on the hooking protrusion abutting parts 3019, and hence the gap described above is formed in each hooking protrusion insertion hole (engaging mechanism) 3018 at the time of mounting, but the hooking protrusion (engaged mechanism) 435 cannot move toward the gap.

[0073]

Thus, when the hooking protrusion (engaged mechanism) 435 provided in the attaching/detaching device 40 is inserted into the hooking protrusion insertion hole (engaging mechanism) 3018 provided in the grease filter (rotary body) 301, the grease filter (rotary body) 301 is prevented from rotating and cannot move in a rotation direction, and the backlash of the grease filter (rotary body) 301 is eliminated.

[0074]

After the hooking protrusion 435 is inserted into a hooking protrusion insertion part 509 of the rotary body hold device 50 shown in Fig. 16 at (D), the hooking protrusion 435 is hooked by rotating the rotary body hold device 50 to the side of a hooking protrusion hooking part 508, and the grease filter (rotary body) 301 is prevented from rotating more firmly.

[0075]

## 2. Rotary body attaching/detaching mechanism of rotary body hold device

Fig. 17 is a perspective view of the rotary body attaching/detaching mechanism 501 of the rotary body hold device 50 according to Embodiment 5, and does not show the grease filter (rotary body) 301 which has to be mounted usually in this state for the sake of convenience of explanation. In addition, members which are not necessary for explanation are omitted from the rotary body hold device 50 such that the internal part

of the rotary body hold device 50 can be seen.

The shape of the boss tube 431 of Embodiment 5 is different from those of Embodiments 2 to 4, and the boss tube 431 does not have the boss tube enlarging part 4315 and is cylindrical. In addition, in the boss tube 431, a fitting groove 436 is provided in a side face. The shape of the fitting groove 436 is shown in Fig. 16 at (C).

An attaching/detaching protrusion 512 of the rotary body hold device 50 fits into the fitting groove 436 provided in the boss tube 431 of the attaching/detaching device 40 in Fig. 17, whereby the attaching/detaching device 40 and the rotary body hold device 50 are fixed, and the grease filter (rotary body) 301 is retained between the attaching/detaching device 40 and the rotary body hold device 50. The shape of the attaching/detaching protrusion 512 is shown in Fig. 18.

[0076]

As shown in Fig. 17, the attaching/detaching protrusion 512 is linked to the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device by a link mechanism 511. In the rotary body attaching/detaching mechanism operation part 5011 of the rotary body hold device, an attaching/detaching protrusion urging spring 513 for urging in a direction of an arrow in the drawing is provided. It can be seen that the attaching/detaching protrusion urging spring 513 is urged in the direction of the arrow, and the attaching/detaching protrusion 512 linked by the link mechanism 511 is thereby urged to the fitting groove 436.

[0077]

### 3. Urging part which presses rotary body

In Embodiment 2, as shown in Fig. 10 at (B), the boss tube retaining member (rod spring having clamp action) 5012 clips the tapered face 4312, and hence the urging force used for the clipping generates the component of force on the tapered face 4312, and the urging part is configured to press the grease filter (rotary body) 301 in the direction indicated by the arrow, i.e., so as to pinch the grease filter (rotary body) 301 with the attaching/detaching device 40.

[0078]

In Embodiment 5, unlike Embodiment 2, the urging part which presses the grease filter (rotary body) 301 is configured by providing a backlash prevention protrusion 515. As shown in Fig. 16 at (D), the backlash prevention protrusion 515 is provided on the face of the rotary body hold device 50 on the side of the grease filter (rotary body) 301. Fig. 18 is a perspective view of a state in which members which are not necessary for explanation of the rotary body hold device 50 according to Embodiment 5 are detached, and each backlash prevention protrusion 515 is disposed

via a backlash prevention protrusion urging spring 516 and is urged in a direction of an arrow. With this, the backlash prevention protrusion 515 functions as the urging part which presses the grease filter (rotary body) 301. With this, the backlash of the grease filter (rotary body) 301 held between the attaching/detaching device 40 and the rotary body hold device 50 is prevented.

[0079]

In each of Embodiments described above, the description has been made by using the rotary body as the grease filter (rotary body) 301, but the rotary body may also be used as a fan used in a range hood. In addition, the present invention is a general-purpose technique which can be used in the rotary body other than that in the range hood.

[0080]

(Summary)

Thus, according to the present invention, it is possible to integrally attach and detach the rotary body mounting device including the rotary body and the attaching device to and from the power shaft and, in particular, in the case where the rotary body is placed at a high place such as a range hood, attachment work and detachment work are facilitated.

In addition, the rotary body attaching/detaching mechanism operation part which attaches and detaches the rotary body to and from the rotary body mounting device is provided on the side on which the power shaft is inserted and which cannot be reached usually, and hence disassembly and falling of the rotary body caused by operating the rotary body attaching/detaching mechanism operation part by mistake is averted.

[Reference Signs List]

[0081]

- |     |                                          |
|-----|------------------------------------------|
| 1   | Range hood                               |
| 4   | Grease filter drive motor (power device) |
| 5   | Bell mouth (oil collection member)       |
| 6   | Fan casing                               |
| 7   | Grease filter drive motor crosspiece     |
| 20  | Power shaft                              |
| 201 | Drive pin                                |
| 202 | Contracting part                         |
| 30  | Rotary body mounting device              |
| 301 | Grease filter (rotary body)              |

3011 Attaching device insertion hole  
 3015 Attaching/detaching device insertion hole  
 3016 Protrusion insertion hole (engaging mechanism)  
 3017 Attaching/detaching device receiving recess  
 3018 Hooking protrusion insertion hole (engaging mechanism)  
 3019 Hooking protrusion abutting part  
 302 Attaching device  
 303 Power shaft attaching/detaching mechanism operation part of attaching device  
 305 Power shaft insertion hole  
 306 Drive pin receiving groove  
 307 Rotary body attaching/detaching mechanism  
 3071 Rotary body attaching/detaching mechanism operation part of attaching device  
 3072 Rotary body pressing stopper  
 40 Attaching/detaching device  
 401 Power shaft attaching/detaching mechanism operation part of  
 attaching/detaching device  
 402 Power shaft retaining lever urging member  
 403 First power shaft retaining lever  
 404 Second power shaft retaining lever  
 405 Retaining lever power shaft insertion hole  
 406 Urging member abutting part  
 407 Power shaft abutting retaining part  
 41 Attaching/detaching device under cover  
 411 Power shaft tip abutting part  
 42 Support cover  
 421 Support cover power shaft insertion hole  
 43 Boss member  
 431 Boss tube  
 4311 Drive pin receiving groove  
 4312 Tapered face  
 4313 Boss tube tip part  
 4315 Boss tube enlarging part  
 433 Boss tube power shaft insertion hole  
 434 Protrusion (engaged mechanism)  
 435 Hooking protrusion (engaged mechanism)  
 436 Fitting groove

|      |                                                                                     |
|------|-------------------------------------------------------------------------------------|
| 44   | Grease filter attaching projection                                                  |
| 50   | Rotary body hold device                                                             |
| 501  | Rotary body attaching/detaching mechanism                                           |
| 5011 | Rotary body attaching/detaching mechanism operation part of rotary body hold device |
| 5012 | Boss tube retaining member (rod spring having clamp action)                         |
| 5013 | Boss tube retaining member opening part                                             |
| 502  | Rotary body hold device case                                                        |
| 5021 | Boss tube insertion hole of case                                                    |
| 503  | Support member                                                                      |
| 5031 | Boss tube insertion hole of support member                                          |
| 504  | Upper cover                                                                         |
| 5041 | Boss tube insertion hole of upper cover                                             |
| 505  | Annular groove                                                                      |
| 506  | Boss tube clipping lever of rotary body hold device                                 |
| 5061 | Boss tube insertion hole of boss tube clipping lever                                |
| 5062 | Lever spring                                                                        |
| 507  | Boss tube retaining lever                                                           |
| 5071 | Boss tube retaining lever pressing spring                                           |
| 5072 | Boss tube insertion hole of boss tube retaining lever                               |
| 5073 | Boss tube abutting part of boss tube retaining lever                                |
| 508  | Hooking protrusion hooking part                                                     |
| 509  | Hooking protrusion insertion part                                                   |
| 511  | Link mechanism                                                                      |
| 512  | Attaching/detaching protrusion                                                      |
| 513  | Attaching/detaching protrusion urging spring                                        |
| 515  | Backlash prevention protrusion                                                      |
| 516  | Backlash prevention protrusion urging spring                                        |

[CLAIMS]

[Claim 1]

A rotary body mounting device which is inserted into a power shaft, the rotary body mounting device comprising:

a rotary body; and

an attaching device, wherein the attaching device has:

an insertion hole into which the power shaft is inserted;

a drive connecting part which is connected to the power shaft;

a power shaft attaching/detaching mechanism operation part which attaches and detaches the rotary body mounting device to and from the power shaft on a side on which the power shaft is not inserted into the attaching device with the rotary body used as a reference; and

a rotary body attaching/detaching mechanism operation part which attaches and detaches the rotary body to and from the rotary body mounting device on a side on which the power shaft is inserted into the attaching device with the rotary body used as the reference.

[Claim 2]

The rotary body mounting device according to claim 1, wherein the attaching device includes an attaching/detaching device which has the power shaft attaching/detaching mechanism operation part and a rotary body hold device which has the rotary body attaching/detaching mechanism operation part.

[Claim 3]

The rotary body mounting device according to claim 2, wherein the attaching/detaching device includes a boss tube which is inserted into the rotary body, and

the rotary body attaching/detaching mechanism operation part of the rotary body hold device is provided so as to retain and release the boss tube.

[Claim 4]

The rotary body mounting device according to claim 2 or 3, wherein the attaching/detaching device and/or the rotary body hold device has an urging part which presses the rotary body.

[Claim 5]

The rotary body mounting device according to claim 4, wherein a tapered face which contracts toward a side of the rotary body is provided in the attaching/detaching device,

the urging part of the rotary body hold device is configured by an urging

member which pinches the tapered face, and

the urging part of the rotary body hold device is configured to function also as a rotary body attaching/detaching mechanism by providing an operation part which opens the urging member.

[Claim 6]

The rotary body mounting device according to any one of claims 2 to 5, wherein the rotary body has a recess and/or a projection on a mounting face to which the attaching/detaching device and/or the rotary body hold device is mounted, and a projection and/or a recess is provided in the attaching/detaching device and/or the rotary body hold device so as to fit into the recess and/or the projection.

[Claim 7]

The rotary body mounting device according to any one of claims 2 to 6, wherein the rotary body has at least one engaging mechanism, and the attaching/detaching device or the rotary body hold device has an engaged mechanism which engages with the engaging mechanism.

[Claim 8]

An oil collection device comprising:

the rotary body mounting device according to any one of claims 1 to 7;

a power device which rotates the rotary body mounting device; and

an oil collection member which collects oil.

[Claim 9]

A range hood comprising the rotary body mounting device according to any one of claims 1 to 7 or the oil collection device according to claim 8.