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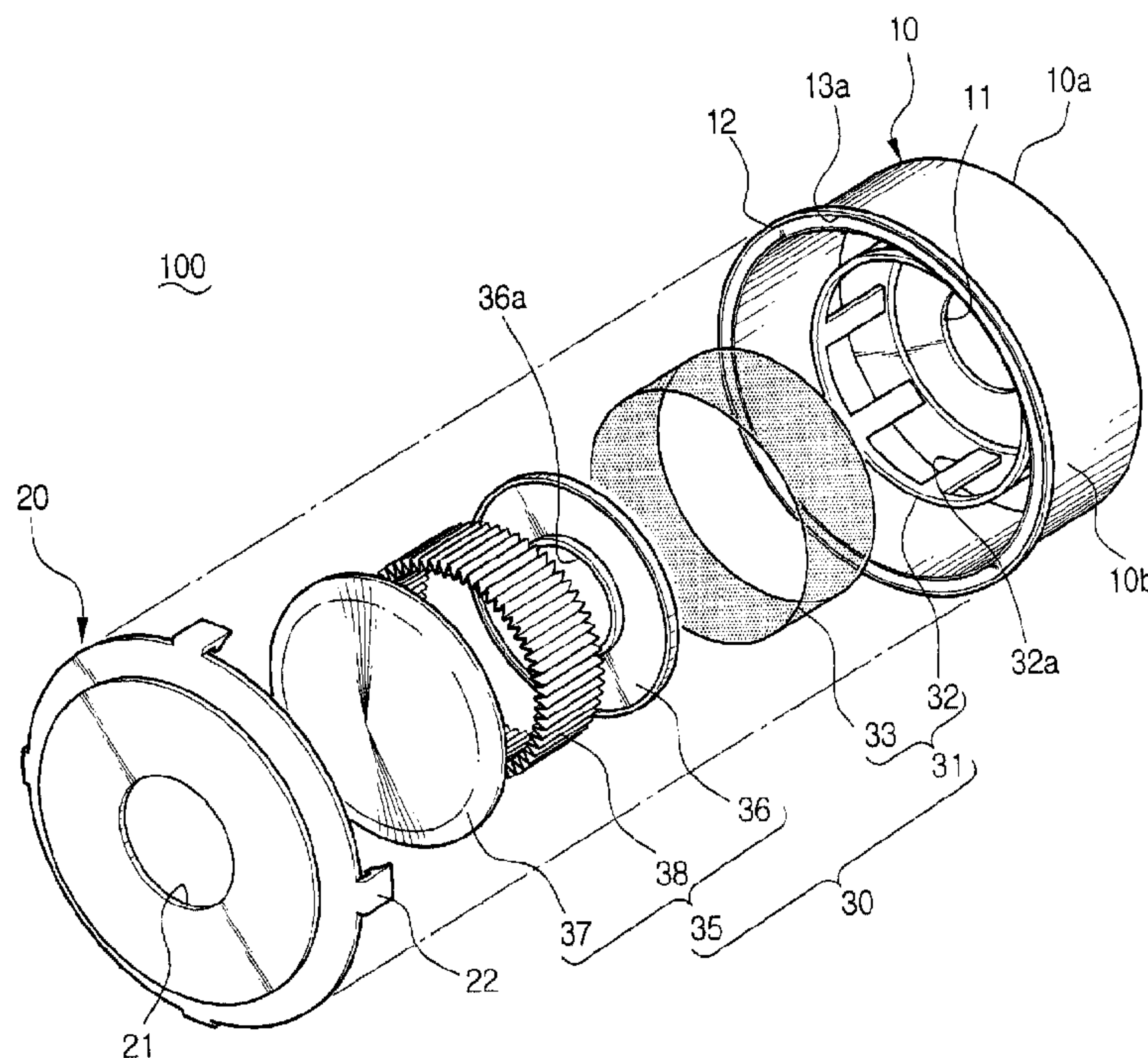
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(54) Titre : FILTRE DE DEPOUSSIERAGE POUR ASPIRATEUR, ET ASPIRATEUR MUNI DE CE FILTRE

(54) Title: DUST COLLECTING FILTER FOR VACUUM CLEANER AND VACUUM CLEANER HAVING THE SAME



(57) **Abrégé/Abstract:**

A dust collecting filter for an vacuum cleaner capable of being reused after being emptied and washed. The dust collecting filter comprises a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to thereby define a predetermined space therein, the backside surface having an air discharging hole formed therein to fluid-communicate with the air outlet, a cover having an air inflow hole fluid-communicating with the air inlet and reparably connected with the filter casing, and a dust filtering means mounted in the filter casing, for filtering dust from the air that is drawn in through the air inflow hole and discharged through the air discharging hole. Accordingly, since the dust collecting filter can be reused after being emptied and washed, it is not required to replace the dust collecting filter. Also, since the filter is designed to prevent the propagation of the bacteria, it can keep the cleanliness of the environment. Also, easy separation and mounting of the filter improves the convenience in using the cleaner.



ABSTRACT OF DISCLOSURE

A dust collecting filter for an vacuum cleaner capable of being reused after being emptied and washed. The dust collecting filter comprises a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to thereby define a predetermined space therein, the backside surface having an air discharging hole formed therein to fluid-communicate with the air outlet, a cover having an air inflow hole fluid-communicating with the air inlet and separably connected with the filter casing, and a dust filtering means mounted in the filter casing, for filtering dust from the air that is drawn in through the air inflow hole and discharged through the air discharging hole. Accordingly, since the dust collecting filter can be reused after being emptied and washed, it is not required to replace the dust collecting filter. Also, since the filter is designed to prevent the propagation of the bacteria, it can keep the cleanliness of the environment. Also, easy separation and mounting of the filter improves the convenience in using the cleaner.

DUST COLLECTING FILTER FOR VACUUM CLEANER AND VACUUM CLEANER HAVING THE SAME

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to a dust collecting filter for a vacuum cleaner, and more particularly, to a dust collecting filter that can be reused after being emptied and washed and a vacuum cleaner having the dust collecting filter.

10 2. Description of the Prior Art

Generally, a vacuum cleaner draws in dusts and various foreign substances (hereinafter called 'dust') from a surface to be cleaned together with air by using a suction force generated at a suction brush by a vacuum-generating device and separates and collects the dust from the drawn air by using a filter.

15 Such a filter generally uses a paper filter (paper bag). The paper filter is a consumable product, which is removed from the vacuum cleaner, and discarded together with the dust contained therein when it is full of the dust. Accordingly, such a disposable paper filter causes the maintenance cost of the vacuum cleaner to

be increased. Also, since the paper filter provides a condition where bacteria are easy to live and propagate, it cases a sanitary problem. Also, there is an inconvenience of having to frequently replace the paper filter.

5 SUMMARY OF THE INVENTION

The present invention has been developed in order to solve the above problems in the prior art. Accordingly, an object of the present invention is to provide a dust collecting filter for a vacuum cleaner that can be re-used after being emptied and washed so as to be usable.

10 Another object of the present invention is to provide a dust collecting filter for a vacuum cleaner which is hygienic because it does not allow the inhabitation of bacteria and is easily mounted in and removed from a dust collecting chamber of the vacuum cleaner.

Still another object of the present invention is to provide a vacuum cleaner
15 using the dust collecting filter having the above-described features, thereby contributing to a reduction of the maintenance cost and convenience of use.

The above objects of the present invention are achieved by providing a dust collecting filter for a vacuum cleaner mounted in a dust collecting chamber of the

vacuum cleaner having an air inlet and an air outlet, for filtering dust from air drawn in through the air inlet, the dust collecting filter comprising a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to thereby define a predetermined space therein, the backside surface
5 having an air discharging hole formed therein to fluid-communicate with the air outlet, a cover having an air inflow hole fluid-communicating with the air inlet and separably connected with the filter casing, and a dust filtering means mounted in the filter casing, for filtering dust from the air that is drawn in through the air inflow hole and discharged through the air discharging hole. The dust collecting filter can
10 be reused after being emptied and washed.

According to the present invention, since it is not required to replace the filter, the cost to replace the filter can be reduced. Also, since the filter is designed to prevent the propagation of the bacteria, it can keep the environment clean. Also, easy separation and mounting of the filter improves the convenience in using the
15 cleaner.

Preferably, the filter casing has a cylindrical shape and the filter casing and the cover are removably connected with each other by a projection portion and hooks respectively disposed at the filter casing and the cover and corresponding to

each other.

It is preferred that the dust filtering means comprises a first dust-filtering member for filtering a big-sized dust and a second dust-filtering member for filtering a minute dust that is not filtered by the first dust filtering means.

5 The first dust-filtering member comprises a frame integrally formed with the backside surface of the filter casing to section an inner space of the filter casing into an outer dust collecting portion and an inner air discharging portion, the frame having a plurality of holes being formed in a radial direction, and a net body attached to a side of the frame to enclose the holes of the frame.

10 Also, the second dust-filtering member comprises a first bracket contacting with the backside surface of the filter casing corresponding to the air discharging portion and having a passage hole formed in a center thereof to correspond to the air discharging hole, a second bracket supported by an end of the frame at an edge thereof, and a minute dust filter supported by circumference ends of the first and
15 the second brackets.

In here, it is preferred that the second bracket is formed in a conical shape that becomes gradually wider from a central point toward the other end, thereby allowing air drawn in through the air inflow hole of the cover to smoothly flow into

the dust collecting portion disposed in the filter casing.

Also, it is preferred that the minute dust filter is made of nonwoven fabric and the nonwoven fabric has a plurality of pleated portions to increase a dust filtering area.

5 Also, it is preferred that the cover is provided with a plurality of ribs protruding from an inside of the cover, the ribs pressing the second bracket supported by the end of the frame as the cover is connected with the filter casing.

Meanwhile, the above objects of the present invention are achieved by providing a vacuum cleaner comprising a cleaner body having a dust collecting
10 chamber provided with an air inlet and an air outlet and connected to a suction brush, a vacuum-generating device disposed in a driving chamber, for generating a negative pressure in the dust collecting chamber, the driving chamber disposed in a rear portion of the dust collecting chamber of the cleaner body to fluid-communicate with the dust collecting chamber through the air outlet, and a dust collecting filter
15 mounted in the dust collecting chamber, for filtering and collecting dust from air drawn into the dust collecting chamber, the dust-collecting filter being reusable.

The dust collecting filter comprises a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to

thereby define a predetermined space therein, the backside surface having an air discharging hole formed therein to fluid-communicate with the air outlet, a cover having an air inflow hole fluid-communicating with the air inlet and separably connected with the filter casing, and a dust filtering means mounted in the filter casing, for filtering dust from the air that is drawn in through the air inflow hole to be discharged through the air discharging hole.

BRIEF DESCRIPTION OF THE DRAWINGS

The above objects and the features of the present invention will be more apparent by describing a preferred embodiment of the present invention with reference to the accompanying drawings, in which:

FIG. 1 is an exploded perspective view showing a dust collecting filter for an vacuum cleaner according to a preferred embodiment of the present invention;

FIG. 2 is a perspective view showing the dust collecting filter of FIG. 1 in an assembled state;

FIG. 3 is a side section view showing the half of the interior of the dust collecting filter for the vacuum cleaner according to the preferred embodiment of the present invention;

FIG. 4 is a side section view showing the dust collecting filter for the vacuum cleaner performing the dust filtering operation according to the preferred embodiment of the preset invention;

FIG. 5 is a side section view showing the dust collecting filter mounted in a dust collecting chamber of the vacuum cleaner according to the preferred embodiment of the present invention; and

FIG.6 is a plan view showing the dust collecting filter of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A dust collecting filter for a vacuum cleaner according to a preferred embodiment of the present invention will be described in greater detail with reference to the accompanying drawings.

As shown in FIGS. 1 through 4, a dust collecting filter 100 for a vacuum cleaner according to a preferred embodiment of the present invention includes a filter casing 10, a cover 20, and a dust filtering means 30. The dust collecting filter 100 can be re-used even when the dust collecting filter 100 is full of dust by separating the cover 20 from the filter casing 10 and emptying and washing the filter casing 10. That is, the dust collecting filter 100 is reusable. The following

descriptions are made about respective elements of the dust collecting filters 100.

The filter casing 10 is formed in a cylindrical shape having a backside surface 10a and a side surface 10b vertically extended from the edge of the backside surface 10a. Accordingly, the filter casing 10 has a predetermined space defined therein.

5 The backside surface 10a is provided with an air-discharging hole 11 disposed approximately at a center thereof. The side surface 10b is provided with a projection portion 12 formed at the end thereof in a circumference direction. A groove 13a is formed inside the projection portion 12, for receiving an O ring 13.

The O ring 13 is for maintaining the airtightness when the cover 20 is connected with
10 the filter casing 10. The air-discharging hole 11 fluid-communicates with an air outlet 221 of a dust collecting chamber 210 of a cleaner body 200 when the dust collecting filter 100 is mounted in the dust collecting chamber 210 as shown in FIG. 5.

The reference numeral 230 of FIG. 5 indicates a driving chamber 230 in which a vacuum-generating device 300 is mounted. The dust collecting chamber 210 and the
15 driving chamber 230 are divided from each other by a partition 220 and fluid-communicate with each other through the air outlet 221 formed in the partition 220.

The reference numeral 211 of FIG. 5 indicates an air inlet 210 of the dust collecting chamber 210, which is connected to a suction hose of a suction brush (not shown).

The cover 20 is removably connected with the filter casing 10. The cover 20 is provided with an air inflow hole 21 formed approximately in a center thereof and a plurality of hooks formed at the edge of the cover 20 to hook the projection portion 12 of the filter casing 10. Due to the presence of the projection portion 12 and the hooks 22, the cover 20 is enabled to connect with and be separated from the filter casing 10. The air inflow hole 21 fluid-communicates with the air inlet 211 of the dust collecting chamber 210 when the dust collecting filter 100 is mounted in the dust collecting chamber 210 of the cleaner body 200 as shown in FIG. 5. Accordingly, when the vacuum-generating device 300 is driven, the dust-laden air is drawn into the dust collecting chamber 100 from the suction brush through the air inflow hole 21. Meanwhile, the cover 20 is provided with a plurality of ribs 23 protruding from an inside thereof, which will be described later.

The dust filtering means 30 is mounted in the filter casing 20, for filtering the dust from the dust-laden air that is drawn in through the air inflow hole 21 of the cover 20 and discharged through the air-discharging hole 11 of the filter case 10. The dust filtering means 30 includes a first dust-filtering member 31 for filtering big-sized dust and a second dust-filtering member 35 for filtering minute dust that is not filtered by the first dust-filtering member 31.

The first dust-filtering member 31 includes a frame 32 and a net body 33. The frame 32 is integrally formed with the backside surface 10a of the filter casing 10 to partition an inner space S of the filter casing 10 into an outer dust collecting portion S1 and an inner air discharging portion S2. The frame 32 has a plurality of
5 holes 32a formed in a radial direction. The net body 33 is attached to a side of the frame 32 to enclose the holes 32a of the frame 32. The air flowing through the air inflow hole 21 of the cover 20 is discharged through the dust collecting portion S1, the net body 33, the air discharging portion S2, and the air-discharging hole 11 of the filter casing 10. At this time, the dust entrained in the air is blocked by the net
10 body 33 and thus is separated from the air and collected in the dust collecting portion S1.

The second dust collecting member 35 includes first and second brackets 36 and 37 and a minute dust filter 38. The first bracket 36 contacts with the backside surface 10a of the filter casing 10 corresponding to the air discharging portion S2 of
15 the filter casing 10, and a passage hole 35a is formed in a center portion of the first bracket 36, corresponding to the air discharging hole 11. The second bracket 37 is supported on the end of the frame 32 at the edge thereof. Both ends of the minute dust filter 38 are supported on the circumference edges of the first and the second

brackets 36 and 37. In here, the minute dust filter 38 may be made of nonwoven fabric, which preferably has a plurality of pleated portions for increasing a dust filtering area. Also, the second bracket 37 is formed in a conical shape, i.e., becomes gradually wider from a central point toward the other end, and thus allows
5 smooth air flowing. That is, due to the presence of the conical second bracket 37, the air drawn in through the air inflow hole 21 of the cover 20 smoothly flows into the dust collecting portion S1 disposed inside the filter casing 10. Meanwhile, as the cover 20 is connected with the filter casing 10, the plurality of ribs 23 of the cover 20 press the second bracket 37 supported on the end of the frame 32, thereby
10 preventing the second bracket from being separated from its installation position.

The reference numeral 14 indicates an O ring for maintaining the airtightness between the backside surface 10a of the filter casing 10 and the first bracket 36. The O ring is fitted in a groove 14a formed along a portion of the backside surface 10a disposed adjacent to the frame 32.

15 Hereinbelow, the operations of a vacuum cleaner having the dust collecting filter according to the present invention as constructed above will be described with reference to FIGS. 5 and 6.

The dust collecting filter 100 as a main part of the present invention is

removably mounted in the dust collecting chamber 210 of the cleaner body 200 as shown in FIGS. 5 and 6. The air inflow hole 21 of the dust collecting filter 100 fluid-communicates with the air inlet 211 of the dust collecting chamber 210, and the air-discharging hole 11 of the dust collecting filter 100 fluid-communicates with the air
5 outlet 221 of the dust-collecting chamber 210.

When the vacuum-generating device 300 of the driving chamber 230 is driven for the cleaning operation, there occurs a negative pressure in the dust collecting chamber 210. Accordingly, due to the strong suction, the dust-laden air is drawn in from the cleaning surface into the dust collecting chamber 210 through the suction
10 brush (not shown).

The drawn air flows into the dust collecting filter 100 through the air inlet 211 of the dust collecting chamber 210 and the air inflow hole 21 of the dust collecting filter 100. Then, the air is guided to the dust collecting portion S1 of the filter casing 10 by the second bracket 37 of the second dust-filtering member 35, and
15 is discharged out through the net body 33 of the first dust-filtering member 31, the minute dust filter 38 of the second dust-filtering member 35, the air discharging portion S2, the air discharging hole 11 of the dust collecting filter 100, the air outlet 221 of the dust collecting chamber 210, and the driving chamber 230.

At this point, as the big-sized dust entrained in the air is blocked by the net body 33 of the first dust-filtering member 31, it is separated from the air and collected in the first dust-filtering member 31. The minute dust that is not filtered by the first dust-filtering member 31 is secondarily filtered by the minute dust filter 38 of the second dust-filtering member 35. Cleaned air is discharged out through the above-described discharging paths.

Meanwhile, when the dust collecting portion S1 of the filter casing 10 is full of the separated dust, the dust collecting filter 100 is removed from the dust collecting chamber 210 of the cleaner body 200, the cover 20 is separated from the filter casing 10 and then the filter casing 10 is emptied. Simultaneously, the second dust-filtering member 35 is also emptied. Next, after being washed and re-assembled, the dust collecting filter 100 is re-mounted in the dust collecting chamber 210 of the cleaner body 200 for reuse.

According to the present invention as described above, since the dust collecting filter 100 for filtering the dust from the drawn air can be reused, the cost for the replacement paper filter is reduced. Accordingly, the maintenance cost of the cleaner can be reduced.

Also, according to the present invention, since the dust collecting filter 100

is designed to prevent the propagation of the bacteria, it can keep the cleanliness of the environment. Also, easy separation and mounting of the dust collecting filter 100 improves the convenience in using the cleaner.

That is, the present invention provides the vacuum cleaner which is hygienic, 5 and contributes to the reduction of maintenance cost and improvement of user convenience. Accordingly, a highly satisfactory vacuum cleaner that satisfies the customer's needs can be provided.

Although a preferred embodiment of the present invention has been shown and described, it would be appreciated by those skilled in the art that changes may 10 be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

WHAT IS CLAIMED IS:

1. A dust collecting filter for a vacuum cleaner mounted in a dust collecting chamber of the vacuum cleaner having an air inlet and an air outlet, for filtering dust from air drawn in through the air inlet, the dust collecting filter being reusable, the
5 dust collecting filter comprising:

a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to thereby define a predetermined space therein, the backside surface having an air discharging hole formed therein to fluid-communicate with the air outlet;

10 a cover having an air inflow hole fluid-communicating with the air inlet and separably connected with the filter casing; and

a dust filtering means mounted in the filter casing, for filtering dust from the air that is drawn in through the air inflow hole and discharged through the air discharging hole.

15

2. The dust collecting filter for the vacuum cleaner of claim 2, wherein the filter casing has a cylindrical shape and the filter casing and the cover are removably connected with each other by a projection portion and hooks respectively disposed at

the filter casing and the cover and corresponding to each other.

3. The dust collecting filter for the vacuum cleaner of claim 1, wherein the dust filtering means comprises:

- 5 a first dust-filtering member for filtering a big-sized dust; and
- a second dust-filtering member for filtering a minute dust that is not filtered by the first dust filtering means.

4. The dust collecting filter for the vacuum cleaner of claim 3, wherein the first dust-filtering member comprises:

- 10 a frame integrally formed with the backside surface of the filter casing to section an inner space of the filter casing into an outer dust collecting portion and an inner air discharging portion, the frame having a plurality of holes being formed in a radial direction; and
- 15 a net body attached to a side of the frame to enclose the holes of the frame.

5. The dust collecting filter for the vacuum cleaner of claim 4, wherein the second dust-filtering member comprises:

a first bracket contacting with the backside surface of the filter casing corresponding to the air discharging portion and having a passage hole formed in a center thereof to correspond to the air discharging hole;

a second bracket supported by an end of the frame at an edge thereof; and

5 a minute dust filter supported by circumference ends of the first and the second brackets.

6. The dust collecting filter for the vacuum cleaner of claim 5, wherein the second bracket is formed in a conical shape that becomes gradually wider from a
10 central point toward the other end, thereby allowing air drawn in through the air inflow hole of the cover to smoothly flow into the dust collecting portion disposed in the filter casing.

7. The dust collecting filter for the vacuum cleaner of claim 5, wherein the
15 minute dust filter is made of nonwoven fabric and the nonwoven fabric has a plurality of pleated portions to increase a dust filtering area.

8. The dust collecting filter for the vacuum cleaner of claim 5, wherein the

cover is provided with a plurality of ribs protruding from an inside of the cover, the ribs pressing the second bracket supported by the end of the frame as the cover is connected with the filter casing.

5 9. A vacuum cleaner comprising:

a cleaner body having a dust collecting chamber provided with an air inlet and an air outlet and connected to a suction brush;

a vacuum-generating device disposed in a driving chamber, for generating a negative pressure in the dust collecting chamber, the driving chamber disposed in a rear portion of the dust collecting chamber of the cleaner body to fluid-communicate with the dust collecting chamber through the air outlet; and

a dust collecting filter mounted in the dust collecting chamber, for filtering and collecting dust collecting filter from air drawn into the dust collecting chamber, the dust- collecting filter being reusable,

15 the dust collecting filter comprising,

a filter casing having a backside surface and a side surface vertically extended from an edge of the backside surface to thereby define a predetermined space therein, the backside surface having an air discharging

hole formed therein to fluid-communicate with the air outlet;

a cover having an air inflow hole fluid-communicating with the air inlet and separably connected with the filter casing; and

a dust filtering means mounted in the filter casing, for filtering dust
5 from the air that is drawn in through the air inflow hole and discharged through the air discharging hole.

10. The vacuum cleaner of claim 9, wherein the filter casing has a cylindrical shape and the filter casing and the cover are removably connected with each other
10 by a projection portion and hooks respectively disposed at the filter casing and the cover and corresponding to each other.

11. The vacuum cleaner of claim 9, wherein the dust filtering means comprises:

15 a first dust-filtering member for filtering a big-sized dust filtering means;
and

a second dust-filtering member for filtering a minute dust filtering means that is not filtered by the first dust filtering means.

12. The vacuum cleaner of claim 11, wherein the first dust-filtering member comprises:

5 a frame integrally formed with the backside surface of the filter casing to section an inner space of the filter casing into an outer dust collecting portion and an inner air discharging portion, the frame having a plurality of holes being formed in a radial direction; and

a net body attached to a side of the frame to enclose the holes of the frame.

10 13. The vacuum cleaner of claim 12, wherein the second dust-filtering member comprises:

a first bracket contacting with the backside surface of the filter casing corresponding to the air discharging portion and having a passage hole formed in a center thereof and corresponding to the air discharging hole;

15 a second bracket supported by an end of the frame at an edge thereof; and

a minute dust filter supported by circumference ends of the first and the second brackets.

14. The vacuum cleaner of claim 13, wherein the second bracket is formed in a conical shape that becomes gradually wider from a central point toward the other end, thereby allowing air drawn in through the air inflow hole of the cover to smoothly flow into the dust collecting portion disposed in the filter casing.

5

15. The vacuum cleaner of claim 13, wherein the minute dust filter is made of nonwoven fabric, and the nonwoven fabric has a plurality of pleated portions to increase a dust filtering area.

10

16. The vacuum cleaner of claim 13, wherein the cover is provided with a plurality of ribs protruding from an inside of the cover, the ribs pressing the second bracket supported by the end of the frame as the cover is connected with the filter casing.

FIG. 1

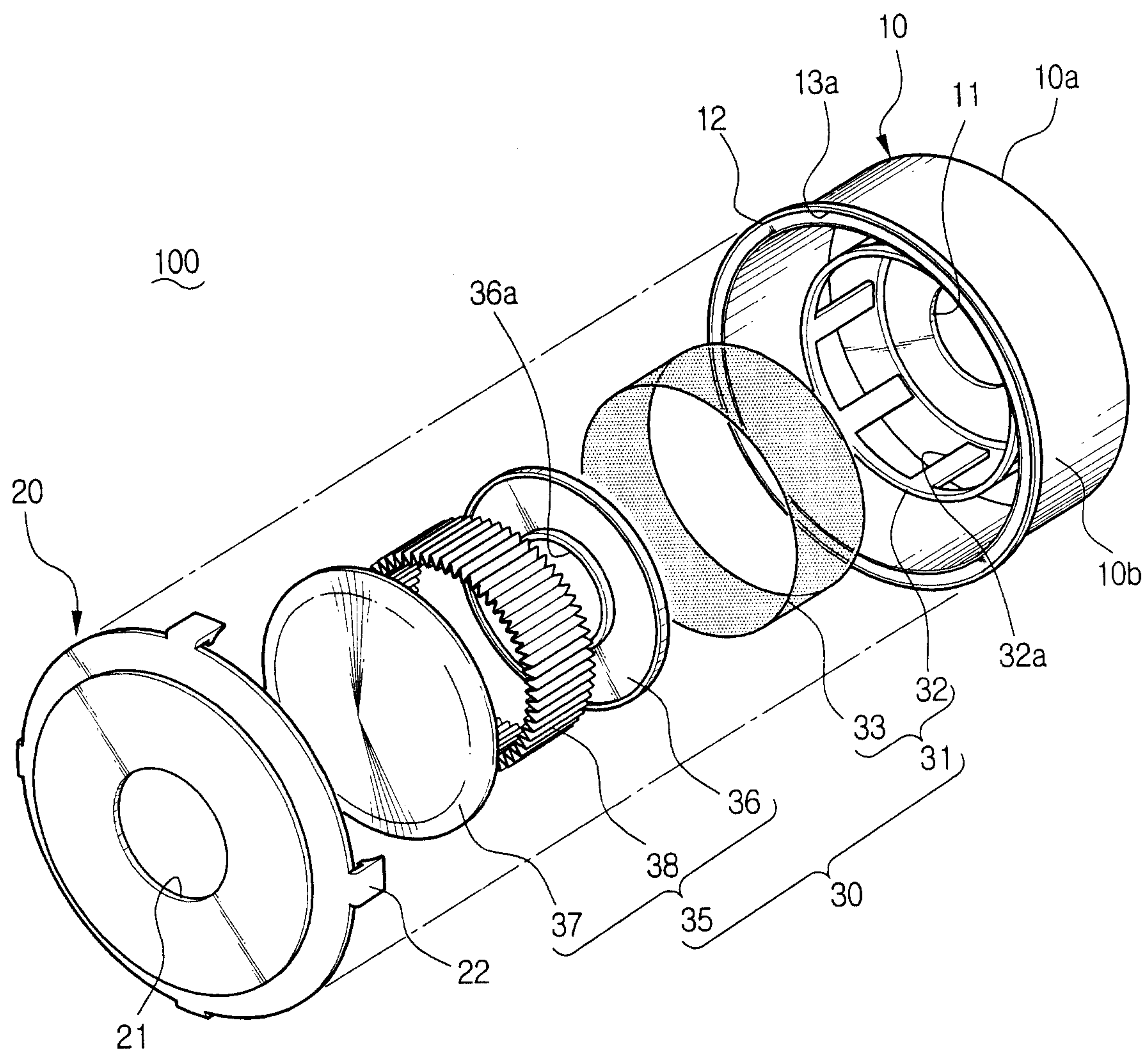


FIG.2

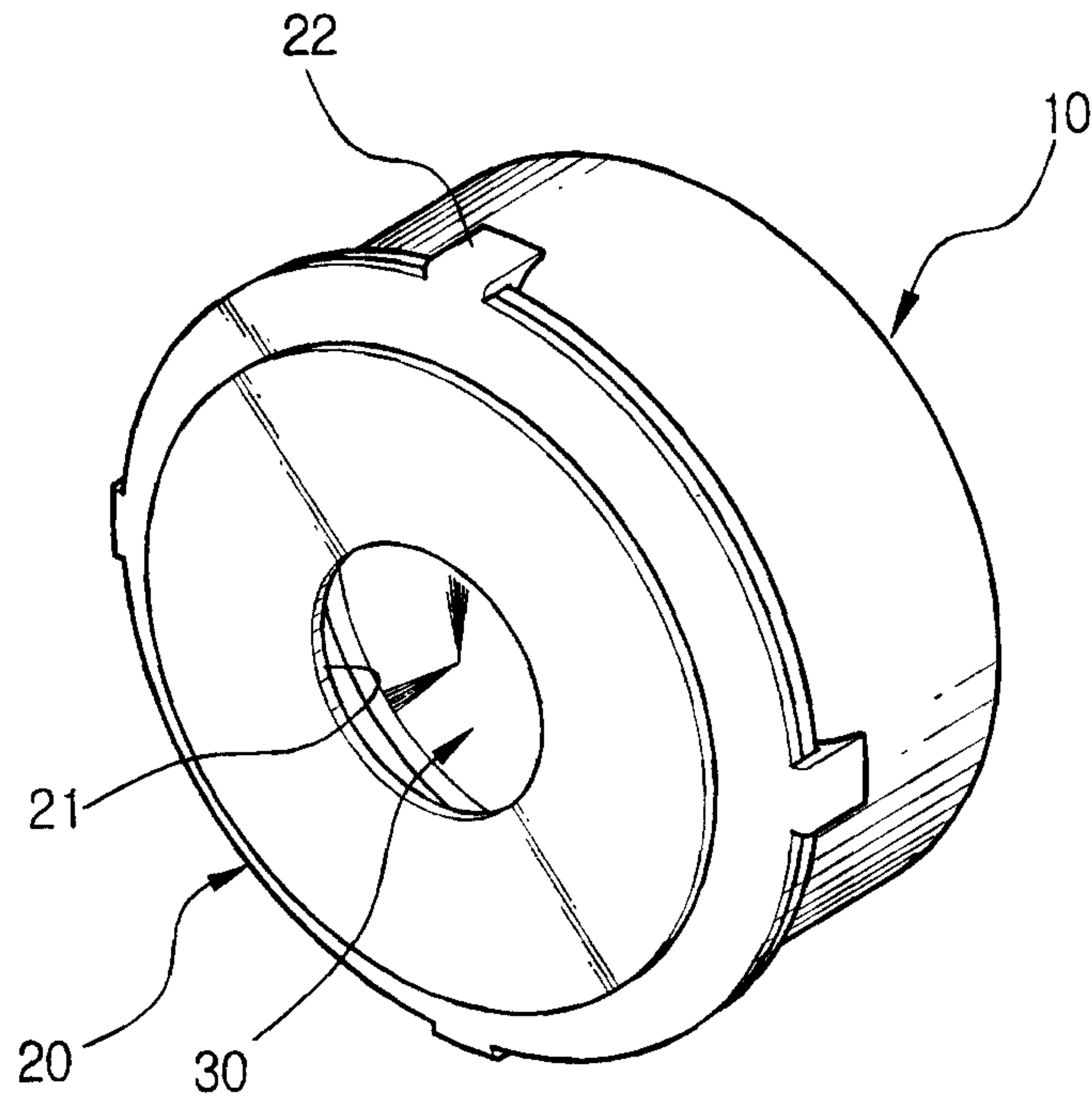


FIG.3

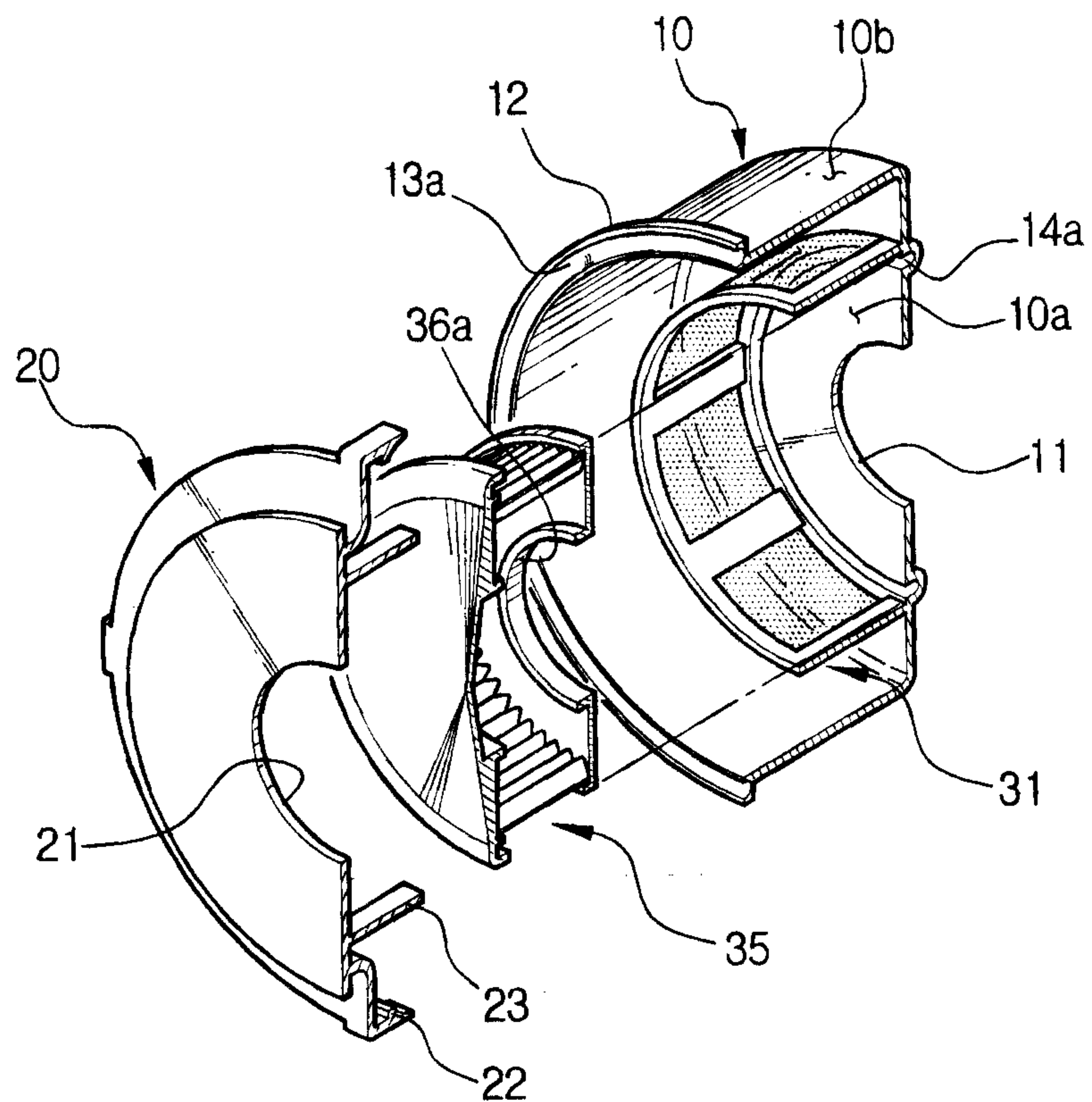


FIG. 4

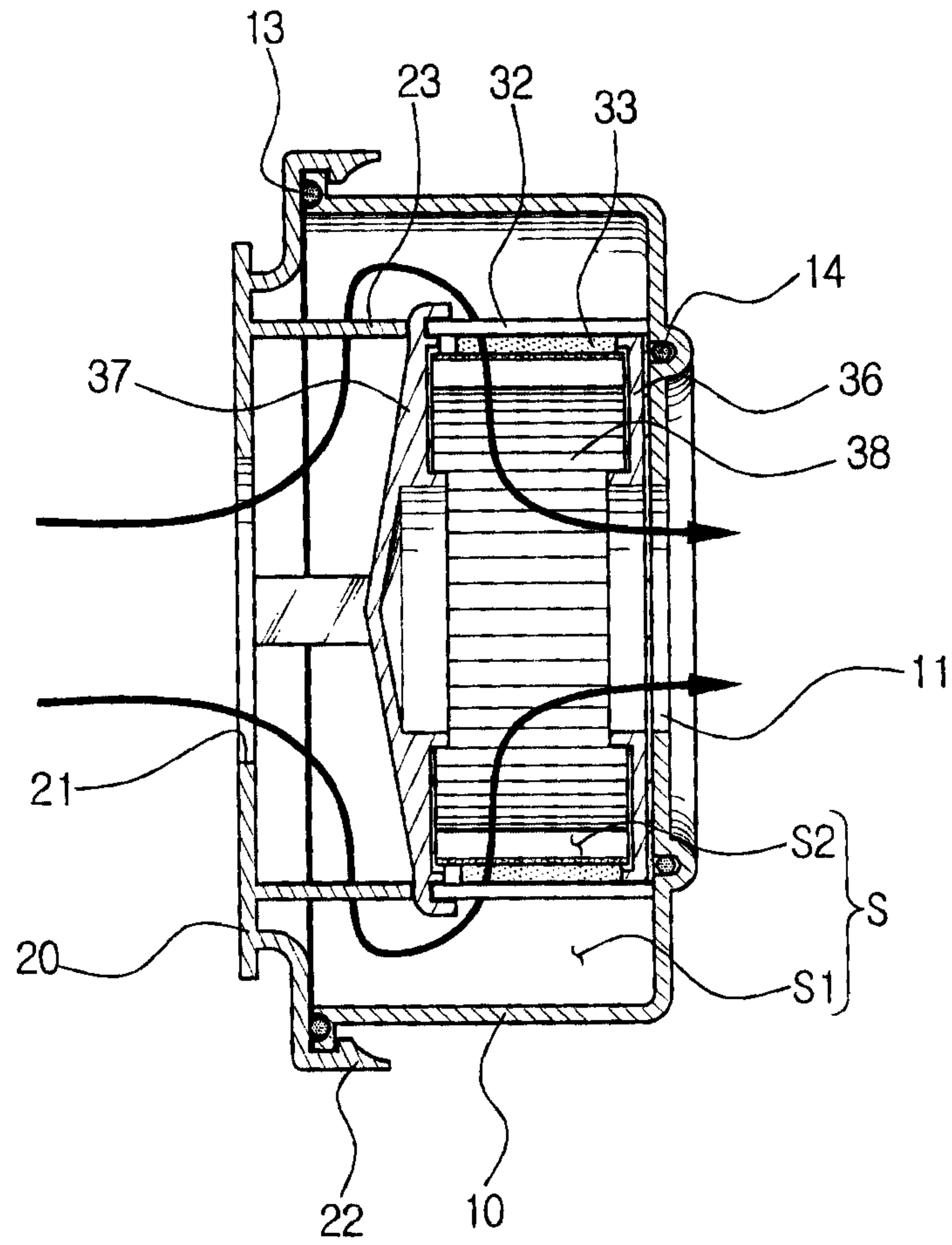


FIG.5

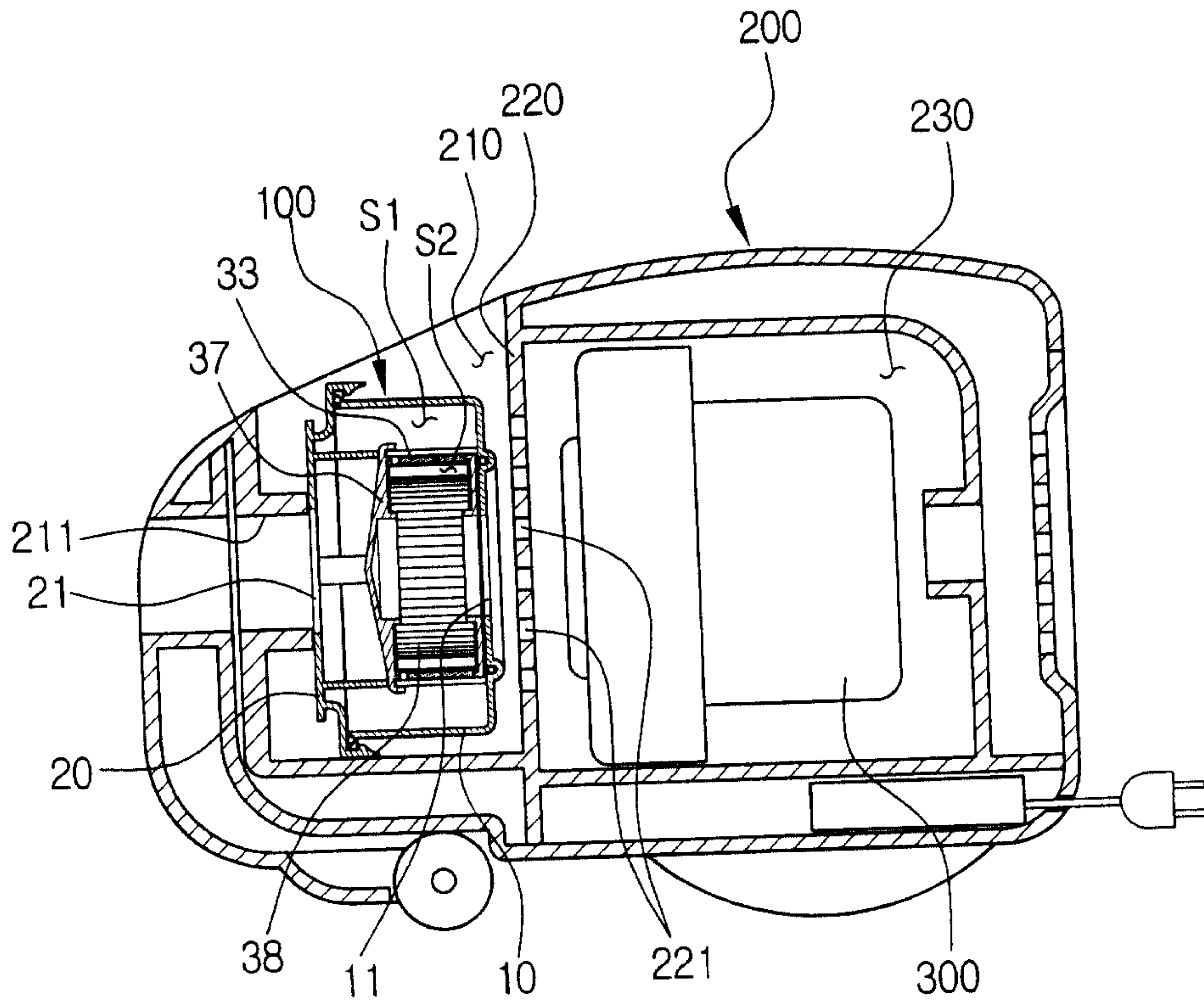


FIG.6

