(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 127 582 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.12.2009 Bulletin 2009/49

(51) Int Cl.:
A47L 9/06 *(2006.01)*

(21) Application number: **09007023.6**

(22) Date of filing: **26.05.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

(30) Priority: **30.05.2008 CN 200810109818**

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(54) Suction head for vacuum cleaner

(57) The present invention relates to a suction head for vacuum cleaner, comprising: a tube section (11); a first joint section (12) for connecting with a first connecting tube, which is disposed at the front end portion of the tube section (11); a second joint section (13) for connecting with a second connecting tube, which is disposed at the rear end portion of the tube section (11); a suction section (14) which extends from the exterior wall of the tube section (11) toward the front end of the tube section (11) so as to cover the first joint section (12); a suction inlet (15) disposed at the front end of the suction section (14); and a hairbrush (16) formed by hair-planting at the edge of the suction inlet (15). The present suction head for vacuum cleaner may be used to clean the corners of a room in the same way as a conventional small suction head, and the suction head for vacuum cleaner may be connected with a floor suction head at its front end without removing the suction head for vacuum cleaner. The convenience of replacing suction head frequently may be avoided, and thus both the convenience in use and cleaning efficiency are improved considerably.

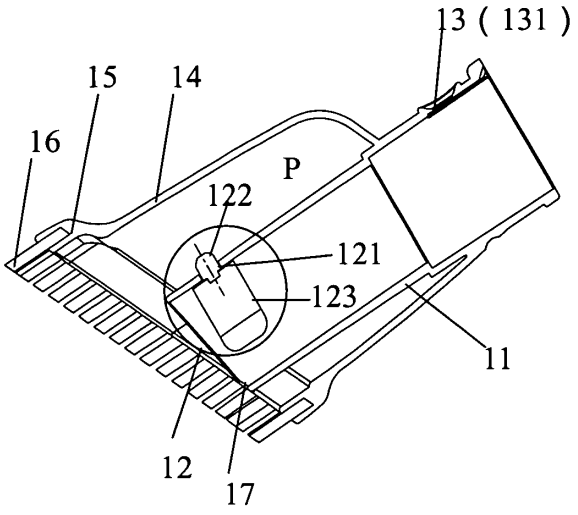

Fig. 2

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Description

Technical field

[0001] The present invention relates to a suction head for vacuum cleaners.

Background

[0002] In traditional vacuum cleaners, a floor suction head is connected with the vacuum cleaner body through plurality of extension tubes and hoses for cleaning a floor. However, in cleaning the corners of a room, a user generally needs to remove the floor suction head to replace it with a small suction head. In particular, in cleaning a large room (e.g., an office or a meeting room), the user need to hold a small suction head as he cleans the floor to replace the suction head when encountering a corner. This causes great inconvenience in use.

Summary of the invention

[0003] The present invention is made in view of the above problem, and aims to provide a suction head for vacuum cleaner that functions as a small suction head. Further, the small suction head is connected directly with the front end of a floor suction head, and may be used for cleaning corners after removing the floor suction head, without any action of replacing. Moreover, the user's inconvenience of holding a small suction head at the time of cleaning may also be avoided, and thus convenience in use and cleaning efficiency are both improved considerably.

[0004] The suction head for vacuum cleaner of the present invention comprises: a tube section; a first joint section for connecting with a first connecting tube, which is disposed at the front end portion of the tube section; a second joint section for connecting with a second connecting tube, which is disposed at the rear end portion of the tube section; a suction section which extends from the exterior wall of the tube section toward the front end of the tube section so as to cover the first joint section; a suction inlet disposed at the front end of the suction section; and a hairbrush formed by hair-planting at the suction inlet.

[0005] With this structure, not only may the suction head for vacuum cleaner be used to clean the corners of a room in the same way as a conventional small suction head, but the suction head for vacuum cleaner may be connected with a floor suction head at its front end without removing the suction head for vacuum cleaner. The inconvenience of replacing the suction head frequently may be avoided, and thus the convenience in use and the cleaning efficiency are both considerably improved.

[0006] Further, in the suction head for vacuum cleaner of the present invention, preferably, hair-planting is carried out at the end portion of the suction inlet parallel with the axial line of the tube section to form a hairbrush. More preferably, the suction inlet is disposed to be inclined relative to the axial line of the tube section, and the end of hairbrush is cut such that it is in parallel with the plane in the opening of the suction inlet for more effective cleaning of corners.

[0007] Further, in the suction head for vacuum cleaner of the present invention, preferably, the front end portion or part thereof of the tube section is cut parallel with the inclined surface of the suction inlet, such that the suction section is entirely covered in said suction section. Accordingly, when the suction head of the present invention is used as a small suction head, it is not interfered with the cleaning surface due to the tube section covered in the suction section.

[0008] Further, in the suction head for vacuum cleaner of the present invention, preferably, the first joint section comprises: a first through hole formed at the front end portion of the tube section, a first fixing pin protruding a specified length from the interior side of the tube section through the first through hole, and a first elastomer disposed at the interior side of the tube section and applying an elastic force to the first fixing pin towards the exterior side of the first through hole. With this structure, the suction head for vacuum cleaner may be connected fixedly with the connecting tube of a floor suction head, and reliability may be ensured.

[0009] Moreover, in the above preferable suction head for vacuum cleaner, a release space is formed in the suction section and above the aforesaid first joint section above, such that a user may conveniently release the connection with the connecting tube for a floor suction head.

[0010] Further, still preferably in the suction head for vacuum cleaner of the present invention, a first joint hole is formed at the end of the first connecting tube being connected with the tube section at the front end portion of the tube section. After being inserted into the tube section at the side of the suction section, the first fixing pin protrudes from the first joint hole so as to fasten the first connecting tube and the tube section. With a connecting tube or extension tube for a floor suction head being connected with the front end portion of the suction head for vacuum cleaner having this structure, a stable connection may be realized.

[0011] Similarly, preferably, the second joint section of the suction head for vacuum cleaner is formed as a second joint hole disposed at the rear end portion of the tube section. Moreover, the front end of the second connecting tube being connected with the tube section at the rear end portion of the tube section comprises: a second through hole formed at the front end portion of the second connecting tube, a second fixing pin protruding a specified length from interior side of the second connecting tube through the second through hole, and a second elastomer disposed at the interior side of the second connecting tube and applying an elastic force to the second fixing pin towards the exterior side of the second through hole. Similar to the aforesaid structure, this structure may

stably connect the suction head for vacuum cleaner with a rear connecting tube or a hose for vacuum cleaner.

[0012] Further, for ensuring a stable connection, more preferably, the first joint section further comprises: ribs parallel with the axial line of the tube section and protruding outwards and which are formed on the peripheral surface of the tube section being covered by the suction section, and grooves interlocked with plurality of ribs which are disposed on the inner surface of the rear end portion of the first connecting tube. More preferably, the plurality of ribs are arranged in bilateral symmetry relative to the axial line of the tube section, and the present suction head are formed with grooves arranged to correspond to the plurality of ribs. Moreover, more preferable, the external diameter of the front end portion of the tube section is smaller than the external diameter of its rear end portion, and the external diameter of the front end portion of the tube section is smaller than the external diameter of the first connecting tube, and the ribs and the grooves fit tightly.

Description of Figures

[0013]

Fig. 1 is a perspective view showing the construction of the suction head for vacuum cleaner in the present invention.

Fig. 2 is a sectional view along the line A-A of Fig. 1 showing the construction of the suction head for vacuum cleaner in the present invention.

Fig. 3 is a structure diagram of the connection between the suction head for vacuum cleaner and the floor suction head in the present invention.

Fig. 4 is a structure diagram of the connecting tube in the present invention.

Fig. 5 shows an integral schematic of a vacuum cleaner as a whole in the present invention.

Detailed Description

[0014] Hereinafter, the embodiments of the suction head for vacuum cleaner of the present invention will be described in details.

[0015] Fig. 1 is a perspective view showing the construction of the suction head for vacuum cleaner of the present invention. Fig. 2 is a sectional view along the line A-A of Fig. 1 showing the construction of the suction head for vacuum cleaner of the present invention. As shown in the figures, the suction head for vacuum cleaner of the present invention comprises: a tube section 11; a first joint section 12 for connecting with an extension tube or connecting tube for floor suction head, which is disposed at the front end portion of the tube section 11; a second joint section 13 for connecting with the extension tube or hose for vacuum cleaner, which is disposed at the rear end portion of the tube section 11; a suction section 14 which extends from the exterior wall of the tube section 11 toward the front end of the tube section 11 so as to cover the first joint section 12; a suction inlet 15 disposed at the front end of the suction section 14; and a hairbrush 16 formed by hair-planting at the edge of the suction inlet 15. The suction head for vacuum cleaner of the above construction may be connected with an extension tube or hose for vacuum cleaner using a second joint section, and is held in the user's hand for cleaning wall corners, sofas, etc.

[0016] Hereinafter, the specific construction and each part thereof, and connection structure and advantages thereof are described in detail for the suction head for vacuum cleaner in accordance with the present invention. However, the present invention is not limited to the following description, and a person skilled in this art can make various improvements and alterations on its basis.

[0017] As in the side view as shown in Fig. 2, the suction section 14 covers the front end portion of the entire tube section 11. Further, the suction head for vacuum cleaner may have the same function as that of the suction head for vacuum cleaner in the prior art by disposing a hairbrush 16 on the suction inlet 15. At the same time, with the above structure, the suction head for vacuum cleaner may be further connected with an extension tube or eduction tube for floor suction head at its front end, such that the user does not necessarily replace the suction head in use for cleaning corners. The user may simply remove the floor suction head or the extension tube directly connected with the floor suction head from the front end of the suction head for vacuum cleaner of the present invention in order to clean a corner. After cleaning the corner, the user may connect the extension tube or eduction tube for the floor suction head again so as to clean the floor. Therefore, the inconvenience of replacing a suction head may be avoided. Furthermore, working efficiency is considerably improved. This will be described in more detail below.

[0018] Further, in this embodiment, the suction inlet 15 of the suction head for vacuum cleaner is disposed to be inclined relative to the axial line of the tube section 11. Hair-planting is carried out at the edge of the suction inlet 15 parallel with the tube section 11 to form a hairbrush 16. The hairbrush 16 is cut such that it is parallel with the plane in the opening of the suction inlet 15. Accordingly, the contact area between the hairbrush 16 and the corner may be increased, and the tube section may be tilted in cleaning, which is advantageous to reach deeply into the corner, and is convenient for the user to operate. Although the suction inlet 15 is disposed to be inclined relative to the tube section 11 to form the hairbrush 16 in this embodiment, the suction inlet 15 may be not inclined and an airbrush may be alternatively formed by direct hair-planting.

[0019] In order to prevent the tube section 11 covered in the suction section 14 from moving on the cleaning surface during cleaning with the suction head for vacuum cleaner of the present invention, the tube section 11 is not exposed to the suction inlet 15. As described below,

however, the length of the portion connecting the vacuum cleaner at the suction head side with the connecting tube or the extension tube for floor suction head may be reduced, thereby affecting the connectiion stability. Therefore, in this embodiment, the part of the tube section 11 exceeding the suction inlet 15 is cut off to form a corner cut 17 so as to ensure that the tube section 11 is entirely covered in the suction section 14. Alternatively, the front end of the tube section 11 may be cut parallel with the plane in the opening of the suction inlet 15 while ensuring the connection stability.

[0020] In this embodiment, the first joint section 12 is constructed as follows in order to be connected with the connecting tube or extension tube for the floor suction head as described below. The first joint section 12 comprises: a through hole 121 (a first through hole) formed at the front end portion of the tube section 11, a fixing pin 122 (a first fixing pin) protruding a specified length from interior side of the tube section 11 through the through hole 121, and an elastomer 123 (a first elastomer) disposed at the interior side of the tube section 11 and applying an elastic force to the fixing pin 122 in a direction outwards to 121. As a result, the fixing pin 122 extrudes from the through hole 121 to the exterior side of the tube section 11 on the action of the elastomer 123, and may be pressed to be even with the external surface of the tube section 11 when applying an outer force from the exterior side, and thereby is connected with the connecting tube or the extension tube for the floor suction head as described blow. The arrangement relationship between the elastomer 123 and the fixing pin 122 is not limited. As shown in this embodiment, an elastic plate imbedded in the tube section 11 and bending in its circumferential direction may be used as the elastomer 123, and the fixing pin 122 is disposed at the bending center. Alternatively, an elastic plate disposed at the interior side of the tube section 11 and fixed at one or both ends in the axial direction of the tube section may be used, and the fixing pin 122 is disposed on the elastic plate.

[0021] Further, it is necessary to connect an extension tube or a hose at the rear portion of the suction head for vacuum cleaner in order to connect the suction head for vacuum cleaner of this embodiment with the vacuum cleaner body. A second joint section 13 is further disposed at the rear end portion of the tube section 11 for ensuring a firm connection. The second joint section 13 is formed as a through hole 131 (a second joint hole) disposed on the wall of the tube section 11. The through hole 131 may be used for connection with the end portion of the extension tube or hose as described below to ensure connecting stability.

[0022] Further, in this embodiment, as the suction section 14 extends from the tube section 11, the portion of the suction section 14 covering the first joint section 12 protrudes more, such that a release space P is formed. The release space P may improve the convenience of removal when being connected with the connecting tube for a floor suction head described hereinafter.

[0023] Hereinafter, the connection between the above suction head for vacuum cleaner and the connecting tube or extension tube for a floor suction head connected at its front portion will be described for details.

[0024] As shown in Fig. 3, the above suction head 1 for vacuum cleaner may be connected with a floor suction head 2 for cleaning of the floor, wherein, the floor suction head 2 comprises a connecting tube 21 connected with the front end of the suction head 1 for vacuum cleaner and a joint releasing section 22 for releasing the joint with the first joint section of the suction head for vacuum cleaner.

[0025] A joint hole 212 (a first joint hole) is formed at the upper portion of the rear end of the connecting tube 21 for insertion of a fixing pin 122. The suction head 1 for vacuum cleaner and the floor suction head 2 may be connected fixedly by inserting the front end of the tube section 11 into the connecting tube 21 and pushing the fixing pin 122 into the joint hole 212 by the action of elastic force. This structure may be used to ensure the stability of the connection with the floor suction head 2.

[0026] Further, in the present invention, as shown in Figs. 1 and 4, ribs 113 parallel with the axial line of the tube section 11 and protruding outwards are formed on the peripheral surface of the tube section 11 being surrounded by the suction section 14. As shown in Fig. 4, grooves 213, interlocked respectively with plurality of ribs 113, are formed on the inner surface of the rear end portion of the connecting tube 21 inserted with a tube section 11, which correspond to the plurality of ribs 113 formed on the tube section 11. As the tube section 11 and the connecting tube 21 are connected, the relative rotation between the tube section 11 and the connecting tube 21 may be restricted by interlocking the ribs 113 and the grooves 213. Accordingly, the connection may be more stable, and force applied to the first joint section 12 may be reduced to ensure a long duration of this structure.

[0027] Further, as shown in Figs. 1 and 4, plurality of ribs 113 and plurality of grooves 213 are arranged on the outer wall of the front end portion of the tube section 11 and the inner wall of the connecting tube 21, respectively, in bilateral symmetry. Accordingly, a uniform stress may be ensured to cause the suction head for vacuum cleaner durable, as compared with the situation in which if only one pair of rib 113 and groove 213 is arranged.

[0028] Further, when releasing the connection, the joint releasing section 22 may be pushed deeply into the joint hole 212 by pressing down the footplate 23 of the joint releasing section 22, and thereby the suction head 1 for vacuum cleaner may be removed, and the suction head 1 for vacuum cleaner may be used for cleaning. Accordingly, the operational convenience may be improved considerably.

[0029] Since a release space P is formed in the suction head 1 for vacuum cleaner, the structure of a joint releasing section 22 as shown in Fig. 3 may be accommodated. Even if no joint releasing section 22 is disposed separately, by forming a contacting space P' large enough, or

alternatively disposing a contacting space P' at the inclined side of rear end of the suction inlet 15 and disposing a first joint section 12 at the side opposite to the position as shown in Fig. 2 relative with the axial line of the tube section 11, a user can press the fixing pin 122 by deeply entering into the release space P' by hand so as to release the connection with the floor suction head 1.

[0030] Fig. 5 shows an integral schematic of the vacuum cleaner formed in the present invention.

[0031] The joint structure of an extension tube 3 (a second extension tube) connected with the suction head 1 for vacuum cleaner at its rear portion may have a structure similar to the structure of the aforesaid first joint section at the front end, i.e., a through hole (a second through hole) disposed at the front end of the rear extension tube 3, a second fixing pin protruding from the interior side of the rear extension tube 3 through the second through hole, and a second elastomer disposed at the interior side of the rear extension tube and applying an elastic force to the second fixing pin in a direction outwards the second through hole. The suction head 1 for vacuum cleaner and the rear extension tube 3 may be connected fixedly by inserting the rear extension tube 3 into the tube section 11 at the rear portion of the suction head 1 for vacuum cleaner, and bouncing the second fixing pin out of the joint hole 131 of the second join section. The same structure may be used for connection with the hose 4 for vacuum cleaner and connection with the vacuum cleaner body 5 via the hose 4.

[0032] With the vacuum cleaner having the above structure, a user may remove the floor suction head 2 from the suction head 1 for vacuum cleaner so as to clean a corner directly. After cleaning the corner, the user may simply connect the suction head 1 for vacuum cleaner with the floor suction head 2 again so as to clean the floor. Accordingly, the operational convenience may be improved considerably.

[0033] In an embodiment of the present invention, ribs 113 are formed on the peripheral surface of the tube section 11, and grooves 213 are formed on the inner surface of the connecting tube 21. However, ribs 113 and grooves 213 may not be formed as long as the joint strength of the first joint section 12 maybe ensured for easier manufacturing.

[0034] Further, in the above embodiment of the present invention, the external diameter of the front end portion of the tube section 11 is smaller than the external diameter of its rear end portion, and the external diameter of the front end portion of the tube section 11 is smaller than the external diameter of the extension tube 21 of the floor suction head 2. Accordingly, it may be ensured that the diameter dimension of the suction head 1 for vacuum cleaner as a whole and the extension tube 3 may not be excessively large or small.

[0035] In summary, the user does not necessarily replace the suction head in use for cleaning a corner of a room. A user may use the suction head for vacuum cleaner in the above embodiment as a small suction head for cleaning a corner. Further, the labor of replacing the suction head by the user every time after cleaning the corners may be avoided by connecting the front end portion of the tube section 11 directly with the floor suction head, and thus convenience in use may be improved considerably.

[0036] Furthermore, the present invention is not limited to the figures and the particular embodiments. A person skilled in this art can modify or vary the present invention as necessary without departing from essential spirit or scope of the present invention. All of those modifications and variations should be included in the scope of the present invention.

Claims

1. A suction head for vacuum cleaner, **characterized by** comprising:

   a tube section;
   a first joint section for connecting with a first connecting tube, which is disposed at the front end portion of said tube section;
   a second joint section for connecting with a second connecting tube, which is disposed at the rear end portion of said tube section;
   a suction section which extends from the exterior wall of said tube section toward the front end of said tube section so as to cover said first joint section;
   a suction inlet disposed at the front end of said suction section.

2. The suction head for vacuum cleaner according to claim 1, **characterized in that**:

   a hairbrush is formed by hair-planting at the edge of said suction inlet in a direction parallel with the axial line of said tube section.

3. The suction head for vacuum cleaner according to claim 2, **characterized in that:**

   said suction inlet is disposed to be inclined relative to the axial line of said tube section, and the end of said hairbrush is cut so as to be in parallel with the plane in the opening of said suction inlet.

4. The suction head for vacuum cleaner according to claim 3, **characterized in that:**

   the front end portion or part thereof of said tube section is cut parallel with the inclined surface of said suction inlet, such that said suction section is entirely covered in said suction section.

5. The suction head for vacuum cleaner according to claim 1, **characterized in that** said first joint section comprises:

a first through hole formed at the front end portion of said tube section,
a first fixing pin protruding a specified length from the interior side of said tube section through said first through hole, and
a first elastomer disposed at the interior side of said tube section and applying an elastic force to said first fixing pin in a direction outwards to said first through hole.

6. The suction head for vacuum cleaner according to any of claims 1-5, **characterized in that** a release space is formed in said suction section and above said first joint section.

7. The suction head for vacuum cleaner according to claim 5, **characterized in that:**

a first joint hole is formed at the end of said first connecting tube that is connected with said tube section at the front end portion of said tube section;
after being inserted into said tube section at the side of said suction section, said first fixing pin protrudes from said first joint hole so as to fasten said first connecting tube and said tube section.

8. The suction head for vacuum cleaner according to claim 1, **characterized in that:**

said second joint section is formed as a second joint hole disposed at the rear end portion of said tube section.

9. The suction head for vacuum cleaner according to claim 8, **characterized in that:**

the front end of said second connecting tube that is connected with said tube section at the rear end portion of said tube section comprises:
a second through hole formed at the front end portion of said second connecting tube,
a second fixing pin protruding a specified length from the interior side of said second connecting tube through said second through hole, and
a second elastomer disposed at the interior side of said second connecting tube and applying an elastic force to said second fixing pin in a direction outwards to said second through hole.

10. The suction head for vacuum cleaner according to claim 1, **characterized in that:**

said first joint section further comprises:

ribs in parallel with the axial line of said tube section and protruding outwards, which are formed on the peripheral surface of said tube section being covered by said suction section, and
grooves interlocked with plurality of said ribs, which are disposed on the inner surface of the rear end portion of said first connecting tube.

11. The suction head for vacuum cleaner according to claim 10, **characterized in that:**

plurality of said ribs are arranged in bilateral symmetry relative to the axial line of said tube section, and
said suction head are formed with grooves arranged to correspond with plurality of said ribs.

12. The suction head for vacuum cleaner according to claim 10 or 11, **characterized in that:**

the external diameter of the front end portion of said tube section is smaller than the external diameter of its rear end portion,
the external diameter of the front end portion of said tube section is smaller than the external diameter of said first connecting tube, and said ribs and said grooves fit tightly.

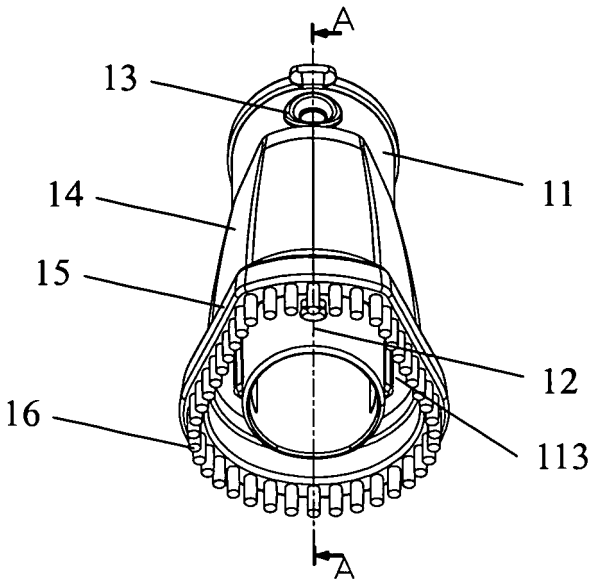

Fig. 1

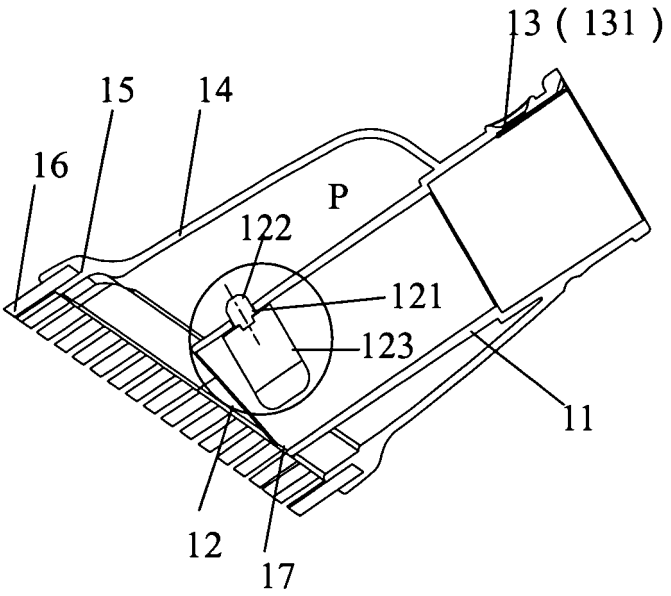

Fig. 2

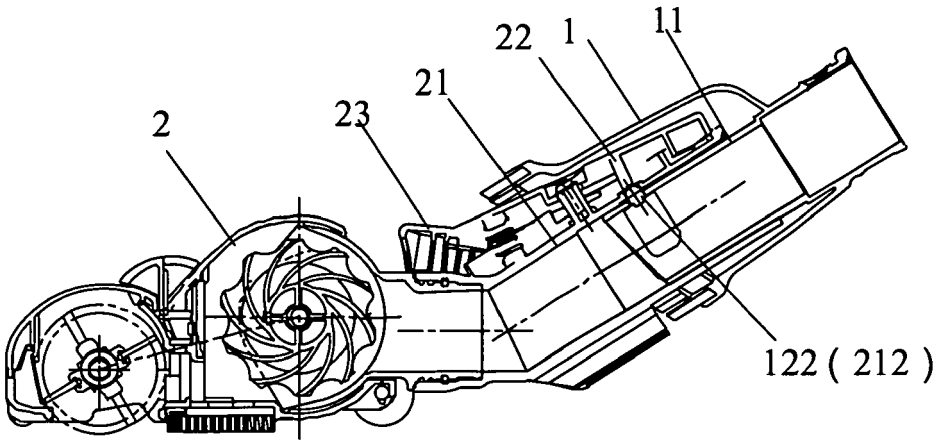

Fig. 3

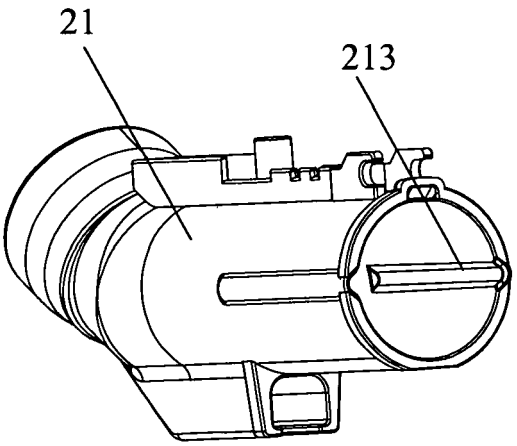

Fig. 4

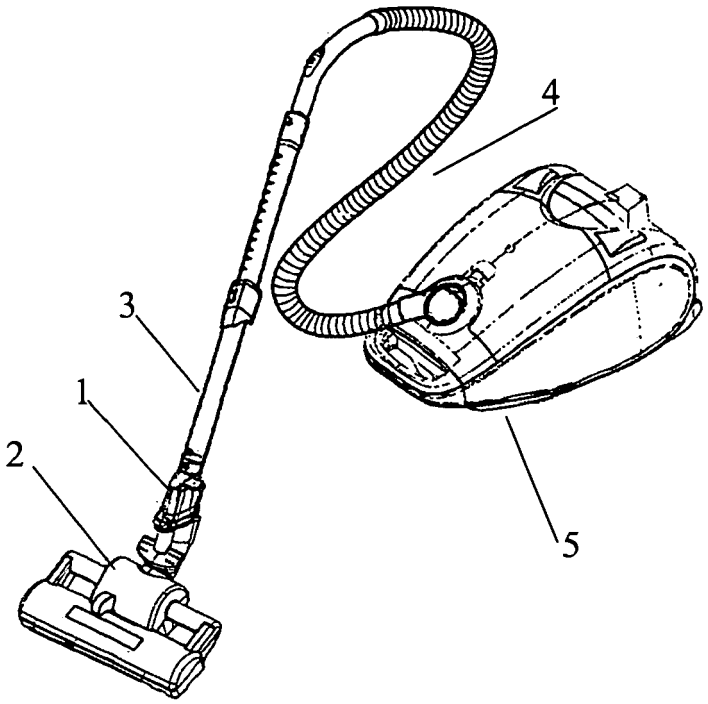

Fig. 5