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(54) **Joint construction of suction head for vacuum cleaner and vacuum cleaner having the construction**

Gelenkkonstruktion eines Saugkopfs für einen Staubsauger und Staubsauger damit

Construction groupée de hauteur d'aspiration pour aspirateur et aspirateur disposant de la construction

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Description

Technical Field

[0001] The present invention relates to a joint construction of a suction head for a vacuum cleaner and a vacuum cleaner having said construction.

Background

[0002] Document US 4 700 429 A discloses a vacuum cleaner having a quick release mechanism arranged on a swivel connector portion of the suction head. An extension tube comprises at its lower end a protruding portion which may cooperate with a corresponding opening to obtain a locking and fixing of the extension tube when inserted into the connector portion. At one side of the connector portion a release lever in the form of a foot pedal portion is arranged which can be operated by the user with one of his feet, and when the foot pedal is depressed, the engagement of the extension tube in the connector portion can be released. The user can extract the extension tube from the connector portion.

[0003] In a traditional vacuum cleaner, when connecting a floor suction head, an extension tube is usually directly inserted into the connecting tube of the floor suction head, and they are fixed to each other by adaptation between their outside diameter and inside diameter. Although the extension tube can connect with the floor suction head, it may lead to looseness of the connection due to movement of the extension tube held by a user. Thus, it is proposed to provide a fixing pin and a through hole, respectively, in the extension tube and the connecting tube, in which the extension tube is inserted into the connecting tube and the fixing pin ejects from the through hole to realize the fixation. However, it is not convenient for disassembly because the user has to bow or lift the floor suction head to release the adaptation between the fixing pin and the through hole.

Summary of the Invention

[0004] The present invention is made in view of the above considerations and to solve the above problems. The present invention provides a joint construction of a suction head for a vacuum cleaner and a vacuum cleaner having said construction as set out in the appended claims.

[0005] In more detail, the joint construction of the suction head for the vacuum cleaner in this invention comprises: a suction head body, a connecting tube and an extension tube; said connecting tube connects in between the suction head body and the extension tube, and said connecting tube is provided with a first joint section at the joint of said connecting tube and said extension tube, for connecting and fixing said extension tube; said extension tube is provided with a second joint section at the joint of said extension tube and said connecting tube,

for interlocking with said first joint section to connect and fix said extension tube and said connecting tube; a joint release section for releasing the interlocking between said first and second joint sections is provided above said connecting tube and covers said first joint section, said joint release section is arranged substantially along with the longitudinal direction of said connecting tube, with one end thereof provided with a supporting section which is shaft supported at the external surface of said connecting tube, and the other end thereof provided with an operating section for operating the motion of said joint release section, and said operating section is arranged above said floor suction head arm, and when said operating section is operated downwards to release the interlocking of said first and second joint sections, said operating section is supported by said floor suction head arm.

[0006] With above construction, the user can disconnect the extension tube and the connecting tube by operating the joint releasing section, which provides convenient operation, and the construction of the suction head can avoid damage of the first and second joint sections due to overexertion. The joint construction enables a user to release the connection between the fixing pin and the through hole by foot operation, which considerably improves operational convenience.

[0007] In addition, preferably, in the joint construction of a suction head for a vacuum cleaner of the present invention, said first joint section is a through hole provided on the upper tube wall of said connecting tube; said second joint section is a joint pin elastically protruding from the surface of said extension tube and interlocked with said through hole; said joint release section has a knock pin protruding towards said through hole of said first joint section and pressing said second joint section inward along the radial direction of said connecting tube. With said construction, the connection can be stabilized without detachment.

[0008] Further preferably, the joint release section has an elastic device which can apply an elastic force between the tube wall of said connecting tube and said joint release section for disconnecting said joint release section from said first joint section. The joint is not liable to be released when the operating section makes unintentional impact with other objects, which can prevent misoperation.

[0009] Further, it is preferably that the width of said operating section on the horizontal direction is wider than the diameter of said connecting tube. By increasing the area of the operating section, the operating section forms a large footplate which enables foot operation from any direction, and thus operation convenience is improved.

[0010] Further preferably, when said operating section is operated downwards and is supported by said suction head body, contacting portions between the underside of said operating section and the upper surface of said suction head body are arc-shape corresponding with each other. This can further avoid damage of the first and

second joint sections due to overexertion and stabilize the releasing operation.

[0011] Moreover, said operating section is preferably bilaterally symmetrical along the direction of said connecting tube. Thus, the user can operate the operating section from any direction without feeling any difference in the motion when performing the releasing operation from different directions.

[0012] Further, the present invention also provides a vacuum cleaner which has above joint construction of suction head for vacuum cleaner.

Description of Drawings

[0013]

Fig. 1 shows an embodiment of the construction of a floor suction head for a vacuum cleaner in accordance with the present invention.

Fig. 2 is a schematic diagram showing the joint status of the construction of the floor suction head shown in Fig. 1.

Fig. 3 is a top view showing the assembly of the floor suction head for the vacuum cleaner and the extension tube in accordance with the present invention.

Fig. 4 is a schematic diagram showing the disassembly process of the floor suction head for the vacuum cleaner and the extension tube in accordance with the present invention.

Fig. 5 is an integer perspective view of the vacuum cleaner in accordance with the present invention.

Mode of Carrying Out the Invention

[0014] Hereinafter, the embodiment of the present invention will be described in details in reference to the drawings.

[0015] Fig. 1 shows an embodiment of the construction of a floor suction head for a vacuum cleaner in accordance with the present invention. In the present embodiment, the joint construction of the suction head for the vacuum cleaner comprises a floor suction head for collecting dusts on the floor, a connecting tube 10 connected to the rear side of the floor suction head, and an extension tube 8 connected to the rear side of the connecting tube 10. The floor suction head comprises a suction head body 1 provided at the foreside thereof and a floor suction arm 2 movably connected with the suction head body 1, and the floor suction head is connected with the connecting tube 10 by the floor suction head arm 2. The extension tube 8 is connected to the rear side of the connecting tube 10, which is held by a user and moves the floor suction head on the floor surface for cleaning.

[0016] As shown in Fig. 1, the connecting tube 10 is provided with a through hole 11 (a first joint section) at the joint portion of the connecting tube 10 and the extension tube 8, and the extension tube 8 is provided with a joint pin 9 at the joint of the extension tube 8 and the

connecting tube; the joint pin 9 is pressed outwards by an elastic force of a spring, a spring leaf or the like on the inner wall of the connecting tube 10. When the extension tube 8 is inserted into the connecting tube 10, the joint pin 9 is pressed by the tube wall of the connecting tube 10, and thus the extension tube 8 is inserted. When the joint pin 9 reaches the through hole 11, it will bounce due to the elastic force; thus, the connecting tube 10 and the extension tube 8 are connected and fixed with each other by the interlocking of the joint pin 9 and the through hole 11.

[0017] In addition, in the present embodiment, there is a joint release section 12 above the through hole 11 (and the joint pin 9 interlocked with it); the joint pin 9 can be press downwards by the use of the release section 12 such that the extension tube 8 can be pulled out from the connecting tube 10, thereby releasing the connection and the fix of the extension tube 8 and the connecting tube 10. Fig. 2 shows a sectional view of the joint state. As long as the respective positions of the through hole 11 and the joint pin 9 in the connecting tube 10 and the extension tube 8 are properly arranged, an inserting length of the extension tube 8 into the connecting tube 10 can be determined. Further, the inner diameter of the connecting tube 10 and the outer diameter of the extension tube 8 can be properly set, such that the connecting tube 10 and the extension tube 8 can be firmly fixed by the interlocking of the joint pin 9 and the through hole 11.

[0018] The suction head for the vacuum cleaner needs to be cleaned and stored after use, and thus the connecting tube 10 and the extension tube 8 need to be disconnected. Therefore, in order to improve the convenience of the disassembly operation, the vacuum cleaner of the present embodiment also comprises a joint release section 12. Hereinafter, the construction of the joint release section 12 is described in detail.

[0019] In the present embodiment, the joint release section 12 is arranged substantially along with the longitudinal direction of the connecting tube 10 and covers the through hole 11 (and the joint pin 9 connected with it). In addition, a supporting section 13 is provided at one end of the longitudinal direction of the connecting tube 10, which is shaft supported at the external surface of the connecting tube 10, and an operating section 5 is provided at the other end; a knock pin 12a, which protrudes towards the direction of the through hole 11, is provided on the position corresponding to the through hole 11. In accordance with the above embodiment, as shown in Fig. 2, the operating section 5 is pressed downwards along the direction of arrow A, such that the joint release section 12 rotates around the supporting section 13 provided at the end thereof, thereby the knock pin 12a is inserted into the through hole 11 towards the direction of the through hole 11, which presses the joint pin 9 downwards and releases the interlocking of the through hole 11 and the joint pin 9, and thus the extension tube 8 is pulled out from the connecting tube 10.

[0020] Further, the joint release section 12 is provided

with a spring 6 (an elastic device) for operational convenience. In the present embodiment, the spring 6 is arranged between the release section and the connection tube 10, and which applies an elastic force between the joint release section 12 and the connecting tube 10 to disconnect them. Under the elastic force of the spring 6, the joint release section 12 lifts the knock pin 12a and the operating section 5 with the supporting section 13 being a pivot. In this status, the knock pin 12a leaves the through hole 11 without applying any force to the joint pin 9. The structure for limiting the lifting height of the operating section 5 of the joint release section 12 can be of any construction. For example, in the present embodiment, the release section 12 is provided with a hole, and a nut 7 which is fixed by penetrating the hole and screwing vertically into the side wall of the connecting tube 10; the lifting height of the joint release section 12 can be limited by the tail flange of the nut 7 and the edge of the hole. Nevertheless, opposite hooks can be provided on the joint release section 12 and the connecting tube 10, respectively; when the joint release section 12 is lifted by the spring 6, the lifting height can be limited by the hitch of the terminal ends of said two hooks.

[0021] In the present embodiment, Fig. 3 is a top view of the suction head for the vacuum cleaner of the present embodiment. In order to conveniently disassemble the extension tube 8 and the connecting tube 10, the operating section 5 is a footplate (hereinafter refer to as the footplate 5) arranged in the horizontal direction with increased width on both sides. As the width of the footplate 5 exceeds the diameter of the connecting tube 10, the user can step downwards on the footplate 5 with his foot after cleaning of floor, such that the knock pin of the joint release section 12 presses against the joint pin 9 to release the connection and the fix between the extension tube 8 and the connecting tube 10. As shown in Fig. 4, the extension tube 8 is pulled out along the direction of arrow B.

[0022] Further, in the present embodiment, as shown in Figs. 1 and 2, the footplate 5 extends above the floor suction head, i.e., reaches the upside of the floor suction head arm 2. Since the connecting tube 10 and the floor suction head arm are connected and fixed with each other, the angle between the footplate 5 and the floor suction head arm 2 is very small, and thereby the angle of the footplate 5 in the horizontal direction can be reduced, which may facilitate the downward operation of the footplate 5.

[0023] In addition, when a user steps on the footplate 5 and the knock pin 12a releases the interlocking of the through hole 11 and the joint pin 9, the underside of the footplate 5 is supported by the upper surface of the floor suction head (the floor suction head arm 2 in the present embodiment). It can stabilize the operation of the user and avoid damage of the joint pin 9 caused by over-insertion of the knock pin 12a into the through hole.

[0024] Further, when a user steps on the footplate 5 and the knock pin 12a releases the interlocking of the

through hole 11 and the joint pin 9, the underside of the footplate 5 and the upper surface of the floor suction head (the floor suction head arm 2 in the present embodiment) form arc-shapes which adapt with each other. Thus, the stress supporting range between the footplate 5 and the floor suction head are increased during the disassembly operation, which can stabilize the operation of the user and avoid damage of the joint release section 12 caused by concentrated stress.

[0025] In addition, the present invention also provides a vacuum cleaner using the joint construction of the suction head for the vacuum cleaner of the above invention. As shown in Fig. 5, the vacuum cleaner comprises a floor suction head, the above mentioned joint construction, a hose 20 connected with the extension tube, and a cleaner body 30 connected to the end of the hose 20 for driving the vacuum cleaner. In accordance with above vacuum cleaner of the present invention, a user can disassemble the extension tube and the connecting tube of the floor suction head by simple operation, and thus enhance convenience.

Claims

1. A joint construction of a suction head for a vacuum cleaner, comprising:

- a suction head body (1), a connecting tube (10) and an extension tube (8);
- said connecting tube (10) connects in between the suction head body and the extension tube,
- said connecting tube (10) is provided with a first joint section (11) at the joint of said connecting tube and said extension tube, for connecting and fixing said extension tube;
- said extension tube (8) is provided with a second joint section (9) at the joint of said extension tube and said connecting tube, for interlocking with said first joint section to connect and fix said extension tube and said connecting tube;
- a joint release section (12) for releasing the interlocking between said first and second joint sections is provided above said connecting tube and covers said first joint section; and
- said joint release section (12) is arranged substantially along with the longitudinal direction of said connecting tube, with one end thereof provided with a supporting section which is shaft supported at the external surface of said connecting tube, and the other end thereof provided with an operating section (5) for operating the motion of said joint release section;

characterized in that

- said operating section (5) is arranged above said floor suction head arm (2), and when said

operating section is operated downwards to release the interlocking of said first and second joint sections, said operating section is supported by said floor suction head arm.

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

said first joint section (11) is configured as a through hole provided on the upper tube wall of said connecting tube;
said second joint section (9) is configured as a joint pin elastically protruding from the surface of said extension tube (8) and interlocked with said through hole;
said joint release section (12) has a knock pin protruding towards said through hole of said first joint section and pressing said second joint section inward along the radial direction of said connecting tube (10).

3. The joint construction of the suction head for the vacuum cleaner according to claim 1, **characterized in that:**

said joint release section (12) has an elastic device (6) which can apply an elastic force between the tube wall of said connecting tube and said joint release section for disconnecting said joint release section from said first joint section (11).

4. The joint construction of the suction head for the vacuum cleaner according to claim 1, **characterized in that:**

the width of said operating section (5) on the horizontal direction is wider than the diameter of said connecting tube (10).

5. The joint construction of the suction head for the vacuum cleaner according to claim 1, **characterized in that:**

when said operating section (5) is operated downwards and is supported by said suction head body (1), contacting portions between the underside of said operating section and the upper surface of said suction head body are arc-shape corresponding with each other.

6. The joint construction of the suction head for the vacuum cleaner according to any one of claims 1 to 4, **characterized in that:**

said operating section (5) is preferably bilaterally symmetrical along the direction of said connect-

ing tube (10).

7. A vacuum cleaner, **characterized by:**

- 5 having the joint construction of the suction head for the vacuum cleaner according to any one of claim 1 to 6.

10 Patentansprüche

1. Gelenkkonstruktion eines Saugkopfs für einen Staubsauger, umfassend:

- 15 - einen Saugkopfkörper (1), ein Verbindungsrohr (10) und ein Verlängerungsrohr (8);
- wobei das Verbindungsrohr (10) zwischen dem Saugkopfkörper und dem Verlängerungsrohr verbindet,
20 - wobei das Verbindungsrohr (10) einen ersten Gelenkabschnitt (11) umfasst an dem Gelenk des Verbindungsrohrs und des Verlängerungsrohrs, zum Verbinden und Fixieren des Verlängerungsrohrs;
25 - wobei das Verlängerungsrohr (8) einen zweiten Gelenkabschnitt (9) umfasst an dem Gelenk des Verlängerungsrohrs und des Verbindungsrohrs, zum Ineinandergreifen mit dem ersten Gelenkabschnitt zum Verbinden und Fixieren des Verlängerungsrohrs und des Verbindungsrohrs;
30 - wobei ein Gelenkfreigabeabschnitt (12) zum Freigeben des Ineinandergreifens zwischen den ersten und zweiten Gelenkabschnitten bereitgestellt ist oberhalb des Verbindungsrohrs, und wobei der Gelenkfreigabeabschnitt (12) den ersten Gelenkabschnitt bedeckt; und
35 - wobei der Gelenkfreigabeabschnitt (12) im Wesentlichen entlang der longitudinalen Richtung des Verbindungsrohrs angeordnet ist, wobei ein Ende davon mit einem Lagerabschnitt versehen ist, der an der Außenfläche des Verbindungsrohrs wellengelagert ist, und wobei ein anderes Ende davon mit einem Bedienungsabschnitt (5) zum Bedienen der Bewegung des Gelenkfreigabeabschnitts versehen ist;

dadurch gekennzeichnet, dass

- 45 - der Bedienungsabschnitt (5) oberhalb des Bodensaugkopfs (2) angeordnet ist, und, wenn der Bedienungsabschnitt abwärts betätigt wird, das Ineinandergreifen der ersten und zweiten Gelenkabschnitte freigibt, wobei der Bedienungsabschnitt durch den Bodensaugkopf gestützt wird.

2. Gelenkkonstruktion eines Saugkopfs für einen

Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass**

der erste Gelenkabschnitt (11) ausgestaltet ist als Durchgangsbohrung, die auf der oberen Rohrwand des Verbindungsrohrs bereitgestellt ist;
und dass der zweite Gelenkabschnitt (9) ausgestaltet ist als Gelenkbolzen, der elastisch aus der Oberfläche des Verlängerungsrohrs (8) herausragt und der mit der Durchgangsbohrung ineinandergreift;
wobei der Gelenkfreigabeabschnitt (12) einen Schlagbolzen aufweist, der zu der Durchgangsbohrung des ersten Gelenkabschnitts ragt und der den zweiten Gelenkabschnitt nach Innen entlang der Radialrichtung des Verbindungsrohrs (10) drückt.

3. Gelenkkonstruktion eines Saugkopfs für einen Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass**

der Gelenkfreigabeabschnitt (12) eine elastische Vorrichtung (6) aufweist, die eine elastische Kraft zwischen der Rohrwand des Verbindungsrohrs und dem Gelenkfreigabeabschnitt aufbringt zum Lösen des Gelenkfreigabeabschnitts von dem ersten Gelenkabschnitt (11).

4. Gelenkkonstruktion eines Saugkopfs für einen Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass**

die Breite des Bedienungsabschnitts (5) in horizontaler Richtung breiter ist als der Durchmesser des Verbindungsrohrs (10).

5. Gelenkkonstruktion eines Saugkopfs für einen Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass**

wenn der Bedienungsabschnitt (5) abwärts betätigt wird und durch den Saugkopfkörper (1) gestützt wird, Verbindungsabschnitte zwischen der Unterseite des Bedienungsabschnitts und der oberen Fläche des Saugkopfkörpers sich bogenförmig entsprechen.

6. Gelenkkonstruktion eines Saugkopfs für einen Staubsauger nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass**

der Bedienungsabschnitt (5) vorzugsweise bilateral symmetrisch entlang der Richtung des Verbindungsrohrs (10) ist.

7. Staubsauger, **gekennzeichnet durch** eine Gelenkkonstruktion eines Saugkopfs für den Staubsauger nach einem der Ansprüche 1 bis 6.

Revendications

1. Structure de raccordement d'une tête d'aspiration pour un aspirateur, comprenant :

un corps de tête d'aspiration (1), un tube de liaison (10) et un tube d'extension (8) ;

ledit tube de liaison (10) relie le corps de tête d'aspiration et le tube d'extension,

ledit tube de liaison (10) est pourvu d'une première section de raccordement (11) au niveau de la jonction dudit tube de liaison et dudit tube d'extension, afin de relier et fixer ledit tube d'extension ;

ledit tube d'extension (8) est pourvu d'une deuxième section de raccordement (9) au niveau de la jonction dudit tube d'extension et dudit tube de liaison, pour se verrouiller avec ladite première section de raccordement afin de relier et fixer ledit tube d'extension et ledit tube de liaison ;

une section de libération de raccordement (12) pour libérer le verrouillage entre lesdites première et deuxième sections de raccordement est prévue au-dessus dudit tube de liaison et couvre ladite première section de raccordement ; et

ladite section de libération de raccordement (12) est agencée sensiblement le long de la direction longitudinale dudit tube de liaison, avec une extrémité de celle-ci est pourvue d'une section de support qui est supportée sur un arbre au niveau de la surface externe dudit tube de liaison, et l'autre extrémité de celle-ci est pourvue d'une section d'actionnement (5) pour actionner le mouvement de ladite section de libération de raccordement ;

caractérisée en ce que

ladite section d'actionnement (5) est agencée au-dessus dudit bras de tête d'aspiration de sol (2), et lorsque ladite section d'actionnement est actionnée vers le bas pour libérer le verrouillage desdites première et deuxième sections de raccordement, ladite section d'actionnement est supportée par ledit bras de tête d'aspiration de sol.

2. Structure de raccordement de la tête d'aspiration pour l'aspirateur selon la revendication 1, **caractérisée en ce que :**

ladite première section de raccordement (11) est configurée sous la forme d'un trou traversant prévu sur la paroi de tube supérieure dudit tube de liaison ;

ladite deuxième section de raccordement (9) est configurée sous la forme d'une broche de raccordement faisant saillie élastiquement à partir de la surface dudit tube d'extension (8) et verrouillée avec ledit trou traversant ;

ladite section de libération de raccordement (12) présente une goupille faisant saillie vers ledit trou traversant de ladite première section de raccordement et exerçant une pression sur ladite

deuxième section de raccordement vers l'intérieur le long de la direction radiale dudit tube de liaison (10).

3. Structure de raccordement de la tête d'aspiration pour l'aspirateur selon la revendication 1, **caractérisée en ce que** :

ladite section de libération de raccordement (12) présente un dispositif élastique (6) qui peut appliquer une force élastique entre la paroi de tube dudit tube de liaison et ladite section de libération de raccordement pour séparer ladite section de libération de raccordement de ladite première section de raccordement (11).

4. Structure de raccordement de la tête d'aspiration pour l'aspirateur selon la revendication 1, **caractérisée en ce que**:

la largeur de ladite section d'actionnement (5) dans la direction horizontale est plus importante que le diamètre dudit tube de liaison (10).

5. Structure de raccordement de la tête d'aspiration pour l'aspirateur selon la revendication 1, **caractérisée en ce que** :

lorsque ladite section d'actionnement (5) est actionnée vers le bas et est supportée par ledit corps de tête d'aspiration (1), des parties de contact entre la face inférieure de ladite section d'actionnement et la surface supérieure dudit corps de tête d'aspiration sont en forme d'arc correspondant les unes aux autres.

6. Structure de raccordement de la tête d'aspiration pour l'aspirateur selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** :

ladite section d'actionnement (5) est de préférence en symétrie bilatérale le long de la direction dudit tube de liaison (10).

7. Aspirateur, **caractérisé par** :

le fait d'avoir la structure de raccordement de la tête d'aspiration pour l'aspirateur selon l'une quelconque des revendications 1 à 6.

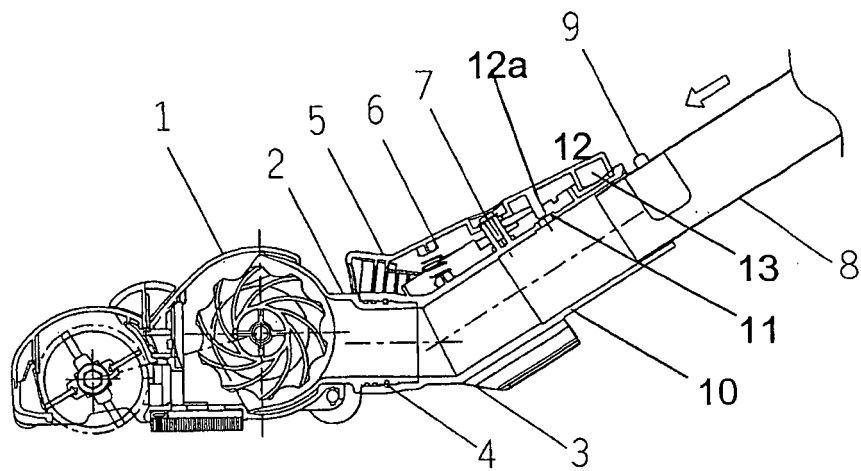


Fig. 1

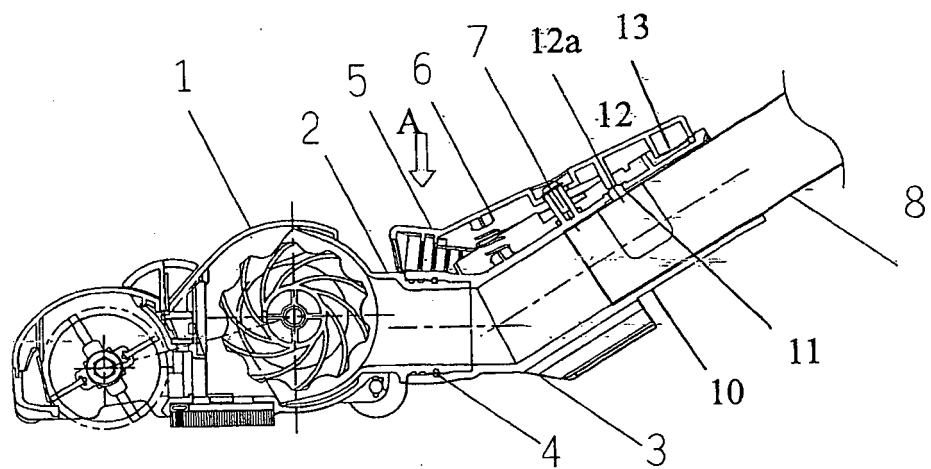


Fig. 2

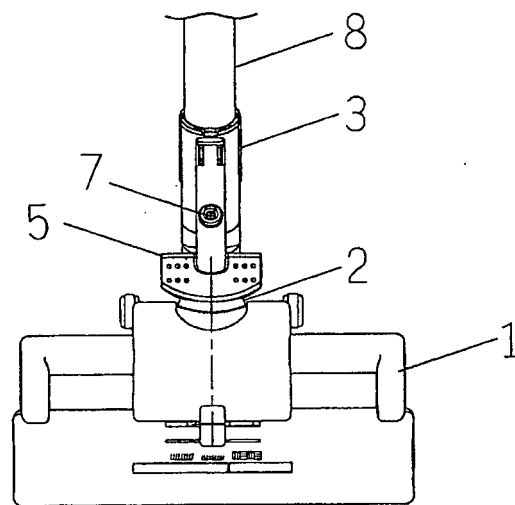


Fig. 3

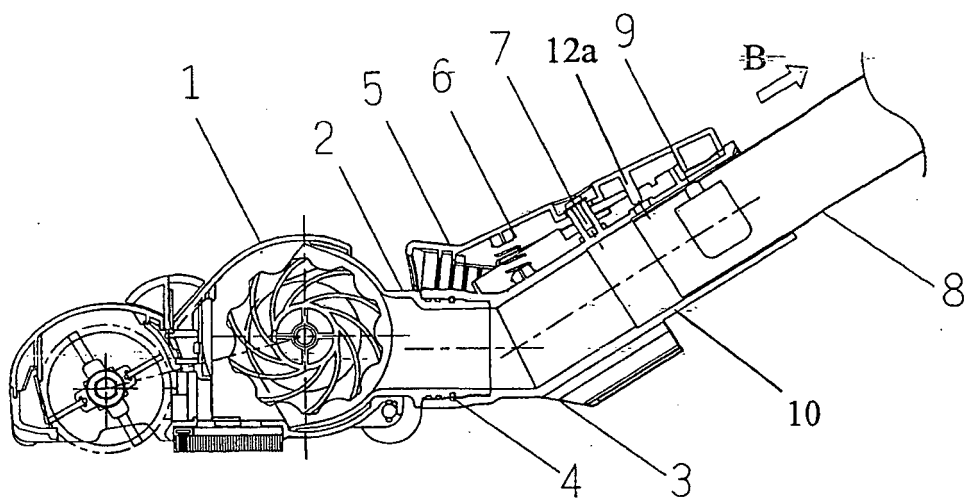


Fig. 4

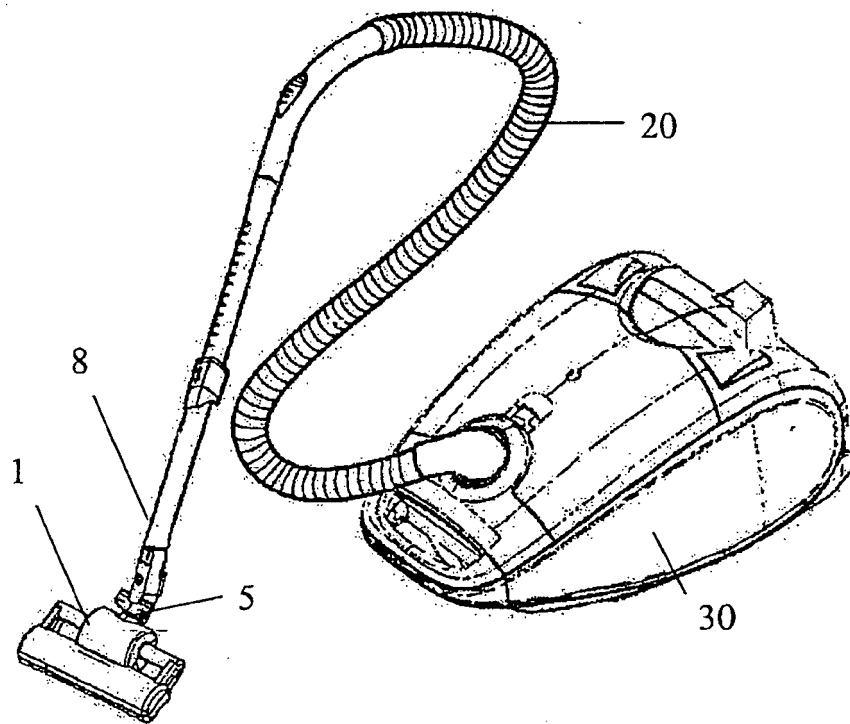


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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