EUROPEAN PATENT SPECIFICATION

Date of publication and mention of the grant of the patent: 10.08.2011 Bulletin 2011/32

Application number: 04721038.0
Date of filing: 16.03.2004

Int Cl.: A47L 9/06 (2006.01)

International application number: PCT/KR2004/000562

SUCTION NOZZLE AND HEAD OF VACUUM CLEANER HAVING THE SAME
SAUGDÜSE UND STAUBSAUGERKOPF MIT SELBIGER
BUSE D’ASPIRATION ET TETE D’ASPIRATEUR A VIDE COMPRENANT LADITE BUSE

Designated Contracting States:
AT BE BG CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

Date of publication of application: 29.11.2006 Bulletin 2006/48

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Description

Technical Field

[0001] The present invention relates to a cleaner, and particularly, to a suction nozzle and a cleaner head having the same capable of effectively sucking alien substances such as dust from a non-carpeted floor and also effectively sucking alien substances such as dust or crumbs from roots of carpet fibers in cleaning a carpet.

Background Art

[0002] A vacuum cleaner is mainly used for a convenient cleaning at home or office, and there are various kinds of vacuum cleaner.

[0003] In general, a vacuum cleaner includes a cleaner main body generating a suction force and filtering alien substances such as dust, crumbs, sand or the like; a cleaner head through which alien substances are sucked together with air by a suction force generated at the cleaner main body; and a connection hose connecting the cleaner main body and the cleaner head.

[0004] In such a cleaner, when a suction force is generated in the cleaner main body, alien substances on a floor are sucked together with air through the cleaner head by the suction force and are introduced to the cleaner main body. The alien substances introduced into the cleaner main body together with air are filtered by a filter provided in the cleaner main body, to be collected, and the air is discharged outside.

[0005] According to a kind of vacuum cleaner, a collecting filter for collecting alien substances may be installed in the cleaner main body or separately installed at outside.

[0006] In such a vacuum cleaner, efficiency of sucking alien substances such as dust, crumbs, sand or the like on a floor together with air and noise generation are affected by a shape of a cleaner head. If a suction path formed between the cleaner head and a floor is big, a suction force for sucking alien substances such as dust is weakened compared to a suction force generated in the cleaner main body, whereby alien substances are not effectively introduced thereinto. And, if the suction path between the cleaner head and a floor is small, a suction force becomes excessively strong whereby the cleaner head cannot move smoothly and noise is greatly generated.

[0007] In addition, a form of the cleaner head used when removing alien substance such as dust, crumbs, sand or the like in a carpet and a form of the cleaner head used when removing alien substances on a non-carpeted floor are difference from each other. Also, there is a cleaner head having one form that can be used in cleaning both carpet and non-carpeted floor.

[0008] Figures 1, 2 are perspective views showing one embodiment of a conventional cleaner head which is disclosed in US Patent No.: 6,421,875. In the cleaner head, an air channel 12 having a certain width is formed at a bottom edge 11, which comes in contact with a floor, in a longitudinal direction, and a suction hole 13 through which air is sucked is positioned in the middle of the air channel 12. On the basis of the suction hole 12, the air channel on the left side becomes a left air channel, and that on the right becomes a right air channel. A plurality of air channels 16 is respectively formed at certain intervals therebetween, within a front bottom edge 14 positioned in front of the air channel 12 and within a rear bottom edge 15 positioned in the rear of the air channel 12. Also, a brush 17 may be mounted to the rear bottom edge 15.

[0009] When a user cleans a floor, such a cleaner head moves along the floor with the bottom edge 11 contacted with the floor in a state that a suction force is applied to the suction hole 13. External air is sucked into a suction path formed by the air channels 12, 16 formed within the bottom edge 11 and the floor. At this time, the air is sucked to the air channels 16 formed within the front and rear bottom edges 14, 15, generating a vortex. The air is sucked into the section path, together with alien substances or the like.

[0010] However, such a cleaner head is not proper for cleaning a carpet since the cleaner head sucks alien substances only with a suction force of air whereby alien substances such as dust, crumbs, sand or the like positioned between carpet fibers are not removed in cleaning the carpet.

[0011] Figure 3 is a bottom view showing another embodiment of a conventional cleaner head which is disclosed in EP 0,552,652. In the cleaner head, a suction hole 21 having predetermined width and length is formed in a bottom of the head which comes in contact with a floor, and a front suction channel 21 and a rear suction channel 23 having certain width and length are formed in its bottom. The front suction channel 22 and the rear suction channel 23 are formed in a rectangular shape, and side passages 25, 26 are respectively formed at both walls of the two channels 22, 23.

[0012] The suction holes 21 are formed in the middle of the suction channel 22 and of the rear suction channel 23. A brush strip 26 is positioned between the first section channel 22 and the rear suction channel 23. An end of the brush strip 26 is formed in a concavo-convex form, and its height is almost the same as a height of the bottom part of the head.

[0013] When a user cleans a floor or a carpet, such a cleaner head moves along a floor with a bottom of the head contacted with the floor in a state that a suction force is applied to the suction hole 21. External air is introduced thereinto through suction paths respectively formed by the front suction channel 22 of the cleaner head and a floor and by the rear suction channel 23 and the floor, and herein, the air is introduced, together with alien substances. At this time, the external air is introduced into the suction path through the side passages 24, 25, and the brush strip 26 scrapes carpet fibers.
However, in such a cleaner head, pressure is leaked between the front suction channel 22 and the rear station channel 23 because of a brush strip 26 positioned between the front suction channel 22 and the rear section channel 23 and having a concavo-convex form, thereby deteriorating intensity of flow. In addition, the brush cannot sufficiently scrape carpet fibers to their root portions since the height of the brush strip 26 is the same as that of the bottom of the head, and air is sucked from the side, thereby cleaning cannot be sufficiently performed.

Figure 4, 5 are views showing still another embodiment of a conventional cleaner head, which is disclosed in EP 0,885,586. In the cleaner head, a suction channel is formed in a bottom edge 31 which comes in contact with a floor, and a section hole 32 is positioned in the middle of the suction channel. A scraper blade 33 made of an elastic material and having certain width and area is mounted in front of the bottom edge 31, and a brush bar 34 is mounted in the rear of the scraper blade 33. When viewed based on the floor, an end of the scraper blade 33 is higher than the bottom edge, and an end of the brush bar 34 is higher than that of the scraper blade 33. A plurality of holes 35 is formed within the scraper blade 33 at certain intervals therewith, and notches 36 corresponding to positions of the holes 35 are formed within the end portion of the brush bar 34.

When a user cleans a carpet or a non-carpeted floor, such a cleaner head moves along the floor with the bottom edge 31 contacted with the floor in a state that a suction force is applied to the suction hole 32. External air is sucked thereinto through a suction path formed by the suction channel and the floor, and herein, the air is sucked, together with alien substances. At this time, external air is sucked thereinto through both sides and a rear side of the bottom edge 31.

The scraper blade 33 and the brush bar 34 positioned in front of the bottom edge 31 push back carpet fibers.

However, in such a cleaner head, the scraper blade 33 and the brush bar 34 push back carpet fibers from outside the suction path, that is, in front of the bottom edge 31 and external air is sucked through a suction path formed at both sides and a rear of the bottom edge 31, whereby alien substances cannot be effectively sucked from the roots of carpet fibers.

By the above mentioned conventional arts, when cleaning a non-carpeted floor, alien substances are sucked in a certain amount by a suction force applied to a suction path formed by an air channel and a floor, whereas when cleaning a carpet, alien substances cannot effectively sucked from roots of carpet fibers. Especially, if the carpet fiber is long, alien substances such as dust, crumbs, sand or the like are not sufficiently sucked from a root of the carpet fiber.

In addition, in the cleaner heads, a suction path through which alien substances are sucked is formed at both sides of the head when viewed in a direction that a cleaning proceeds, whereby alien substances are not effectively sucked.

EP 1 092 380 discloses a vacuum cleaner head suction system including a shoe plate that forms a suction channel, two wheels disposed towards the back of the head beneath the suction pipe and two parallel brushes to the front of the head. A third brush is situated between the wheels at the entrance of the suction pipe. The brush housing can pivot the brush between active or inactive positions, when inactive the sucker contacts the floor being supported by the front brushes and the wheels, when active the front and back brushes support the suction pipe.

US 5 539 953 discloses a floor nozzle for vacuum cleaners comprising a housing and two suction channels, separated by an intermediate strip, arranged in the bottom plate thereof and extending transversely to the direction of movement the intermediate strip being designed as a rigid plow strip arranged between a front and a rear cleaning edge and acting to open the nap to be cleaned, due to its digging-in effect, toward the front or rear suction channel, depending on the direction of movement.

DISCLOSURE OF THE INVENTION

Therefore, it is an object of the present invention to provide a cleaner head capable of effectively sucking alien substances from a non-carpeted floor and also, in cleaning a carpet, effectively sucking alien substances from a root of a carpet fiber.

It is another object of the present invention to provide a suction nozzle and a cleaner head having the same capable of improving suction performance of alien substances by forming a suction path through which air is sucked in a direction that a cleaning proceeds.

To achieve the above object, there is provided a suction nozzle as defined in claim 1 and a head of a vacuum cleaner as defined in claim 16.

Description of Drawings

Figures 1, 2 are perspective views showing one embodiment of a head of a conventional vacuum cleaner;

Figure 3 is a bottom view showing another embodiment of a head of a conventional vacuum cleaner;

Figure 4 is a side view showing still another embodiment of a head of a conventional vacuum cleaner;

Figure 5 is a partial front view of the vacuum cleaner;

Figure 6 is a bottom view showing one embodiment of a suction nozzle in accordance with the present invention;

Figure 7 is a front view of a scraper constructing a suction nozzle in accordance with the present invention;

Figures 8, 9 are bottom views showing other embodiments of a section nozzle in accordance with the present invention respectively;
Figure 10 is a bottom view showing one embodiment of a head of a vacuum cleaner with a suction nozzle in accordance with the present invention;

Figures 11, 12 are side views respectively showing operational states of a suction nozzle in accordance with the present invention; and

Figures 13, 14 are side views showing operational states of a vacuum cleaner head with a suction nozzle in accordance with the present invention.

Mode for Invention

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

As shown therein, a suction nozzle in accordance with the present invention includes: a suction hole 110 formed in a bottom of a housing 100 having a predetermined shape; an air channel 120 formed as a closed region having predetermined area and depth in the bottom of the housing 100, and having the suction hole 110 therein; and a scraper 140 longer than an end of an edge of the air channel, positioned in the air channel 120, and for scraping carpet fibers in cleaning the carpet.

An inner path (F) is formed in the housing, and a suction hole 110 for forming the inner path (F) is formed in the bottom of the housing 100. The inner path (F) of the housing 100 is connected to a cleaner main body whereby a suction force is applied thereto, and the bottom of the housing 100 puts on a floor in cleaning.

The air channel 120 is relatively short in its width and long in its length when viewed in a direction that a cleaning proceeds. Preferably, the air channel 120 is formed in a rectangular shape.

In addition, the air channel 120 is divided into a first region 121 having certain width and length and positioned in front, and a second region having certain width and length and positioned in rear. A scraper 140 is positioned in the first region, and a section hole 110 is positioned within the second region 122. The first region 121 is formed in a rectangular shape and its bottom (on drawing) is a plane. The suction hole 110 is positioned in the middle of the second region 122, and a bottom (on drawing) of the second region 122 is formed inclined on the basis of the suction hole 110.

As shown in Figure 7, the scraper 140 includes a quadrangular plate portion 141 having certain width and area; a plurality of notches 142 formed at an end portion of the plate portion 141; and a coupling portion 143 formed at the opposite side of the notches 142 and coupled to a bottom of the air channel 120. The scraper 140 may be made of a material having stiffness, or of a material having flexibility.

The scraper 140 is positioned in a direction perpendicular to the bottom of the first region 121, and the scraper 140 is fixedly coupled to the bottom of the first region 121. An end of the scraper 140, an end of a portion to which the notches 142 are positioned, is longer than a height of a bottom edge 130 forming the air channel 120. That is, when putting housing so that the air channel 120 puts on a floor, the end of the scraper 140 is longer than the bottom edge 130 forming the air channel 120.

As a modified form of the notches 142, the notches 142 may be formed at intervals which are not certain. In addition, the notches 142 may be formed in a triangular shape one side of which is opened.

As a modified form of the air channel 120, a first region having certain width and length is formed in front, and a second region having certain width and length is formed in rear. A section hole 110 is positioned in the first region, and a scraper 140 is positioned in the second region. The suction hole 110 is positioned in the middle of the first region, and is formed inclined on the basis of the suction hole 110. A bottom (on drawing) of the second region is formed in a plane.

Reference numerals which have not been explained, 132, 133, 134, 135 are a front edge, a rear edge, a right edge and a left edge (on drawing) forming an edge of the air channel, respectively.

Figure 8 is a view showing another embodiment of the suction nozzle in accordance with the present invention. The same parts as the above mentioned part will have the same numerals.

As shown therein, the section nozzle includes a suction hole 110 formed in the bottom of a housing 110 having a predetermined shape; an air channel 120 formed as a closed region having predetermined area and depth, in the bottom of the housing 100, and having the suction hole 110 therein; and two scrapers 150, 160 longer than an end of an edge 130 of the air channel 120, positioned in the air channel 120, and for scraping carpet fibers in cleaning a carpet.

The air channel 120 is divided into a first region 121 having certain width and length and positioned in front and a second region 122 having certain width and length and positioned in rear. Two scrapers 150, 160 are positioned in the first region, and a suction hole 110 is positioned within the second region 122. The first region 121 is formed in a quadrangular shape and its bottom (on drawing) is a plane. The suction hole 110 is positioned in the middle of the second region 122, and a bottom (on drawing) of the second region 122 is formed inclined on the basis of the suction hole 110.

The scrapers 150, 160 include: quadrangular plate portions 151, 161 having certain width and area; a plurality of notches 152, 162 formed at end portions of the plate portions 151, 161; and coupling portions 153, 163 formed at the opposite side of the notches 152, 162 and coupled to a bottom of the air channel 120.

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The scrapers 150, 160 are positioned in a direction perpendicular to the bottom of the first region 121, and the coupling portions 153, 163 are fixedly coupled to the bottom of the first region 121, respectively. Preferably, the notches 152, 162 of the two scrapers 150, 160 are alternatively positioned. The scrapers 150, 160 may be integrally formed with the bottom of the first region 121.

The scrapers 150, 160 may be made of a material having stiffness, or of a material flexibility. Figure 9 is a sectional view showing still another embodiment of a suction nozzle in accordance with the present invention. The same parts as the above mentioned parts will have the same numerals.

As shown therein, the suction nozzle includes a suction hole 110 to which a suction force is applied; an air channel 120 formed as a closed region having predetermined area and depth, and having the suction hole 110 therein; a scraper 140 longer than an end of an edge 130 of the air channel 120, positioned in the air channel, and for scraping carpet fibers in cleaning a carpet; and side passages 131 through which air passes, and formed at both sides of the air channel 120 when viewed in a direction that the air channel 120 proceeds in cleaning.

In the suction nozzle, components except the side passages 131 are the same as explained above.

The side passages 131 having certain width and depth are formed at side edges forming side portions of the air channel 120. That is, the side passages 131 are formed at both sides of the air channel when viewed in a direction that a cleaning proceeds.

Figure 10 is a view showing one embodiment of a cleaner head with a suction nozzle in accordance with the present invention. The same parts as the above mentioned parts will have the same numerals.

As shown in Figure 10, a cleaner head with a suction nozzle in accordance with the present invention includes a housing 100 including an inner path (F) to which a suction force is applied; an air channel 120 formed as a closed region having predetermined area and depth in a bottom of the housing which comes in contact with the carpet or the floor.

Slots 102 are movably inserted in the housing 100 by controlling the mode changing means. The mode changing means is a known art which is generally used for a cleaner, and by controlling the mode changing means, the front blade 180 and the rear blade 190 are moved.

If the front blade 180 and the rear blade 190 are protruded from the bottom of the housing by controlling the mode changing means, ends of the front blade 180 and the rear blade 190 become higher than that of the scraper 140. And, when the front blade 180 and the rear blade 190 move into the housing by controlling the mode changing means, ends of the front blade 180 and the rear blade 190 become lower than an edge 130 of the inner air channel 120 when viewed based on the bottom of the housing. At this time, the end of the scraper 140 is higher than the edge 130 of the inner air channel.

That is, in a state that the housing 100 is put on a carpet or a floor in order to clean the floor and the carpet, when the front blade 180 and the rear blade 190 are fixed protruded from the bottom of the housing 100 by controlling the mode changing means, the end of the scraper 140 comes in contact with the carpet or the floor. Also, when the front blade 180 and the rear blade 190 are fixed inserted into the housing 100 by controlling the mode changing means, the end of the scraper 140 comes in contact with the carpet or the floor.

The front blade 180 and the rear blade 190 are made of a material having stiffness, or a material having flexibility, but, preferably, the front blade 180 is made of a material having stiffness and the rear blade 190 is made of a material having flexibility.

There may be two scrapers 140. A reference numeral which has not been explained, 103 is a knob composing the mode changing means.

Hereinafter, operational effect of a suction nozzle and a cleaner head having the same in accordance with the present invention will now be described.

First, operations of the suction nozzle will now be described.

As a cleaner operates, a suction force is applied to a suction hole 110 of a suction nozzle. In a state that a suction nozzle is put on a carpet so that an air channel 120 of the suction nozzle puts on the carpet, a user moves...
the suction nozzle in forward and backward direction. At this time, as shown in Figure 11, an end of the scraper 140 and the rear edge 133 of the air channel 120 come in contact with the carpet, and a suction path through which external air is introduced is formed by a gap between the carpet and the front edge 132 of the air channel 120 and the air channel 120. Especially, the notches 142 formed at the end of the scraper 140 form sufficient paths through which air is introduced, and, as controlling the sizes of the notches 142, flow resistance of air and suction force can be controlled.

[0072] External air is introduced through the suction path by a suction force applied to the suction hole 110, and herein, the air is sucked, together with alien substances such as dust in the carpet. In such a process, the scraper 140 positioned in the air channel 120 moves with the housing 110 to push back carpet fibers, thereby sucking air into the suction hole 110, together with alien substances such as dust positioned at roots of carpet fibers.

[0073] The scraper 140 is much longer than the front and rear edges 132, 133 forming the air channel 120, thereby sufficiently pushing back the carpet fibers, so that alien substances such as dust, crumbs, sand or the like which are positioned at the roots of the carpet fibers are efficiently sucked. In addition, the scraper 140 is positioned in the air channel 120, and also forms a suction path in a direction that a cleaning proceeds, so that alien substances on the carpet are sucked and removed effectively.

[0074] As shown in Figure 12, if the scraper 140 is positioned in a direction perpendicular to the carpet, a suction path opened in every direction is formed between the carpet and an entire edge 130 forming the air channel 120 by the scraper 140.

[0075] External air is introduced in front, rear, left and right directions through the suction path by a suction force applied to the suction hole 110, and herein the air is sucked, together with alien substances on the carpet. In such a process, the scraper 140 positioned in the air channel 120 moves with the suction nozzle, that is, housing, to push back carpet fibers, thereby sucking air into the suction hole 110, together with alien substances positioned at roots of the fibers.

[0076] If there are two scrapes 140, the carpet fibers are pushed back more constantly, so that alien substances piled up at the roots of the carpet fibers are more effectively removed.

[0077] In case that side passages 131 are formed at left and right edges 134, 135 forming the air channel 120, when air suction resistance becomes excessive in a suction path formed between the carpet and the edge 130 of the air channel 120 by the scraper 140, the air suction resistance is controlled by enlarging the size of the suction path.

[0078] In addition, operations of a head of a cleaner with a suction nozzle in accordance with the present invention will now be described.

First, when cleaning a carpet, as shown in Figure 13, the front blade 180 and the rear blade 190 are moved into the housing and are fixed by controlling a knob 103 of the mode changing means. When the front blade 180 and the rear blade 190 are positioned in the housing, a suction path is formed by a scraper 140 and an inner air channel 120., the carpet is cleaned with the same operations as explained above by such a structure. At this time, a suction force according to a direction of the suction path, air flow resistance, and the like is determined by locations and sizes of wheels mounted to the housing 100, a barycenter of the cleaner head, the scraper 140, an edge of the inner air channel and the like.

[0080] When cleaning a flat non-carpeted floor, as shown in Figure 14, the front blade 180 and the rear blade 190 are fixed protruded from the bottom of the housing by controlling the knob 103 of the mode changing means, and by the protruded front blade 180 and rear blade 190 is formed an outer air channel 170. When the front blade 180 and the rear blade come in contact with the floor, a suction path through which external air is introduced is formed at the sides by the outer air channel 170 and the floor. When a suction force is applied to the suction hole 110, alien substances such as dust or the like piled up on the floor are sucked with air and are removed into the suction hole 110.

[0081] The cleaner head with a suction nozzle in accordance with the present invention can clean a carpet as well as a non-carpeted floor. Especially, when cleaning a carpet, the cleaner head with a suction nozzle in accordance with the present invention effectively removes alien substances such as dust or the like which are deeply piled up at carpet fibers.

[0082] As so far described, a suction nozzle and a head of a vacuum cleaner having the same, can effectively clean a non-carpeted floor, and also, in cleaning a carpet, sufficiently pushes back carpet fibers to their roots by a scraper to suck alien substances such as dust, crumbs, sand or the like. Accordingly, a carpet can be cleaned more cleanly, and also, a suction path through which external air is introduced is formed in a direction that a cleaning proceeds, that is, in a forward direction, to effectively introduce and remove alien substances, so that the carpet can be easily and speedily cleaned.

[0083] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

Claims

1. A suction nozzle comprising:

a suction hole (110) to which a suction force is
applied;
an air channel (120) formed as a closed region
having predetermined area and depth, and hav-
ing the suction hole therein; and
a scraper (140; 150, 160) longer than an end of
an edge of the air channel, positioned in the air
channel (120), for scraping carpet fibers in
cleaning the carpet, characterised in that
the scraper (140; 150, 160) comprises a quadran-
gular plate portion (141; 151, 161) having certain
thickness and area; and a plurality of notches
(142; 152, 162) formed at the end portion of the
plate portion,
wherein the plurality of notches (142; 152, 162)
form suction paths through which air is intro-
duced in a direction that a cleaning proceeds.

2. The suction nozzle of claim 1, wherein the air channel
(120) is formed in a quadrangular shape which is
short in its width and long in its length when viewed
in a direction that a cleaning proceeds

3. The suction nozzle of claim 1, wherein the air channel
(120) is divided into a first region (121) having certain
width and length and positioned in front and a second
region (122) having certain width and length and po-
sitioned in rear, the scraper (140; 150, 160) is posi-
tioned in the first region (121), and the suction hole
(110) is positioned in the second region (122).

4. The suction nozzle of claim 3, wherein the suction
hole (110) is positioned in the first region (121), and
the scraper (140) is positioned in the second region
(122).

5. The suction nozzle of claim 3, wherein the second
region (122) is formed inclined on the basis of the
suction hole (110).

6. The suction nozzle of claim 3, wherein the first region
(121) is a plane.

7. The suction nozzle of claim 1, wherein the scraper
(140; 150, 160) further comprises:
a coupling portion (143; 153, 163) formed at the
opposite side of the notches (142; 152, 162),
and coupled to a bottom of the air channel (120).

8. The suction nozzle of claim 7, wherein the notches
(142) are formed at certain intervals therebetween.

9. The suction nozzle of claim 7, wherein the notches
(142) are formed at intervals which are not certain.

10. The suction nozzle of claim 7, wherein the notches
(142) are formed in a quadrangular shape.

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11. The suction nozzle of claim 7, wherein the notches
(142) are formed in a triangular shape.

12. The suction nozzle of claim 7, wherein the notches
(142) are respectively positioned at both ends of the
plate portion (141).

13. The suction nozzle of claim 1, wherein there are two
scrapers (150, 160), notches (152, 162) are respec-
tively formed at both end portions of the two scrapers,
and the notches formed at the two scrapers are al-
ternatively formed.

14. The suction nozzle of claim 1, wherein the scraper
(140; 150, 160) is made of a material having flexibil-
ity.

15. The suction nozzle of claim 1, further comprising
side passages (131) respectively formed at both side
edges of the air channel (120) and through which air
passes.

16. A head of a vacuum cleaner comprising:
a housing (100);
a front blade (180) and a rear blade (190); and
a mode changing means mounted in the hous-
ing;
wherein
the housing (100) comprises a suction nozzle as
claimed in any one of claims 1-15,
the air channel (120) is formed in a bottom of the
housing (100) which comes in contact with a
floor,
the front blade (180) and the rear blade (190)
are movably inserted to the front and the rear of
the air channel (120) respectively, and form an
outer air channel (170) in cleaning the floor; and
the mode changing means is fixing the front
blade (180) and the rear blade (190) by pushing
or pulling them.

17. The head of vacuum cleaner of claim 16, wherein a
plurality of notches (181) is formed at an end of the
front blade (180).

Patentansprüche

1. Saugdüse mit:
einem Saugloch (110), auf das eine Saugkraft
ausgeübt wird;
einem Luftkanal (120), der als ein geschlosse-
ner Bereich mit einer vorgegebenen Fläche und
Tiefe ausgebildet ist und darin das Saugloch
aufweist; und
einem Abstreifer (140; 150, 160), der länger als
ein Ende einer Kante des Luftkanals ist, der im Luftkanal (120) angeordnet ist, zum Abstreifen von Teppichfasern bei der Reinigung des Teppichs dient, dadurch gekennzeichnet, dass der Abstreifer (140; 150, 160) einen viereckigen Plattenabschnitt (141; 151, 161) mit einer bestimmten Dicke und Fläche und mehrere Nuten (142; 152, 162) aufweist, die am Endabschnitt des Plattenabschnitts ausgebildet sind, wobei die mehreren Nuten (142; 152, 162) Saugwege bilden, durch die Luft in eine Richtung eingeleitet wird, in die eine Reinigung abläuft.

2. Saugdüse nach Anspruch 1, wobei der Luftkanal (120) in einer viereckigen Form ausgebildet ist, die in ihrer Breite kurz ist und in ihrer Länge lang ist, wenn sie in einer Richtung betrachtet wird, in die eine Reinigung abläuft.

3. Saugdüse nach Anspruch 1, wobei der Luftkanal (120) in einen ersten Bereich (121), der eine bestimmte Breite und Länge aufweist und vorn angeordnet ist, und einen zweiten Bereich (122) unterteilt ist, der eine bestimmte Breite und Länge aufweist und hinten angeordnet ist, wobei der Abstreifer (140; 150, 160) im ersten Bereich (121) angeordnet ist und das Saugloch (110) im zweiten Bereich (122) angeordnet ist.

4. Saugdüse nach Anspruch 3, wobei das Saugloch (110) im ersten Bereich (121) angeordnet ist und der Abstreifer (140) im zweiten Bereich (122) angeordnet.

5. Saugdüse nach Anspruch 3, wobei der zweite Bereich (122) an der Basis des Sauglochs (110) geneigt ausgebildet ist.

6. Saugdüse nach Anspruch 3, wobei der erste Bereich (121) eine Ebene ist.

7. Saugdüse nach Anspruch 1, wobei der Abstreifer (140; 150, 160) ferner aufweist:

   einen Kopplungsabschnitt (143; 153, 163), der auf der gegenüberliegenden Seite der Nuten (142; 152, 162) ausgebildet und mit einem unteren Teil des Luftkanals (120) gekoppelt ist.

8. Saugdüse nach Anspruch 7, wobei die Nuten (142) an bestimmten Intervallen dazwischen ausgebildet sind.

9. Saugdüse nach Anspruch 7, wobei die Nuten (142) an Intervallen ausgebildet sind, die nicht bestimmt sind.

10. Saugdüse nach Anspruch 7, wobei die Nuten (142) in einer viereckigen Form ausgebildet sind.

11. Saugdüse nach Anspruch 7, wobei die Nuten (142) in einer dreieckigen Form ausgebildet sind.

12. Saugdüse nach Anspruch 7, wobei die Nuten (142) jeweils an beiden Enden des Plattenabschnitts (141) angeordnet sind.


15. Saugdüse nach Anspruch 1, die ferner aufweist:

   seitliche Durchgänge (131), die jeweils an beiden Seitenkanten des Luftkanals (120) ausgebildet sind und durch die Luft geht.

16. Kopf eines Staubsaugers, der aufweist:

   ein Gehäuse (100); eine vordere Lamelle (180) und eine hintere Lamelle (190); und eine Betriebsartwechseleinrichtung, die im Gehäuse angebracht ist; wobei das Gehäuse (100) eine Saugdüse nach einem der Ansprüche 1-15 aufweist, der Luftkanal (120) in einem unteren Teil des Gehäuses (100) ausgebildet ist, der mit einem Boden in Kontakt kommt, die vordere Lamelle (180) und die hintere Lamelle (190) jeweils beweglich in das Vorderteil und das Hinterteil des Luftkanals (120) eingefügt sind und bei der Reinigung des Bodens einen äußeren Luftkanal (170) bilden; und die Betriebsartwechseleinrichtung die vordere Lamelle (180) und die hintere Lamelle (190) fixiert, indem sie auf sie drückt oder an ihnen zieht.

17. Kopf eines Staubsaugers nach Anspruch 16, wobei mehrere Nuten (181) an einem Ende der vorderen Lamelle (180) ausgebildet sind.

Revidications

1. Buse d’aspiration comprenant:
un trou d’aspiration (110) auquel une force d’aspiration est appliquée ;
un canal d’air (120) formé comme une région fermée ayant une surface et une profondeur prédéterminées, le trou d’aspiration étant dans ce canal d’air ; et
un racloir (140 ; 150, 160) plus long qu’une extrémité d’un bord du canal d’air, positionné dans le canal d’air (120), pour racler des fibres de tapis lors du nettoyage du tapis, caractérisée en ce que :

le racloir (140 ; 150, 160) comprend une partie en forme de plaque quadrangulaire (141 ; 151, 161) ayant une certaine épaisseur et une certaine surface ; et plusieurs encoches (142 ; 152, 162) formées au niveau de la partie d’extrémité de la partie en forme de plaque, les encoches (142 ; 152, 162) formant des trajectoires d’aspiration à travers lesquelles de l’air est introduit dans une direction de progression du nettoyage.

2. Buse d’aspiration selon la revendication 1, dans laquelle le canal d’air (120) est formé selon une forme quadrangulaire qui est courte dans sa largeur et longue dans sa longueur, lorsqu’il est observé dans une direction de progression du nettoyage.

3. Buse d’aspiration selon la revendication 1, dans laquelle le canal d’air (120) est divisé en une première région (121) ayant une certaine largeur et une certaine longueur et positionnée à l’avant et une deuxième région (122) ayant une certaine largeur et une certaine longueur et positionnée à l’arrière, le racloir (140 ; 150, 160) est positionné dans la première région (121), et le trou d’aspiration (110) est positionné dans la deuxième région (122).

4. Buse d’aspiration selon la revendication 3, dans laquelle le trou d’aspiration (110) est positionné dans la première région (121), et le racloir (140) est positionné dans la deuxième région (122).

5. Buse d’aspiration selon la revendication 3, dans laquelle la deuxième région (122) est formée avec uneinclinaison par rapport au trou d’aspiration (110).

6. Buse d’aspiration selon la revendication 3, dans laquelle la première région (121) est un plan.

7. Buse d’aspiration selon la revendication 1, dans laquelle le racloir (140 ; 150, 160) comprend en outre :

une partie de couplage (143 ; 153, 163) formée au niveau du côté opposé des encoches (142 ; 152, 162) et coupée à un fond du canal d’air

(120).

8. Buse d’aspiration selon la revendication 7, dans laquelle les encoches (142) sont formées à intervalles réguliers entre elles.

9. Buse d’aspiration selon la revendication 7, dans laquelle les encoches (142) sont formées à des intervalles qui ne sont pas réguliers.

10. Buse d’aspiration selon la revendication 7, dans laquelle les encoches (142) sont formées selon une forme quadrangulaire.

11. Buse d’aspiration selon la revendication 7, dans laquelle les encoches (142) sont formées selon une forme triangulaire.

12. Buse d’aspiration selon la revendication 7, dans laquelle les encoches (142) sont respectivement positionnées aux deux extrémités de la partie en forme de plaque (141).

13. Buse d’aspiration selon la revendication 1, dans laquelle il y a deux racloirs (150, 160), les encoches (152, 162) sont respectivement formées au niveau des deux parties d’extrémité des deux racloirs, et les encoches formées au niveau des deux racloirs sont formées de manière alternée.

14. Buse d’aspiration selon la revendication 1, dans laquelle le racloir (140 ; 150, 160) est réalisé avec un matériau présentant une certaine souplesse.

15. Buse d’aspiration selon la revendication 1, comprenant en outre :

des passages latéraux (131) respectivement formés au niveau des deux bords latéraux du canal d’air (120) et à travers lesquels l’air passe.

16. Tête d’aspirateur comprenant :

un boîtier (100) ;
une lame avant (180) et une lame arrière (190) ;
et des moyens de changement de mode montés dans le boîtier ;
dans laquelle :

le boîtier (100) comprend une buse d’aspiration selon l’une quelconque des revendications 1 à 15, le canal d’air (120) est formé dans un fond du boîtier (100) qui vient en contact avec un sol, la lame avant (180) et la lame arrière (190)
sont insérées de manière mobile à l’avant et à l’arrière du canal d’air (120) respectivement, et forment un canal d’air externe (170) pour nettoyer le sol ; et les moyens de changement de mode fixent la lame avant (180) et la lame arrière (190) en les poussant ou en les tirant.

17. Tête d’aspirateur selon la revendication 16, dans laquelle plusieurs encoches (181) sont formées au niveau d’une extrémité de la lame avant (180).
REFERENCES CITED IN THE DESCRIPTION

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