

Aug. 27, 1940.

F. J. R. KARLSTRÖM

2,212,942

SUCTION NOZZLE

Filed April 16, 1937

4 Sheets-Sheet 1

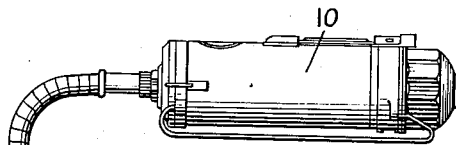


Fig. 1.

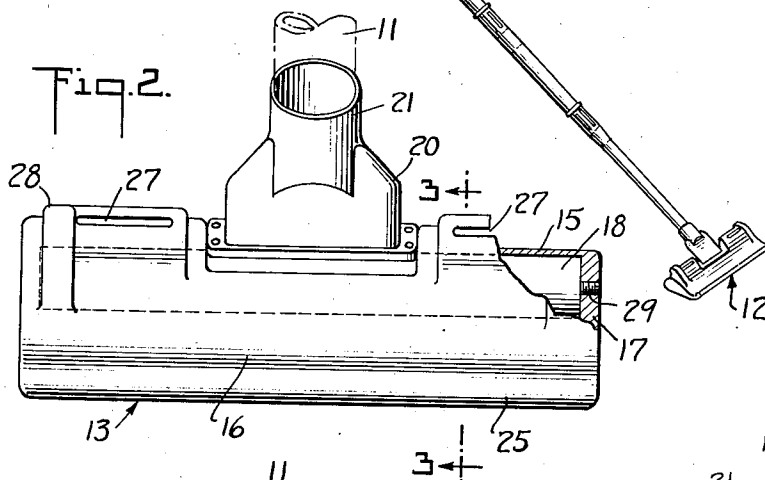


Fig. 2.

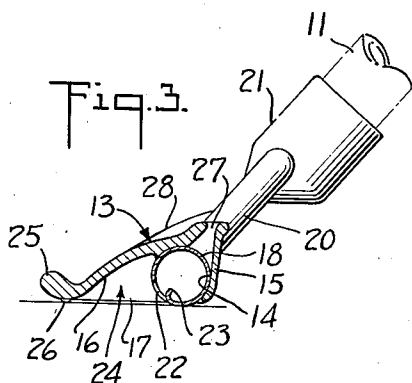


Fig. 3.

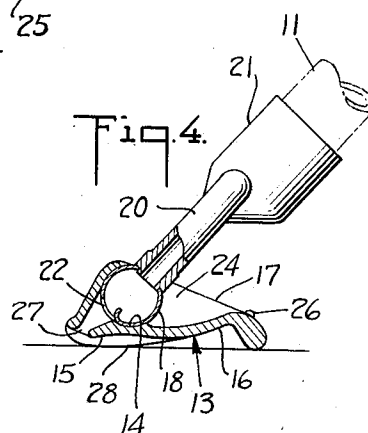


Fig. 4.

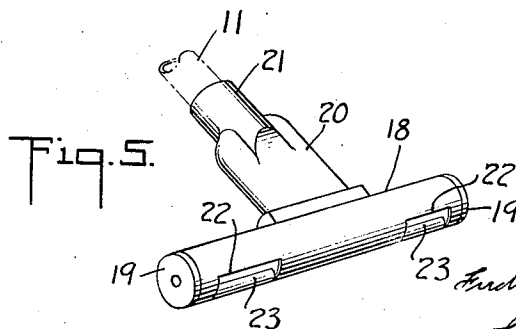


Fig. 5.

INVENTOR
Ernst John Robert Karlström
BY
Thomas C. Beth
ATTORNEY

Aug. 27, 1940.

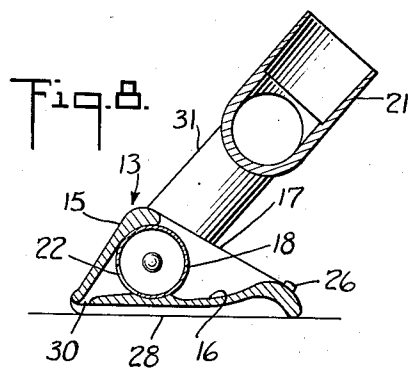
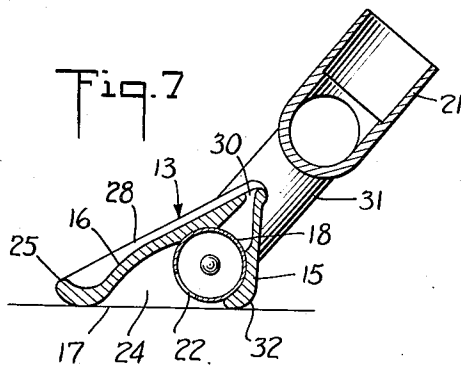
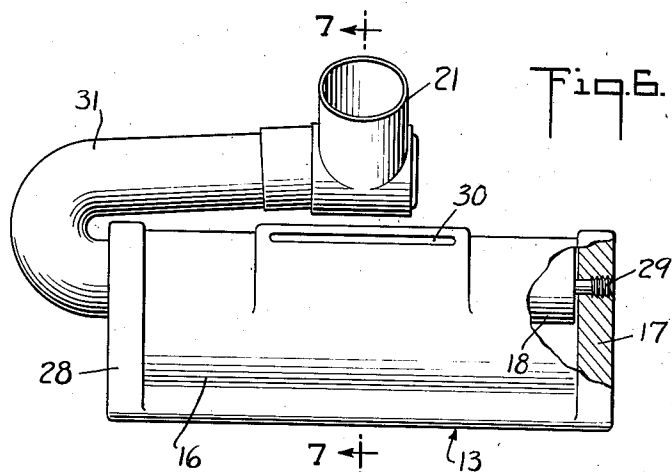
F. J. R. KARLSTRÖM

2,212,942

SUCTION NOZZLE

Filed April 16, 1937

4 Sheets-Sheet 2



INVENTOR
Erdrik Johan Robert Karlström
BY
Thomas G. Betts
his ATTORNEY

Aug. 27, 1940.

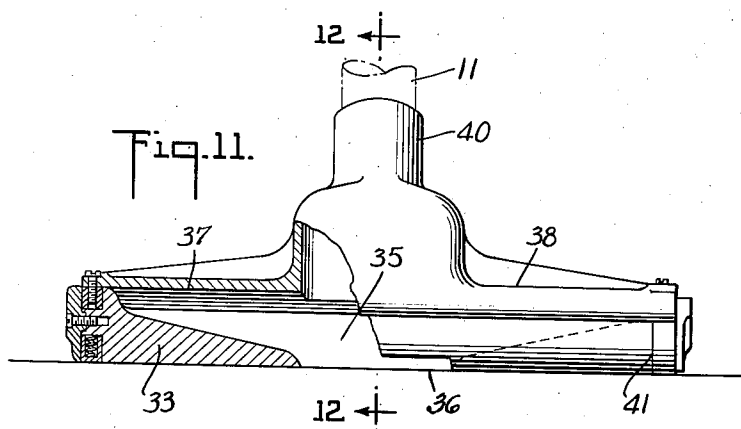
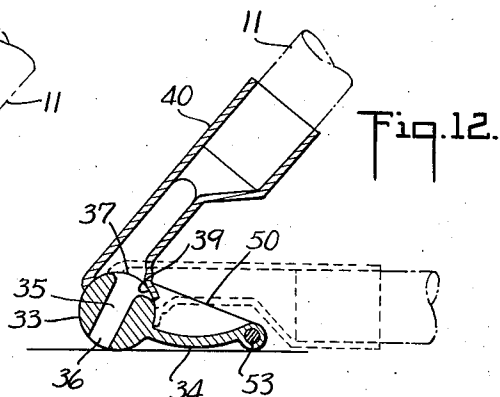
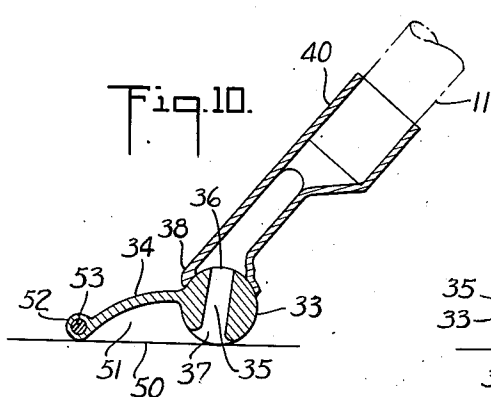
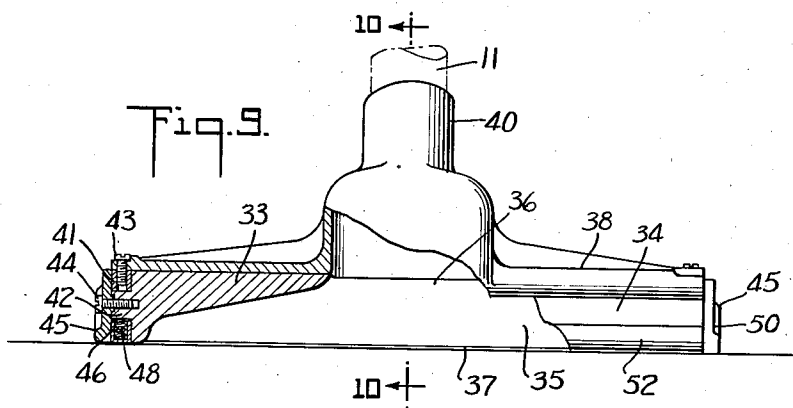
F. J. R. KARLSTRÖM

2,212,942

SUCTION NOZZLE

Filed April 16, 1937

4 Sheets-Sheet 3



INVENTOR
Fredrik Johan Robert Karlström
BY
Thomas E. Betts
ATTORNEY

Aug. 27, 1940.

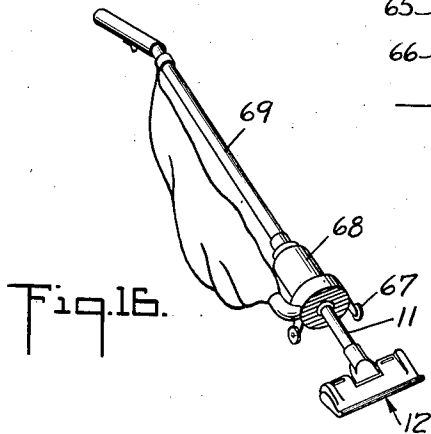
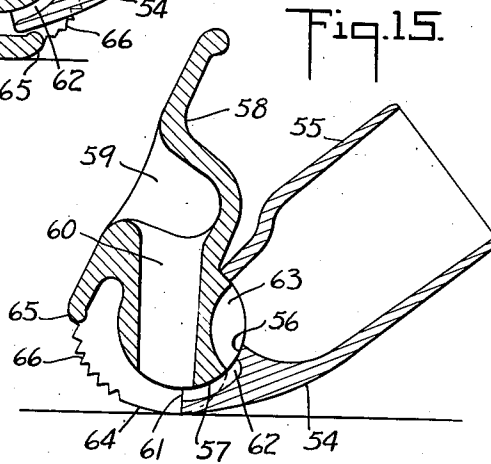
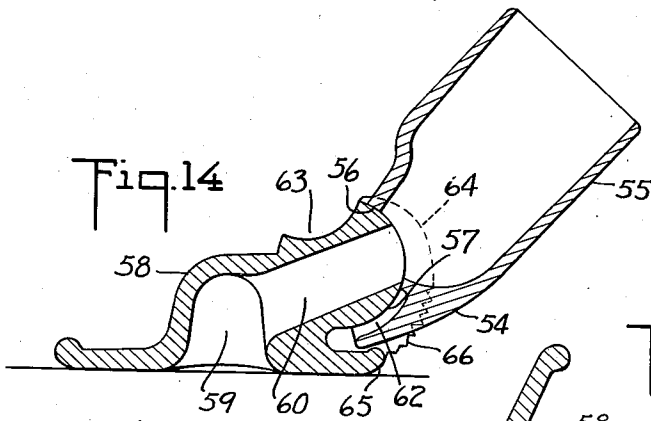
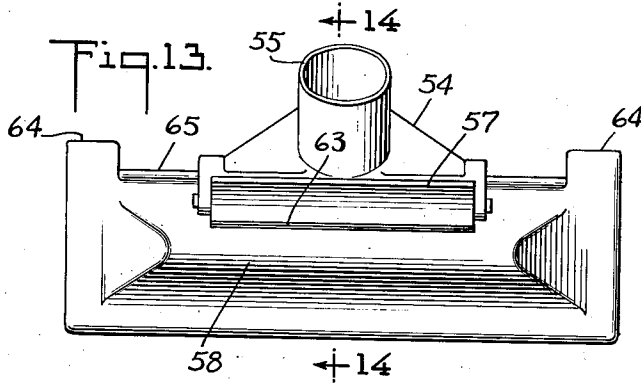
F. J. R. KARLSTRÖM

2,212,942

SUCTION NOZZLE

Filed April 16, 1937

4 Sheets-Sheet 4



INVENTOR
Fredrik Johan Robert Karlström
BY
Thomas C. Betts
ATTORNEY

UNITED STATES PATENT OFFICE

2,212,942

SUCTION NOZZLE

Fredrik Johan Robert Karlström, Bo, Sweden,
 assignor to Electrolux Corporation, Dover, Del.,
 a corporation of Delaware

Application April 16, 1937, Serial No. 137,182
 In Germany April 18, 1936

7 Claims. (Cl. 15—156)

This invention relates to suction nozzles for vacuum cleaners or the like and more particularly to a nozzle having a plurality of different suction openings which are interchangeable to permit the cleaner to efficiently pick up different objects. One opening may, for example, be suitable for dust and another opening may be suitable for picking up fine threads or the like.

An object of the invention is to provide a novel and improved nozzle of the type above indicated.

Another object is to provide a nozzle of the above type which is adapted to be used where space is limited, such as under low articles of furniture.

Another object is to provide a nozzle of the above type in which the suction openings can be shifted while in such limited space.

Another object is to provide a nozzle in which the suction openings can be shifted by a simple forward or backward movement thereof.

Other objects and advantages will be apparent from the following description, taken in connection with the accompanying drawings, in which certain specific embodiments of the invention are set forth for purposes of illustration only.

In the drawings:

Fig. 1 is a side elevation of a cleaner and nozzle embodying the present invention;

Fig. 2 is a broken plan view of the nozzle shown in Fig. 1;

Fig. 3 is a section taken along the line 3—3 of Fig. 2;

Fig. 4 is a similar section showing the nozzle reversed in position for using the small suction opening;

Fig. 5 is a perspective view of the suction head;

Fig. 6 is a broken plan view of a nozzle illustrating another embodiment of the invention;

Fig. 7 is a section taken on the line 7—7 of Fig. 6;

Fig. 8 is a similar section showing the nozzle reversed for using the small suction opening;

Fig. 9 is a front elevation, partly in section, on a nozzle illustrating a third embodiment of the invention;

Fig. 10 is a section taken on the line 10—10 of Fig. 9;

Fig. 11 is a front elevation, partly in section, similar to Fig. 9, but showing the small suction opening in operating position;

Fig. 12 is a section taken along the line 12—12 of Fig. 11;

Fig. 13 is a plan view of a nozzle illustrating still another embodiment of the invention;

Fig. 14 is a section taken along the line 14—14 of Fig. 13;

Fig. 15 is a similar section showing the small suction opening in operating position; and

Fig. 16 is a perspective view of a bag type vacuum cleaner having a nozzle constructed in accordance with the present invention.

In the following description and in the claims certain specific terms are used for convenience in referring to various details. These terms, however, are to be interpreted as broadly as the state of the art will permit.

Referring to the drawings, the invention is shown in Fig. 1 as applied to a vacuum cleaner 10 of standard and well known construction having a suction conduit 11 attached thereto, to which is connected a nozzle 12. The nozzle consists of a body 13 which may be made of any desired material, such as synthetic resin, metal or the like. As shown in Figs. 2 to 4, this body is made comparatively flat for use under very low objects. It consists of a rear wall 15 having a concave cylindrical surface 14, and a front wall 16 which is slightly arched to provide a suction opening 24. Side walls 17 are provided at the ends of the front and rear walls 16 and 15, respectively.

The suction head, which is shown in detail in Fig. 5, consists of a cylindrical member 18 which may be provided with end walls 19. At the center of the member 18 there is firmly connected a comparatively flat connection piece 20 which extends into a connector 21 adapted to receive the end of the conduit 11. The suction head 18 is provided, in the embodiment shown, with two longitudinal suction inlet openings 22. In order to prevent damage to the object to be cleaned the lower edges of the openings 22 may be bent upwardly as at 23.

The large suction opening 24 is defined by the front wall 16, the suction head 18, and the side walls 17. The outer edge 25 of the front wall 16 is flared upwardly and may be provided with bosses 26 which are spaced apart to elevate the edge 25 above the supporting surface so as to provide space for passage of suction air to the nozzle. The bosses 26 may consist of the rounded heads of nails embedded in the material of the nozzle body.

The smaller suction openings 27 are formed in the back wall 15 of the nozzle. In the embodiment shown two such openings 27 are provided. At one end of the small suction openings 27 or on the side wall 17 of the body, raised flanges 28 are provided which can be made integral with

the nozzle body if desired. The flanges 28 serve to elevate the small suction opening slightly from the surface to be cleaned, so that the edge of the nozzle itself does not press the objects to be drawn in, such as yarn and the like, into such surface.

As assembled, the cylindrical suction head 18 rests in the concave cylindrical surface 14 of the nozzle body 13 and is pivotally secured thereto by bearing pins 29, which pass through the side walls 17 of the nozzle body 13 and through the end walls 19 of the suction head 18. The suction head 18 is positioned at one side of the nozzle body 13, so that the body pivots when the suction head is raised from the supporting surface. Either of the suction openings can, accordingly, be connected by raising the nozzle body slightly and moving the same either toward the front or rear. The small suction openings 27 are brought into cleaning position (Fig. 4) by moving the nozzle body forwardly and the large suction opening 24 is brought into cleaning position (Fig. 3) by moving the nozzle body backwardly.

In the embodiment shown in Figs. 6 to 8, the nozzle body is provided with a single small suction opening 30 which is arranged in the center thereof. The connection between the suction head 18 and the connector 21 is effected by a U-shaped tube 31 which is rigidly attached to one end of the suction head 18. If desired, a similar U-shaped tube (not shown) can also connect the other end of the suction head 18 with the connector 21.

In this embodiment the large suction opening 24 is defined by the nozzle body 13 which is generally similar to that of Figs. 1 to 5 and the parts of which are identified by the same reference characters. The rear wall 15 is extended downwardly as at 32, to engage the surface to be cleaned. The suction head 18 is accordingly held out of contact with such surface. The nozzle body is shifted to bring either the large or the small suction opening into cleaning position as shown in Figs. 7 and 8, respectively, in the manner pointed out above.

In the embodiment shown in Figs. 9 through 12, the entire nozzle body is adapted to be made of plastic or molded material or the like. The nozzle body consists of a cylindrical part 33 from which a slightly arched wall 34, similar to the wall 16 of the embodiment of Figs. 2 to 5 projects in radial or tangential direction. The cylindrical part 33 is provided with a slit 35 passing transversally therethrough and terminating at opposite sides of the cylindrical part 33 in openings 36 and 37 of different sizes. The suction head 38 is provided with a concave cylindrical surface 39 resting against the circumference of the cylindrical part 33 and may be made integral with a connection member 40. The cylindrical part 33 and the suction head 38 are pivotally joined together by rings 41 which are mounted on the ends of the suction head 38 by screws 43. The cylindrical part 33 is provided at its ends with circular extensions 42 which are journaled in the rings 41, so as to permit free pivotal movement of the nozzle. The extensions 42 may be made somewhat smaller than the rings 41 so as to permit a slight amount of play between the parts. Fine particles, such as dust, accordingly cause displacement of the nozzle body instead of lodging between and damaging the surfaces. A disk 45 is attached to each extension 42 of the cylindrical part 33 by means of a screw 44. The ring 41 is provided with a lower radial bore 46,

into the upper open end of which is inserted a spring 48 which bears against the extension 42 to resiliently hold the same in place, but to permit the cylindrical part 33 to be displaced slightly with respect to the cylindrical surface 39 for the above mentioned purpose.

The nozzle body is provided with side walls 50, which may be made integral with the discs 45. The large suction opening 51 is defined by the wall 34, the side walls 50 and the cylindrical part 33. The small suction opening is formed directly by the smaller opening 36 of the slit 35. If desired, the edges of the openings 36 and 37 may be made somewhat rounded so as to prevent injury to the surface to be cleaned. The front edge 52 of the wall 34 may be provided with small elevations, spaced from each other to elevate the same above the supporting surface. A weight 53 may be provided on this edge to facilitate the pivotal movement of the nozzle body for shifting the suction openings when the nozzle body is elevated from the supporting surface. Runners or slides (not shown) may be formed on the nozzle body to provide a larger bearing surface when the small suction opening is connected for use. This embodiment may be shifted to the positions shown in Figs. 10 and 12 to connect the large and small suction openings, respectively, for use.

In the embodiment shown in Figs. 13 to 15, the suction head 54, which may be made integral with a connection member 55, is provided with a concave cylindrical surface 56 against which there rests a cylindrical surface 57 of the nozzle body 58. The large suction opening 59, in its operating position, is connected with the member 55 by means of a channel 60 passing through the nozzle body. The smaller suction opening 61 is formed partly by a recess 62 in the suction head 54 and partly by a notch 63 in the nozzle body 58.

On the sides of the nozzle body 58 there are arranged runners 64 which may be circular in form. The portion of the runners 64 adjacent the rear edge 65 of the nozzle body 58 may be provided with a friction surface, such, for example, as teeth or serrations 66. If the large suction nozzle is in position, as shown in Fig. 14, it is only necessary for the operator to press the nozzle body against the supporting surface by means of the handle of the cleaner and at the same time to pull the handle slightly to the rear. The toothed part 65 of the runner 64 thus engages the supporting surface and causes the nozzle body to pivot to the position shown in Fig. 15, in which the small suction opening 61 is connected for use.

The friction surface of the runners may extend only to a position to shift the nozzle body until its center of gravity has passed the vertical position, leaving the remaining parts of the runners smooth so as not to injure the surface to be cleaned. The nozzle body may again be shifted to the position shown in Fig. 14, by swinging the handle slightly forward until the center of gravity of the nozzle body has passed the vertical position, whereupon the weight of the nozzle body serves to complete the pivotal movement thereof.

Other friction means such as, for instance, a rubber surface or the like, may be substituted for the serrations 66, if desired. The suction head may be forked and may be attached to the cylindrical part of the nozzle in any convenient manner, such as by bolts or the like.

In Fig. 16 a nozzle body, constructed in accordance with this invention, is connected with a vacuum cleaner 68 of the bag type having wheels

67, which may be used as the fulcrum for elevating the nozzle body from the supporting surface. The nozzle body may thus be lifted by pressing down on the handle and may be shifted by moving the vacuum cleaner either forwardly or backwardly.

Various changes and modifications may be made within the scope of the invention. Certain specific embodiments have been shown by way of example only. The small suction opening of Figs. 1 through 5 may, for example, be placed in the center of the nozzle body as shown in Figs. 6 to 8. Various other changes will also appear to a person skilled in the art. The invention is only to be limited in accordance with the following claims when interpreted in view of the prior art.

What I claim is:

1. A vacuum cleaner nozzle comprising an apertured suction head and a nozzle body having a plurality of dissimilar suction mouths, means for connecting said nozzle body to said suction head for pivotal movement of said body about an axis transverse to its normal direction of movement in cleaning, said suction mouths being spaced angularly about said axis, and said nozzle body being pivotal for selectively positioning said suction mouths adjacent to a surface to be cleaned and in communication with said apertured suction head.

2. A vacuum cleaner nozzle comprising an elongated suction head and a nozzle body mounted for rotation thereon and having large and small suction openings spaced angularly about the axis of rotation, said body being pivotal for selectively positioning said suction openings adjacent to a surface to be cleaned and in communication with said apertured suction head, said suction head contacting said surfaces when said large suction opening is adjacent to the surface and forming one side wall of said large suction opening.

3. A vacuum cleaner nozzle comprising a suction head and a nozzle body having a plurality of dissimilar suction openings mounted for pivotal movement on said suction head about an axis transverse to its normal direction of movement in cleaning, said suction openings being spaced angularly about said axis, and said nozzle body being pivotal for selectively positioning said openings adjacent to a surface to be cleaned, said nozzle body having a cylindrical portion adjacent to said suction head, said cylindrical portion having a transverse passage connecting said opening to said suction head.

4. A vacuum cleaner nozzle comprising a suction head and a nozzle body having a cylindrical part pivotally connected to said suction head, said cylindrical part having a transverse passage forming a small suction opening at one end of said passage and a wall extending from said cylindrical part to form in conjunction with said

cylindrical part and with the opposite end of said passage a large suction opening which communicates through said transverse passage with said suction head, said nozzle body being rotatable about an axis transverse to its normal direction of movement in cleaning for selectively positioning said openings for use.

5. A vacuum cleaner nozzle comprising an apertured suction head and a nozzle body having a plurality of dissimilar suction openings, said nozzle body being mounted on said suction head for pivotal movement about an axis transverse to its normal direction of movement in cleaning, said suction openings being spaced angularly about said axis, and said nozzle body being pivotal for selectively positioning said suction openings adjacent to a surface to be cleaned and in communication with said apertured suction head, said nozzle body having raised flanges located adjacent to one of said openings for forming runners extending parallel to said direction of movement to space said one of said openings from said surface so as to provide a passage for the suction air.

6. A vacuum cleaner nozzle comprising an apertured suction head and a nozzle body having a plurality of dissimilar suction openings, said nozzle body being mounted on said suction head for pivotal movement about an axis transverse to its normal direction of movement in cleaning, said suction openings being spaced angularly about said axis, and said nozzle body being pivotal for selectively positioning said suction openings adjacent to a surface to be cleaned and in communication with said apertured suction head, said nozzle body having raised flanges located adjacent to one of said openings for forming runners extending parallel to said direction of movement to space said one of said openings from said surface to provide a passage for the suction air, said flanges being arcuate and having frictional portions normally spaced above said surface to engage said surface upon slight tilting of said body for shifting the suction openings.

7. A vacuum cleaner nozzle comprising an apertured suction head and a nozzle body having a plurality of dissimilar suction openings, said nozzle body being mounted on said suction head for pivotal movement about an axis transverse to its normal direction of movement in cleaning, said suction openings being spaced angularly about said axis, and said nozzle body being pivotal for selectively positioning said suction openings adjacent to a surface to be cleaned and in communication with said apertured suction head, said pivotal mounting having spring means to permit relative displacement of said nozzle body and said suction head to provide clearance for particles which may become lodged between the surfaces thereof.

FREDRIK JOHAN ROBERT KARLSTRÖM.