

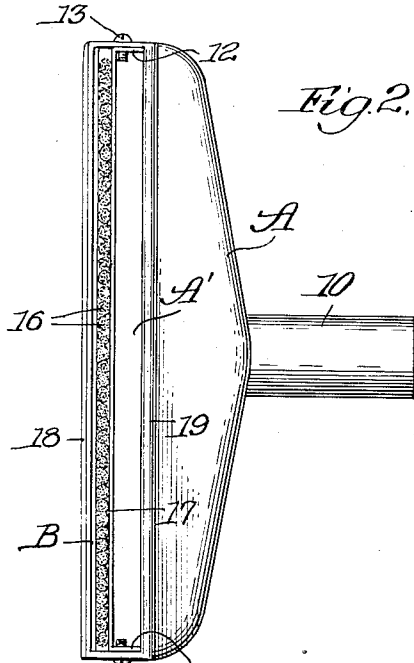
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SUCTION NOZZLE

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SUCTION NOZZLE

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6 Claims. (Cl. 15-158)

This invention relates to a suction nozzle for a suction cleaner or similar devices.

An object of the invention is to provide a suction nozzle which is provided with means for readily picking up threads and other objects which the ordinary type of nozzle cannot pick up or can pick up only with great difficulty. A further object is to provide a nozzle in which the intake slot is diminished in size when the nozzle is moved in one direction. A further object is to provide a nozzle with brush and valve means by which strings, thread, etc. are carried by the brush to a diminished intake opening, where increased suction carries the threads, etc. into the nozzle. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawing, in which—

Figure 1 is a top plan view of a nozzle embodying my invention; Fig. 2, a bottom plan view showing the intake slot in fully opened position; Fig. 3, a bottom plan view showing the intake slot partly closed; Fig. 4, a detail sectional view showing the intake slot partially closed, the section being taken as indicated at line 4-4 of Fig. 1; Fig. 5, a view similar to Fig. 4, but showing the intake slot in full-open position; and Fig. 6, a sectional view of a modified form of nozzle.

In the illustration given, A designates a nozzle housing providing on its lower side an intake opening A'; and B, a rotatable member mounted adjacent opening A' and partially controlling said opening.

The nozzle of housing A may be of any suitable construction. In the illustration given, the housing is provided with an integral rearwardly extending pipe 10, which may be secured to a hose from the vacuum cleaner or to a pipe which is attached to the hose from the vacuum cleaner. If desired, the housing A may be constructed as a part of a direct suction cleaner of the pusher type.

The rotatable member B is shown formed of a U-shaped metal strip 11 having the ends thereof turned to form flanges 12. A pair of screw pins 13 extend through the end flanges 12 and serve as pivots upon which the member B may rock. Preferably, the end flanges are extended to provide locking or stop abutments 14, as illustrated more clearly in Figs. 4 and 5.

Secured to the rocking member 11 is a nap-engaging member or comb which may be of any suitable construction. Within the U-bend of the metal member 11 is clamped a strip 15 of wood

or other suitable material in which is secured a row of brushes 16. The inner side of the U-shaped strip 11 is preferably extended to form a lip 17 which serves as a backing or buttress for the brushes 16, while at the same time controlling the size of the intake opening through which air and foreign matter enter the nozzle.

With the rotatable member B in the position adjacent the casing opening A', it will be observed that the forward edge portion of member B engages the adjacent wall 18 of casing A so as to substantially seal the forward portion of opening A'. Between the lip 17 and the rolled edge portion 19 of casing A, to the rear of opening A', is a slot 20 which serves as the intake slot for the nozzle. As shown more clearly in Figs. 2, 3, 4 and 5, the intake slot 20 is rendered wider and narrower by the operation of the rocking member B. As shown more clearly in Figs. 2 and 5, the slot 20 is relatively wide because the lip 17 is almost in a vertical plane, while in Figs. 3 and 4, the slot 20 is relatively narrow because the lip 17 is approaching a horizontal plane.

In the latter position of the rocker member B, the lower rounded side 21 of the U-shaped member 11 serves as a bearing upon which the forward part of the nozzle rests.

In the operation of the device, when the nozzle is drawn rearwardly across the rug, the member B rocks to the position shown in Figs. 2 and 5, the brushes 16 being drawn to the substantially vertical position shown in these figures. The engagement of the stop portion 14 of flanges 17 with the portion 19 of casing A prevents further rotation of member B. The brushes 16 are thus held in a position in which they are effective for gathering threads and other objects ordinarily difficult to pick up with a suction cleaner. As the nozzle is moved forward again, the member B automatically rocks to the position shown in Figs. 3 and 4, and it will be observed that the brushes are brought almost to a horizontal position, and with their end portions directly at the entrance of the narrowed intake slot 20. In this manner, the threads and other objects are placed in a trailing position in which they may easily slip off the brushes 16, while the increased suction resulting from the narrowing of the intake aperture leads to the ready removal of the threads, lint, etc. Thus the forward and rearward strokes of the nozzle result in a constant rocking of member B and a constant widening and narrowing of the intake slot 20.

As already pointed out, the action of the brushes cooperates with the narrowing of the

intake slot to remove lint, etc.; however, the nozzle is still an efficient device without such brushes in that the changing of the size of the intake slot with the resultant increasing and decreasing of the suction, serves to effectively clean rugs and to take up dust, lint, strings, etc. The rearward movement of the nozzle with the resultant wide opening of slot 20 serves to draw in large volume the loose dust, etc. on the rug. When the nozzle is then moved forward over the same area, the narrowed intake slot with its increased suction serves to dislodge and remove string and objects difficult to remove, and this may be accomplished without the aid of brushes. I prefer, however, to employ brushes or the equivalent as illustrated.

In the modified form of the invention illustrated in Fig. 6, a strip 22 of wood or other suitable material carries brushes 23. Secured to the strip 22 is a curved metal plate 24 provided with end flanges 25 carried by pivots 26 secured to the casing.

The top wall 27 of the casing is provided near its forward end with an inwardly turned shoulder 28 adapted to be engaged by one end of member 24 to limit the movement thereof. Movement of the tiltable device in the opposite direction is limited by the engagement of member 22 with the shoulder 29 of the upper casing.

In the modified construction shown in Fig. 6, the device rocks upon pivot 26 and is limited in its rocking movement by the engagement of member 24 with shoulder 28 and the engagement of member 22 with shoulder 29.

In the operation of the device shown in Fig. 6, if dust, lint, etc. should accumulate behind the member 26 and adjacent shoulder 29, this material will be drawn into the nozzle when the metal member 24 is moved away from shoulder 28. It will thus be seen that the action of the rotatable member brings about a self-cleaning of the nozzle and its operating parts.

While in the foregoing illustrations, I have shown a mechanism which is operated automatically by the contact of the rotatable member with a surface upon which the nozzle is moved, it will be understood that other means for effecting movement of the rotatable or tilting member can be brought about by the engagement of other parts with the surface upon which the nozzle is moved, without departing from the spirit of my invention.

While I have shown the nozzle of a certain specific type, it will be understood that the invention is applicable to many types of nozzles and nozzles employing the invention may be formed as a part of direct suction devices, machines, etc.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. A suction nozzle comprising a housing affording an intake opening, a pivoted valve mem-

ber carried by said housing and provided with a lip controlling the size of said opening, means actuated by the movement of the nozzle over a surface for rotating said valve, and stop means for limiting the extent of rotation of said valve.

2. A suction nozzle comprising a housing having an intake opening, and air-impervious means movable into alternate positions in said opening for varying the size of said opening and so formed as to provide at all times a free passage for air adjacent one edge of said opening, the movement of said means being automatically accomplished by a reversal in the direction of travel of the nozzle upon a surface being cleaned, said means being effective to automatically reduce the size of said opening upon movement of said nozzle in one direction and to increase the size of said opening upon movement of said nozzle in another direction.

3. A suction cleaner nozzle comprising a housing having a suction opening, and imperforate means for automatically varying the suction at said opening only upon a reversal of movement of the nozzle upon a surface being cleaned, said means cooperating with said suction opening and so formed as to provide at all times a free passage for air adjacent one edge of said opening.

4. A suction cleaner nozzle comprising a housing having a suction opening, movable means for varying the size of said suction opening, the operation of said means being dependent upon the relative movement of the nozzle with respect to the surface being cleaned as said nozzle is moved in contact with said surface, said means being equipped with laterally projecting members for limiting its movement, said laterally projecting members being equipped with pivots whereby said means is mounted in said housing.

5. In a nozzle of the character set forth, a housing affording an intake opening, a rocker member pivotally mounted in the central portion of said housing and equipped with a brush, said rocker member being actuated by the movement of the nozzle over a surface, stop means on said rocker member for maintaining said brush in a trailing position when said nozzle is moved over a surface in one direction, said stop means also being adapted to engage said housing to prevent flow of air on one side of said rocker member as the nozzle is being moved over a surface in one direction and to disengage said housing to permit flow of air when the movement of said nozzle is reversed.

6. In a nozzle of the character set forth, a housing affording an intake opening, a rocker member pivotally mounted in said housing, means for rotating said rocker member to a first position as the nozzle is moved over a surface in one direction and to a second position as the nozzle is moved in a reversed direction, and means for preventing the passage of air on one side of said rocker member when said rocker member is in either said first or second positions, said means being adapted to permit the passage of air when said rocker member is being rotated.

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