Oct. 9, 1951 G. H. BRAMHALL 2,570,759

VACUUM CLEANER NOZZLE WITH RETRACTABLE FLOATING BRUSH

Filed March 28, 1950

Fig. 7.

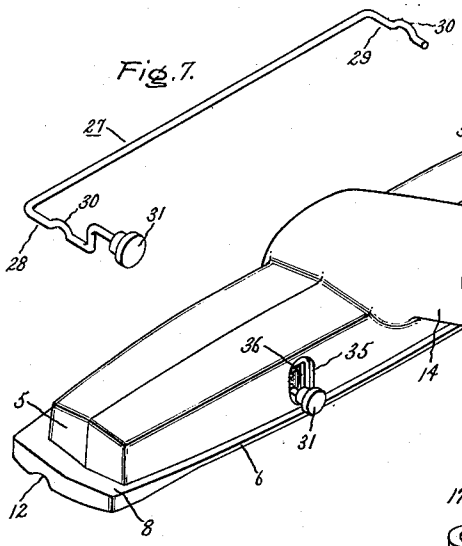


Fig. 1.

Fig. 6.

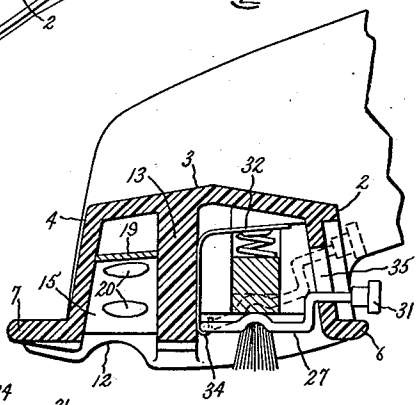


Fig. 2.

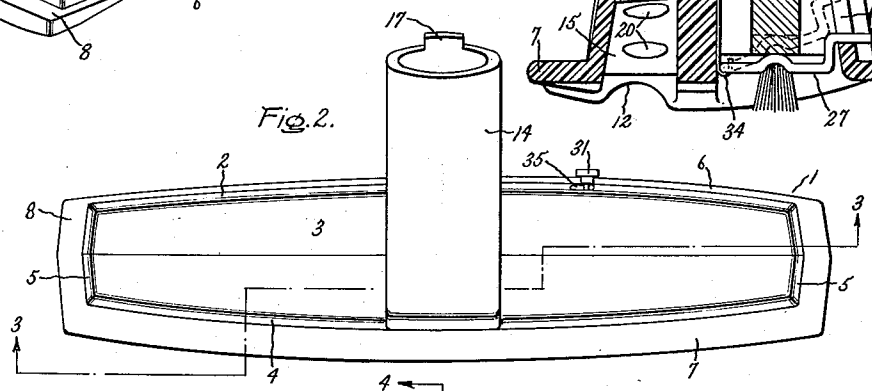


Fig. 3.

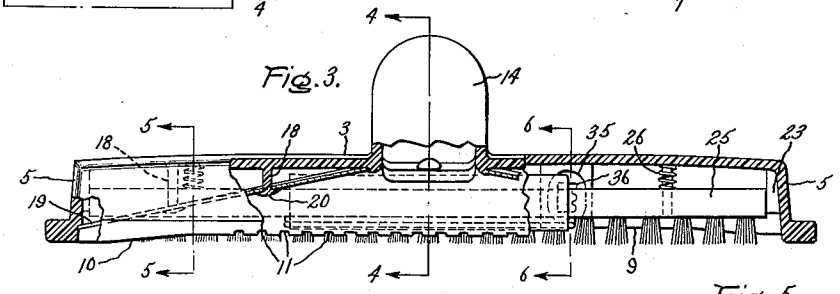


Fig. 5.

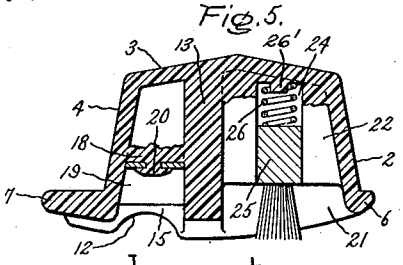
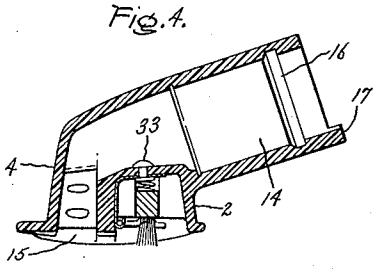


Fig. 4.



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VACUUM CLEANER NOZZLE WITH RETRACTABLE FLOATING BRUSH

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3 Claims. (Cl. 15—371)

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My invention relates to a nozzle for a vacuum cleaner. More particularly my invention relates to a nozzle of the type commonly used at the end of a suction tube for cleaning rugs.

The object of my invention is to provide a rug nozzle which is inexpensive, light in weight, and effective in picking up litter such as cotton, threads, lint, hairs etc. in addition to dirt which is in a rug. For this reason my invention contemplates the use of a brush mounted in the nozzle which will disturb or pick up the lint or other debris. This brush is retractably mounted so that its position above the rug or other floor surface being cleaned may be adjusted. Additionally, the brush is mounted on springs so that it will yield when it comes into contact with the floor.

The objects of my invention are met by making the nozzle of hollow form, providing light sheet metal strips to serve as the interior suction passage walls, using a brush of conventional design in the nozzle mounted on springs which press the brush outwardly toward a pivoted formed wire supporting member which has one leg adjustably seated through a wall of the nozzle and which is held in its pivot seat in the nozzle by the springs.

Other objects and the details of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawing in which is illustrated an example of vacuum cleaner rug nozzle embodying the present invention and incorporating the hollowed-out nozzle head with the retractable brush.

In the drawing Fig. 1 is a perspective view of a nozzle according to my invention showing the rear and top sides of the nozzle; Fig. 2 is a plan view of the nozzle of Fig. 1; Fig. 3 is a vertical, sectional view taken generally on the line and in the direction of the arrows 3—3 of Fig. 2; Fig. 4 is a vertical section through the nozzle on the line and in the direction of the arrows 4—4 of Fig. 3; Fig. 5 is a vertical section view on a larger scale, through the nozzle on the line and in the direction of the arrows 5—5 of Fig. 3; Fig. 6 is a vertical section on the same scale as Fig. 5, through the nozzle on the line and in the direction of the arrows 6—6 of Fig. 3, and Fig. 7 is a perspective view of the brush adjusting member removed from the nozzle.

The main nozzle body 1 is made of a suitable plastic material, which may be one of the thermoplastic or thermosetting resins. The nozzle body is provided with a rear wall 2, a top wall 3, a front wall 4, and end walls 5. Rug sealing flanges or edges 6 and 7 are provided at the bottom of the rear and front walls respectively. These rug sealing edges may be continued around the ends of the nozzle as shown at 8. The rug sealing edges may be cut away as at 9 in the rear wall and as at 10 in the front wall and may additionally be notched as shown at 11. The rug sealing edge on the end walls may also be cut away as at 12 to permit flow of air through the ends of the nozzle.

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Extending lengthwise of the nozzle, about midway between the front and rear walls, is a central support or partition 13. The bottom edge of this partition may also be cut away and notched as are the front and rear wall edges of the nozzle.

Extending rearwardly from the central portion of the top wall of the nozzle is a hose coupling tube 14 which communicates with the space 15 between the front nozzle wall and the central partition (see Fig. 4). The tube 14 is adapted to be connected to a flexible hose or rigid tube extending from a usual vacuum cleaner, and I have shown an annular interior groove 16 and a lip 17 for that purpose. Other connection details for attaching the nozzle tube to the vacuum cleaner hose could be employed in a manner which is obvious.

Inside of the nozzle between the outer front wall and the central partition I have provided stiffening ribs 18 which serve the additional function of supporting strips 19 of thin metal. The strips 19 are so located as to serve as the upper interior wall of the nozzle on either side of the tube 14 between the front wall and the central partition. These strips 19 are held in place in the nozzle by small lugs integral with the reinforcing ribs 18. These lugs pass through holes in the metal strips, and after the strips are in place, the lugs are deformed to form heads 20 which hold the strips in place as shown in Figs. 5 and 3. In the space 21 between the partition wall and the rear wall of the nozzle, I provide other stiffening ribs 22 which correspond generally to the ribs 18. At the ends of this space 21 are brush guiding shoulders 23. These shoulders 23, together with notches 24 in the ribs 22, serve to position and guide the brush 25 in limited movement within the space 21 generally parallel to the partition wall.

The brush 25 is composed of a back piece or dowel strip usually made of wood and a series of tufts of bristles secured to the dowel in any suitable fashion. Preferably the bristle tufts

are spaced apart from each other at slight intervals for reasons which will appear later.

The brush 25 is urged outwardly from the nozzle toward a rug being cleaned by the nozzle by means of helical springs 26 which are seated at their top ends around bosses 26' in the bottom of the notches 24 of the ribs 22 and at their bottom ends bear against the back of the brush dowel. The brush dowel is prevented from being forced out of the nozzle by the provision of the formed wire brush supporting and adjusting member 27. As shown in Fig. 7 this wire member is of generally U-shape, the bight or nexus of the U serving as a pivot and the legs or arms of the U extending under the brush dowel to support the brush. One of the legs 28 of the member 27 is elongated and extends through the rear wall of the nozzle, while the other leg 29 is terminated short of the rear wall and is therefore located entirely within the space 21 between the partition wall and the rear wall. Both of the legs are provided with arcuately deformed portions 30 which bear against the underside of the brush between bristle tufts. An actuating knob 31 of any suitable form is provided on the end of the arm 28 for manipulation of the formed wire brush supporting and adjusting member.

As mentioned above, the brush supporting member is pivoted inside the nozzle. This pivot preferably is provided by a generally L-shaped sheet metal member 32 which is secured within the space 21 in any suitable fashion. I have shown it as being secured within the nozzle by rivets 33 (see Fig. 4) but it is obvious that it might be secured in much the same manner as are the strips 19.

The vertical leg of the supporting pivot member 32 lies closely adjacent the partition wall and is provided at its lower end with a semi-circular hook 34. The springs 26 urge the brush against the supporting member 27 and therefore urge the bight of this member into the hook 34, the open side of which faces upwardly.

The L-shaped sheet metal pivot support is made of a length substantially equal to the length of the bight or nexus of the supporting member 27. Therefore when the member 27 is seated in its support it cannot shift endwise.

For adjusting the brush between various positions relative to the floor, I have provided a slot 35 in the rear wall of the nozzle, and the arm 28 of the brush supporting member passes through this slot. One edge of this slot is notched as at 36 (see Figs. 1 and 3) and the arm 28 may be snapped from one notch to another in the slot in order to adjust the brush for different positions. The inherent resiliency of the wire from which the member 27 is formed will urge the arm 28 of this member toward the notched side of the slot 35, thereby holding the brush supporting member in adjusted position.

When the nozzle is used it is connected in the ordinary fashion to a suction hose or tube of a vacuum cleaner. The bottom of the nozzle is placed or pressed against a rug or similar surface to be cleaned and the rug sealing edges come in contact with the rug in the usual fashion. Suction through the tube 14 and in the space 15 below the strips 19 will tend to pull the rug toward the bottom edges of the front, rear, central partition and end walls of the nozzle. The brush will be urged toward the rug because of the pressure of springs 26, but the brush is free to move upwardly if pressure on the bristles is sufficient to overcome the pressure of the springs 26. This is desirable for ease in operation of the nozzle. On the other hand, the distance that the brush initially extends below the nozzle rug sealing edges may be governed by the position of the brush supporting and adjusting member. By means of this adjustment a "heavy" or "light" brush pressure may be used, to accommodate the length or weight of the rug nap or the amount of clinging litter which is on the rug.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the example illustrated, and I contemplate that various and other modifications and applications of the invention will occur to those skilled in the art. It is therefore my intention that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a suction nozzle for a vacuum cleaner of the type having a hollow elongated body open at the bottom and with a suction tube communicating with the hollow body, that improvement which comprises a central, lengthwise extending partition in the body, an upwardly facing hook on said partition, an elongated brush in said body extending generally parallel to said partition adjacent said hook, springs between said body and said brush urging the brush downwardly toward said open bottom, a U-shaped brush supporting member with a bight pivotally seated in said hook and arms extending away from said partition under said brush, said support arms, by their pivotal position relative to said support bight, limiting the distance that said springs may urge said brush toward said open bottom and means for adjusting the position of said arms relative to the pivot seat of the supporting member to vary the position of the brush.

2. In a suction nozzle for a vacuum cleaner of the type having a hollow elongated body open at the bottom and with a suction tube communicating with the hollow body, that improvement which comprises a central, lengthwise extending partion in the body, an upwardly facing hook on said partition, an elongated brush extending generally parallel to said partition adjacent said hook and slidably mounted for up and down movement in said body, compression springs between said body and said brush urging the brush downwardly toward said open bottom, a U-shaped wire brush supporting member with a bight pivotally seated in said hook and arms extending away from said partition under said brush, said support arms, by their pivotal position relative to said support bight, limiting the distance that said springs may urge said brush toward said open bottom, one of said arms being longer than the other and extending outwardly of the nozzle body, and means adjustably positioning said extended arm with relation to the pivot seat of the supporting member, whereby the position of the brush may be varied.

3. In a suction nozzle for a vacuum cleaner of the type having a hollow elongated body open at the bottom and with a suction tube communicating with the hollow body, that improvement which comprises a central, lengthwise extending partition in the body, an upwardly facing open hook on said partition, an elongated brush extending generally parallel to said parti-

tion adjacent said hook and slidably mounted for up and down movement in said body, a U-shaped resilient wire brush supporting member with a bight pivotally seated in said hook and arms extending away from said partition under said brush, compression springs between said body and said brush urging the brush downwardly toward the arms of said supporting member and toward said open bottom, said support arms, by their pivotal position relative to said support bight, limiting the distance that said springs may urge said brush toward said open bottom, one of said arms being longer than the other and extending outwardly of the nozzle body through a slot in the body, said slot having notches in one edge thereof against which said

extended arm resiliently presses, whereby the position of said arms relative to the pivot seat of the supporting member may be selected to vary the position of the brush.

GEORGE H. BRAMHALL.

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