

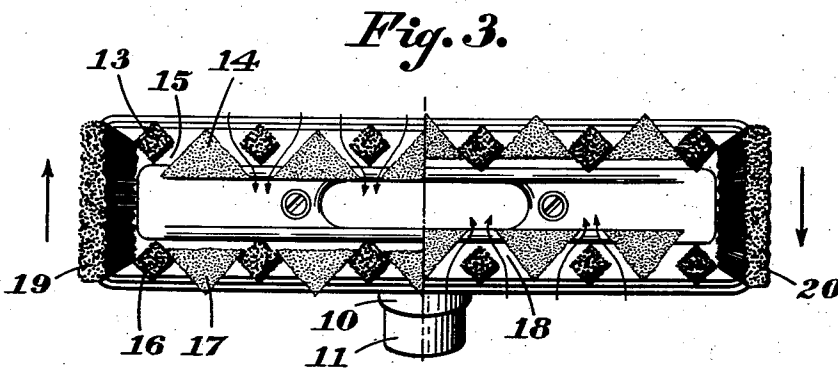
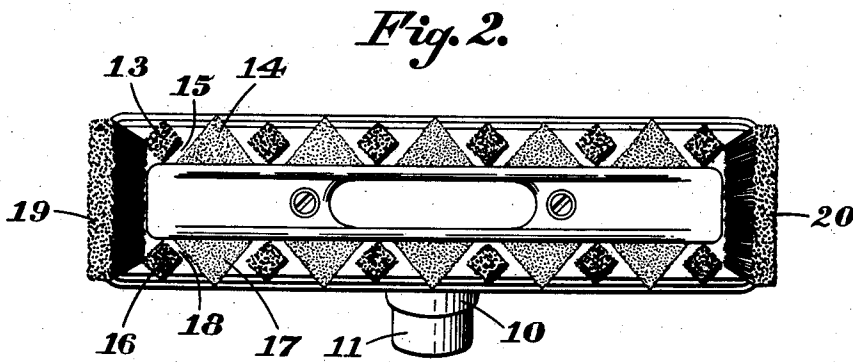
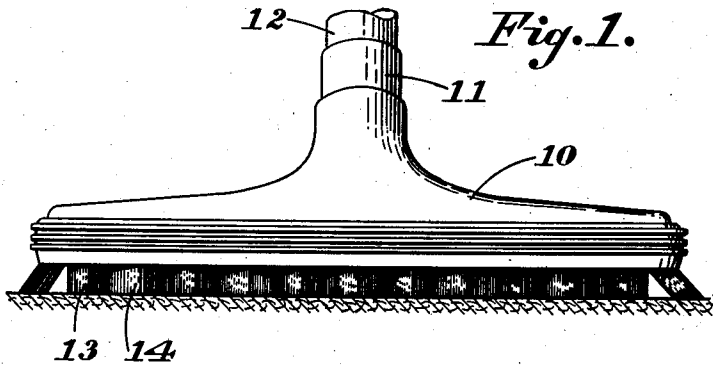
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NOZZLE FOR VACUUM CLEANERS

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NOZZLE FOR VACUUM CLEANERS

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This invention relates to nozzles for vacuum cleaners, and more particularly to nozzles provided with depending brushes.

An object of my invention is to provide an improved suction nozzle having a depending brush with relatively movable brush sections producing openings between the brush sections along the forward edge upon forward movement of the nozzle, which openings will be closed upon rearward movement.

Another object of my invention is to provide an improved nozzle which will clean with equal facility upon either a forward movement or upon a reverse movement of the nozzle.

In accordance with my invention, a plurality of brush sections are secured to the forward and rear edges of the nozzle which provide openings between the adjoining sections along the forward edge upon forward movement of the nozzle, and also provide openings along the rear edge upon rearward movement of the nozzle.

What I consider to be novel and my invention may be better understood by reference to the following specification and appended claims, when considered in conjunction with the accompanying drawing, in which

Fig. 1 is a front elevation of my improved nozzle;

Fig. 2 is a bottom view of the nozzle; and

Fig. 3 is a composite bottom view of the nozzle, showing the relative positions of the brush sections upon forward and reverse movement.

Referring to the drawing, 10 indicates a nozzle body connected to a source of suction (not shown) by means of an elbow 11 connected to a suction conduit 12. Depending from the forward edge, as determined by the normal direction of movement of the nozzle body, are a plurality of brush sections 13, of square cross sections, and brush sections 14 of triangular cross sections, interspersed between the adjoining brush sections 13. The brush sections 14 are positioned with the apices of the triangles extending forwardly in the direction of the normal movement of the nozzle body 10 or outwardly of the nozzle mouth. Between the adjoining brush sections 13 and 14, an inclined passage 15 is provided. Depending from the rear edge are a plurality of brush sections 16 of square cross sections and brush sections 17 of triangular cross sections. The brush sections 17 of triangular cross sections are similarly interspersed between the adjoining square brush sections 16 with the apices of the triangles extending rearwardly from the direction of normal movement of the nozzle body 10 or outwardly of the nozzle mouth. Between the adjacent brush sections 16 and 17, inclined passages 18 are provided. The brush sections 14 and 17 are formed of more flexible bristles than the brush sections 13 and 16. Thus, the brush sec-

tions 14 and 17 will flex more freely due to frictional contact with the surface being cleaned than the brush sections 13 and 16. As indicated in Fig. 3, to the left of the center line of the nozzle body 10, the brush sections 14 will move rearwardly as the nozzle is moved forward in the direction indicated by the arrow in the left and the brush sections 17 will likewise move rearwardly. The movement of the brush sections 14 rearwardly will enlarge the passages 15 between the adjacent brush sections 13 and 14. The suction communicated through the suction conduit 12 and elbow 11 to the nozzle mouth will produce a flow of air between the adjacent brush sections 13 and 14 in the direction indicated by the arrows to the left of the center line in Fig. 3. The flow of air through the passages 15 will carry with it dirt and dust located on the surface being cleaned. The brush sections 17 along the rear edge of the nozzle body 10 moving in a rearward direction will close the passages 18 between the adjacent brush sections 16 and 17. This prevents the dust and dirt carried by the air through the passages 15 from passing beneath the nozzle body 10 as it is moved forwardly. In a similar manner, when the nozzle body 10 is moved rearwardly in the direction indicated by the arrow on the right of Fig. 3, the brush sections 14 will be moved forwardly, closing the passages 15 between the adjacent brush sections 13 and 14, and the brush sections 17, also moving forwardly, will open wider the passages 18 between the adjacent brush sections 16 and 17. Thus in a rearward movement of the nozzle body 10, air will be drawn in by the suction communicated to the nozzle mouth in the direction indicated by the arrows to the right of the center line of Fig. 3. The air passing through the passages 18 will draw with it dust and dirt located on the surface being cleaned in a manner as described for the forward movement of the nozzle body 10. In this case, the passages 15, being closed, will prevent the escape of this dust and dirt as the nozzle body 10 is moved rearwardly. By the arrangement of relatively flexible and inflexible adjoining sections on the front and rearward edge of the nozzle body, the cleaning of a surface is facilitated independently of the direction of movement of the nozzle body 10.

Secured along the two ends of the nozzle body 10 and depending at an angle therefrom are brush sections 19 and 20, which are formed in a substantially compact manner to prevent an undue reduction in the suction available for lifting the dirt and causing it to pass between the passages in the front or rear of the nozzle, depending upon the direction of movement of the nozzle. Due to the outward inclination of the brush sections 19 and 20, the cleaning of a surface adjoining furniture will be facilitated with-

out the danger of damage to the furniture. Instead of forming the brush sections 14 and 17 of relatively flexible bristles, as compared with the brush sections 13 and 16, respectively, it may be found desirable to use bristles of the same flexibility but obtain the movement by making the length of the bristles of brush sections 14 and 17 greater than the length of the bristles of brush sections 13 and 16. The greater length of the bristles will increase the frictional contact with the surface being cleaned and so produce the desired relative movement between the brush sections 13 and 14 and brush sections 16 and 17.

The operation of my improved nozzle may be described as follows:

The nozzle body 10 is connected to a source of suction by means of conduit 12 and elbow 11. The suction is communicated to the nozzle mouth through an opening 21. As the nozzle is moved back and forth over a surface being cleaned, the brush sections tend to agitate or disturb the dirt located on the surface contacted thereby. On the forward stroke of the nozzle the relative movement between the brush sections 13 and 14 permit a flow of air through the passages 15 into the nozzle mouth. The dirt and dust carried by the air entering the passages 15 is prevented from passing beneath the nozzle mouth as the nozzle is moved forward by the brush sections 16 and 17, which present a relatively closed surface, due to the movement of brush sections 17 into contact with the brush sections 16. This movement closes the normal passages 18. Spaced brush sections along the front edge of the nozzle have been used heretofore to permit the ready entrance of the dirt and dust into the region of the nozzle mouth upon forward movement of the nozzle. This has been accomplished by relatively immovable brush sections spaced along the front edge of the nozzle. However, such a construction does not permit an efficient cleaning upon rearward movement of the nozzle. In my construction this is accomplished by the reverse movement of the brush sections 14 and 17, respectively, upon the back stroke of the nozzle. As the nozzle 10 is moved rearwardly with the brush sections in contact with a surface being cleaned, the brush sections 17 open the passages 18. The movement of the brush sections 14 closes the normally open passages 15. This permits the air entering through the passages 18 to carry with it dirt and dust disturbed by contact between the brush sections and the surface being cleaned. Passage by the nozzle of the dirt and dust entering in the region of the mouth of the nozzle is prevented by the closing of the passages 15. Dirt and dust is carried into the region of the mouth of the nozzle either through the passages 15 on the forward movement of the nozzle or through the passages 18 on the rearward movement of the nozzle. Dust and dirt are carried into the vacuum cleaner through the suction conduit 12 and elbow 11. The closing of the passages 18 upon the forward movement of the nozzle or the passages 15 upon rearward movement of the nozzle together with the brush sections 19 and 20 perform the additional function of maintaining a relatively high suction for the lifting of the dirt and dust by the suction after it has entered into the region of the nozzle mouth. Obviously, if these passages were permitted to remain open they would not

only permit, at least some of the dirt and dust, to pass beneath the nozzle but they would also reduce the suction available for lifting the dirt and dust and carrying it away from the surface being cleaned.

Other forms of the relatively movable and immovable brush sections may be used than those shown for the purpose of illustrating the invention. It is to be understood that the invention is not limited to the specific form of these brush sections, but it is only limited to the extent pointed out in the appended claims.

What I claim is:

1. A nozzle for vacuum cleaners comprising a nozzle body having a suction opening, a plurality of brush sections depending from the front edge of the nozzle body in spaced relation, a plurality of brush sections depending from the front edge of the nozzle body between said first-named brush sections overlapping adjacent sections of said first-named brush sections in a direction of normal movement of said nozzle and forming passages therebetween communicating with said suction opening, said first-named and second-named brush sections differing in flexibility, whereby movement of said nozzle body in one direction in contact with a surface being cleaned causes relative movement between said brush sections to close said passages, and brush sections depending from the rear edge and ends of said nozzle body.

2. A nozzle for vacuum cleaners comprising a nozzle body having a suction opening, brush sections of square cross-section secured in spaced relation along the forward edge of the nozzle body with a diagonal of each square substantially parallel to the direction of movement of the nozzle, brush sections of triangular cross-section secured between said first-named brush sections with the apices of the triangles extending forward closely adjacent said first-named brush sections and forming passages communicating with said suction opening, said last-named brush sections being more flexible than said first-named brush sections and adapted to move relative thereto upon movement of said nozzle rearwardly with said brush sections in contact with the surface being cleaned to close said passages, and brush sections secured along the rear edge and two ends of said nozzle body.

3. A nozzle for vacuum cleaners comprising a nozzle body having a mouth forming a suction opening, brush sections of square cross-section secured in spaced relation along the forward and rear edges of said nozzle body with a diagonal of each square substantially parallel to the direction of movement of the nozzle, brush sections of triangular cross-section secured along the forward and rear edges of said nozzle body between and closely adjacent to said first-named brush sections forming passages communicating with said suction opening and having the apices extending outwardly from the mouth of the nozzle body, said last-named brush sections differing in flexibility from and adapted to move relative to said brush sections in contact with a surface being cleaned to close the passages along the rear edge upon forward movement and to close the passages along the forward edge upon rearward movement, and brush sections secured along the two ends of said nozzle body.

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