

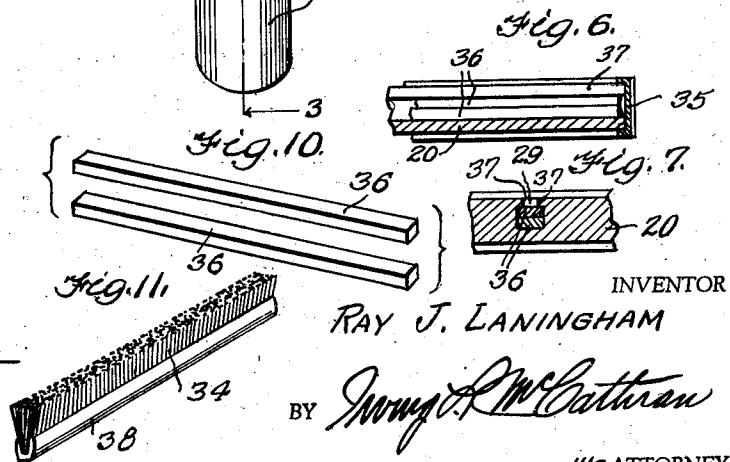
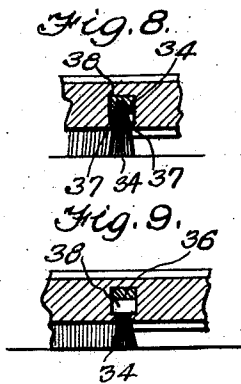
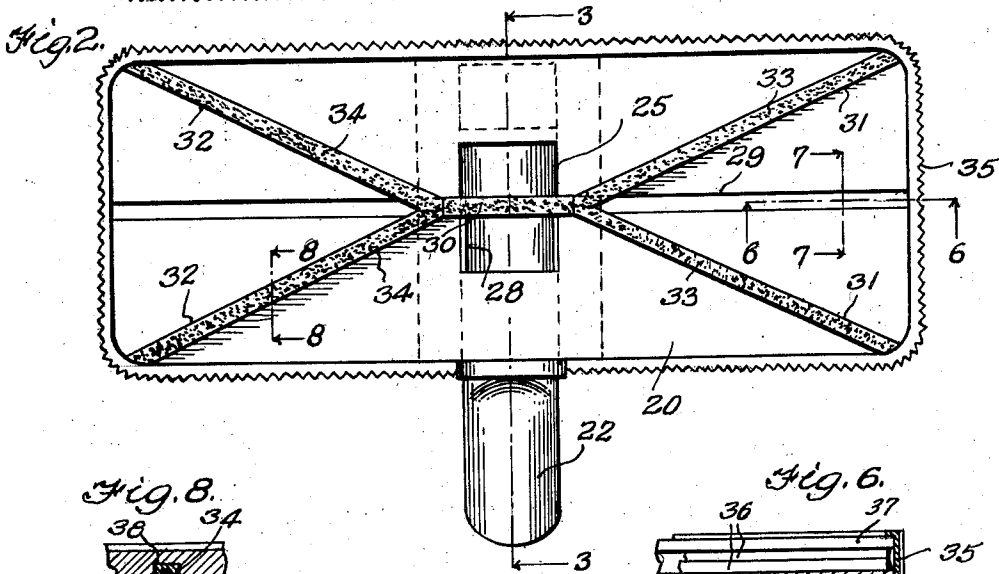
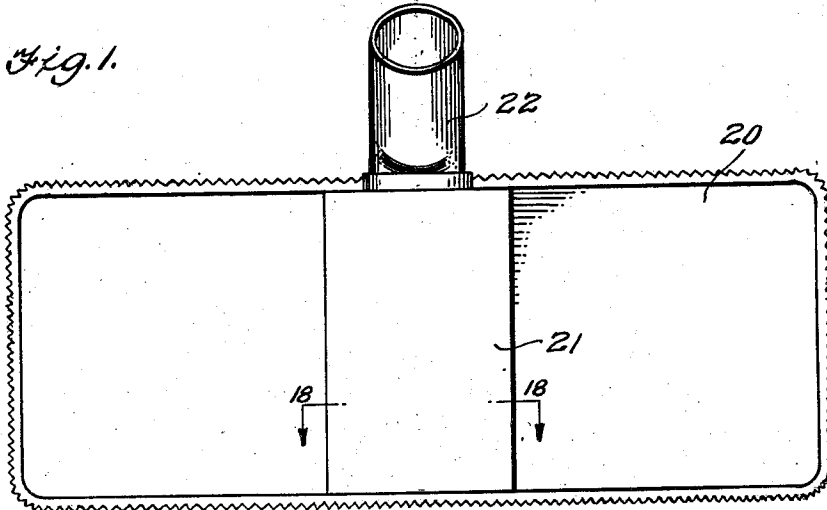
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R. J. LANINGHAM
VACUUM CLEANER BRUSH HEAD

2,824,334

Filed Sept. 13, 1954

2 Sheets-Sheet 1



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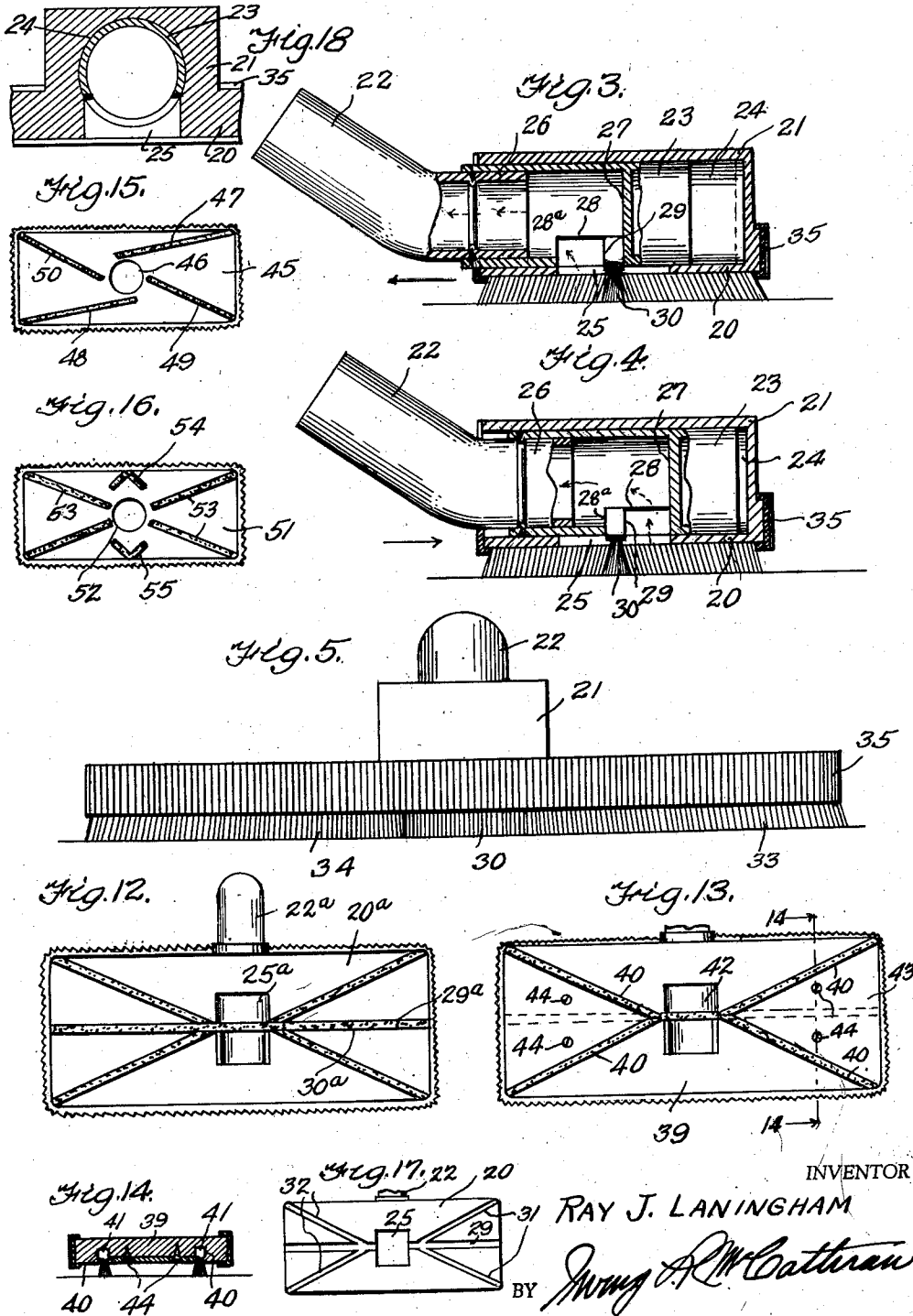
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VACUUM CLEANER BRUSH HEAD

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5 Claims. (Cl. 15—325)

This invention relates to a vacuum cleaner brush head, and has for one of its objects the production of a simple and efficient brush which is adapted to be used in connection with a wand-type cleaner, wherein the brush head is provided with a plurality of removable brush elements which are mounted so as to converge toward the suction opening of the brush head to facilitate the direction of dust and the like toward the suction opening of the brush head.

A further object of the invention is the production of a vacuum cleaner brush head, wherein the vacuum hose connecting elbow of the brush head is longitudinally shiftable transversely of the head and is provided with a suction opening which is automatically and alternately opened upon opposite sides of the brush elements of the brush head as the brush head is alternately moved forwardly and backwardly.

Other objects and advantages of this invention will appear throughout the following specification and claims.

In the drawings:

Figure 1 is a top plan view of the brush head;

Figure 2 is a bottom plan view thereof;

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 2, showing the valve element open rearwardly of the central brush;

Figure 4 is a transverse sectional view similar to Figure 3, showing the valve element open forwardly of the central brush;

Figure 5 is a front elevational view of the brush head;

Figure 6 is a fragmentary longitudinal sectional view taken on line 6—6 of Figure 2;

Figure 7 is a fragmentary transverse sectional view taken on line 7—7 of Figure 2;

Figure 8 is a fragmentary transverse sectional view taken on line 8—8 of Figure 2;

Figure 9 is a fragmentary transverse sectional view similar to Figure 8, showing the brush element extended by the insertion of a filler strip in the brush element receiving channel of the brush head;

Figure 10 is a group perspective view of the filler strips used in connection with the present invention;

Figure 11 is a perspective view of one of the brush elements;

Figure 12 is a bottom plan view of the brush head with a central longitudinal brush element extending for the full length of the brush head;

Figure 13 is a bottom plan view of a modified form of brush head;

Figure 14 is a transverse sectional view taken on line 14—14 of Figure 13;

Figure 15 is a bottom plan view of a further modified form of the brush head;

Figure 16 is a bottom plan view of a still further modified form of the brush head;

Figure 17 is a bottom plan view of the brush head shown in Figure 1, with the brush elements removed;

Figure 18 is a fragmentary longitudinal sectional view taken on line 18—18 of Figure 1.

By referring to the drawings in detail, it will be seen that

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20 designates one form of the vacuum cleaner brush head, which is preferably rectangular in shape. The brush head carries a valve housing 21 transversely across the center and top of the head 20, as shown in Figure 1. The conventional vacuum tube or hose connecting elbow 22, to which the vacuum tube or hose is adapted to be attached, carries a valve element or hollow sleeve 23, which is longitudinally slidable within the valve chamber 24. The elbow 22 is rotatably connected to one end of the sleeve 23. The chamber 24 is formed in the housing 21 and also extends down into the head 20, as shown in Figures 3 and 4, so as to mount the element 23 close to the bottom face of the head 20. The bottom face of the head 20 is provided with an elongated inlet vacuum or suction opening 25 formed therein.

The casing 21 as shown, is rectangular and the valve chamber 24 is circular in cross section to receive the valve element 23. The valve element 23 is freely slidable in the chamber 24 and has sufficient tolerance or clearance therein to prevent the trapping of air in the chamber 24 as the valve element 23 is moved to the position shown in Figure 4, from the position shown in Figure 3.

The valve element 23 comprises a hollow tubular body, one end of which fits over the angular extension 26 of the elbow 22 and is rotatably connected thereto. The opposite end of the valve element 23 is closed to define a piston-like member to provide a guide for the inner end of the valve element 23 within the chamber 24, as the valve element 23 moves longitudinally within the chamber 24. The valve element or hollow sleeve 23 is provided with a closure wall 27 at the inner end of the vacuum or suction opening 28 which is formed longitudinally of the bottom of the valve element or sleeve 23, as shown in Figures 2, 3 and 4.

The brush head 20, as is shown in Figure 2, is provided upon its under face with a central longitudinal channel 29 which extends from the ends of the head to the vacuum or suction aperture 25. A central brush element section 30 bisects or extends transversely across the center of the aperture 25, thereby defining a front opening and a rear opening on opposite sides of the brush element section 30. The ends of the brush section 30 project beyond the sides of the aperture 25 and fit within the longitudinal channel 29 adjacent the aperture 25. This brush element section 30 is preferably slipped longitudinally of the channel 29 to its position shown in Figure 2.

The head 20 is also provided with a plurality of converging channels 31 which converge from the corners of the head 20 toward the channel 29 near the aperture 25, to one side of the aperture 25, and a plurality of converging channels 32 which converge from the corners of the head 20 toward the channel 29 near the aperture 25. Elongated relatively narrow brush elements 33 fit in the channels 31 and similar brush elements 34 fit in the channels 32. All of these brush elements 33 and 34 are similar to the brush elements shown in Figure 11. These brush elements 33 and 34 are slidable longitudinally of the respective channels 31 and 32 from the corners of the head 20 toward the central brush element section 30, and abut the ends of the element 30 when in an operative position. A resilient bumper band 35 removably encases the edge of the head 20, as is shown in Figure 6 to retain the brush elements within their channels, as well as acting as a resilient bumper to avoid injuring or marring furniture or other objects with which the head 20 may come into contact. The portion of the channel 29 which extends between the channels 31 and 32 is preferably used to receive the filler strips 36 which are preferably rectangular in cross section as shown in Figure 7, so as to provide two sizes of adjustment. When these filler strips 36 are stored within the channel 29 they are retained therein by

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the bumper band 35 which extends across the outer ends of the channel 29.

As the brush elements wear, the elements may be removed and the filler strips 36 may be placed in the channels, as shown in Figure 9, to move the brush elements outwardly and thereby compensate for wear. The channels are preferably restricted in size near their outer faces and are preferably T-shaped in cross section to provide retaining flanges 37, as shown. The brush elements are preferably provided with a suitable reinforcing backing 38, as is shown in Figures 8, 9 and 11, which fits behind the flanges 37 to retain the brush elements in place.

If desired, the central brush element section 30 shown in Figure 2 may be replaced by the elongated central brush element 30^a which extends across the opening 25^a and for the full length of the channel 29^a of the head 20^a, as is shown in Fig. 12.

As is shown in Figures 2, 3 and 4, the central brush element 30 fits in the channel 20, and this central brush element extends centrally across the opening 25. The vacuum or suction opening 28 of the valve element or sleeve 23 receives the brush element 30, as shown in Figures 3 and 4, and the entrance opening 25 extends upon either side of the brush element 30.

The operation is as follows:

As the brush head is pushed forwardly, the valve element or sleeve 23 moves forwardly to the position shown in Figure 4, due to the fact that the brush elements by coming into contact with the floor or other support will frictionally resist forward movement until the element or sleeve 23 slides forwardly to the position where the rear wall 28^a abuts the brush reinforcing backing of the brush element 30. The brush head 20 may then move forwardly and the vacuum or suction opening 28 of the element or sleeve 23 extends forwardly of the brush element 30. The dust or other material collected forwardly of the brush element 30, and the forward brush elements 33 and 34, will be drawn through the front opening of the aperture 25 and suction opening 28 forwardly of the brush element 30. The rearwardly inclined brush elements 33 and 34 direct the dust or other material toward the center from the corners of the brush where the material is sucked through the aperture 25 and opening 28 through the elbow 22 into the conventional suction tube. As the suction tube is pulled rearwardly, the element or sleeve 23 slides rearwardly until the wall 27 abuts the central brush element 30 and the suction then takes place through the openings 28 and 25 rearwardly of the central brush element 30. The dust and other material will be guided toward the rear opening of the aperture 25 by the rear converging brush elements 33 and 34 toward the central brush element 30.

Since the valve element or sleeve 23 reciprocates transversely of the head, on the forward push the intake suction opening forwardly of the brush elements will be open, and on a rearward pull the valve element or sleeve 23 will slide rearwardly, thereby automatically closing the intake suction opening forwardly of the central brush element and automatically opening the intake suction opening rearwardly thereof. On a forward movement the brush elements direct material in front of the brush elements, toward the intake opening of the brush head, and on a rearward movement the brush elements direct material in the rear of the brush elements toward the intake element for the full width of the brush head. Because of the arrangement of the brush elements, the brush elements will draw dust and other materials from corners and points close to a wall.

As is shown in Figures 13 and 14, the brush head 39 is constructed similarly to the brush head 20, having converging brush elements 40 carried within channels 41, and a central brush element 42. A removable tapering brush element retaining plate 43 is fitted between the converging brush elements 40 upon opposite sides of the brush element 42, and this plate 43 fits snugly against the sides of

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the converging brush elements and retains these elements in the channels 41. The plates 43 are secured to the under face of the head 39 by means of screws 44.

As shown in Figure 15, the brush head 45 is provided with an intake opening 46, and a brush element 47 carried by the under face of the head 45 is inclined from one corner of the head 45 to a point beyond the center of the intake opening 46. A second brush element 48 is carried by the under face of the head 45 and is inclined from the diagonal corner of the head to a point beyond the center of the opening 46 and upon the opposite side thereof. A brush element 49 is carried by the under face of the head 45 and extends from one corner and converges toward the inner end of the brush element 47 and terminates short of the opening 46. A brush element 50 also is carried by the under face of the head 45 and converges toward the inner end of the brush element 48 and terminates short of the opening 46. All of these brush elements are arranged to direct dust toward the opening 46 as the brush head is moved over a surface to be cleaned.

In Figure 16 there is shown another modified form wherein the brush head 51 is provided with an intake opening 52. Two converging brush elements 53 at each end of the head 51, are carried by the under face of the head 51 and terminate short of the opening 52. These brush elements 53 extend from each corner of the head 51. V-shaped brush elements 54 and 55 are carried by the under face of the head 51 and point in opposite directions upon opposite sides of the opening 52 in line with the central transverse axis of the head, and are located near the respective front and rear edges of the head 51. This brush element arrangement is adapted to direct dust and other material toward the intake opening 52.

In the forms shown in Figures 15 and 16, no valve is used.

Having described the invention, what I claim as new is:

1. A vacuum cleaner brush head having an air intake means located near the center of said head, a brush means carried by said head, said brush means comprising two brush elements upon each side of said air intake means, converging toward said air intake means and converging from the side of the brush head to the center of the brush head and in a direction normal to the direction of movement of the brush head, and a portion extending across said air intake means thereby dividing said air intake means into a forward air intake opening and a rear intake opening, a valve housing carried by said head, a valve element slidable forwardly and rearwardly across said head in said housing in the direction of the movement of said brush head, said valve element being adapted to connect to a vacuum tube of a vacuum cleaner, said valve element having a suction opening adapted to selectively register with said forward and rear intake openings of said head as said valve element is moved forwardly and rearwardly across said head, the drag of the brush means upon a surface to be cleaned and the forward pushing of the operator's hand upon the vacuum tube causing said valve element to move in a forward direction upon said head to open the forward intake opening, and the drag of the brush means upon a surface to be cleaned and the rearward pull of the operator's hand upon the vacuum tube causing said valve element to move in a rearward direction upon said head to open the rear intake opening.

2. A vacuum cleaner head having an air intake means upon one face thereof and located near the center of said head, a brush means carried by said face of said cleaner head, said brush means comprising two brush elements upon each side of said air intake means and converging toward said air intake means from the side of the brush head to the center of the brush head and in a direction normal to the direction of movement of the brush head, and a portion extending across said air intake means thereby dividing said air intake means into a forward air

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intake opening and a rear air intake opening, a valve housing carried by said head, a valve element slidable forwardly and rearwardly across said head in said housing in the direction of the movement of said brush head, said valve element being adapted to connect to a vacuum tube of a vacuum cleaner and to slide forwardly and rearwardly across said head as said vacuum tube is selectively moved forwardly and rearwardly, said valve element having a suction opening adapted to register with said forward intake opening as said tube and valve element move forwardly, and said suction opening being adapted to register with said rear intake opening as said tube and valve element move rearwardly to selectively open the intake openings in front of the brush means to conform with the direction of travel of the cleaner head.

3. A vacuum cleaner head as defined in claim 2, wherein said brush means extends into said valve housing and constitutes an abutment engageable by said valve element to limit the sliding movement of said valve element in both directions to insure the registration of said suction opening of said valve element with the respective forward and rear intake openings.

4. A vacuum cleaner head as defined in claim 2, and

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wherein said brush elements are slidably and removably connected to said head, the brush elements being selectively slidable to and from said outer edge and said intake means for removal and replacement.

5. A vacuum cleaner head as defined in claim 2, wherein said brush elements are slidably and removably connected to said head, the brush elements being selectively slidable to and from said outer edge and said intake means for removal and replacement, and wherein a bumper band engages said outer edge of said head to hold said brush elements in place upon said head and against accidental removal from said head.

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