Nov. 24, 1953 D. R. WOOD 2,659,925

VACUUM FLOOR TOOL

Filed June 18, 1948

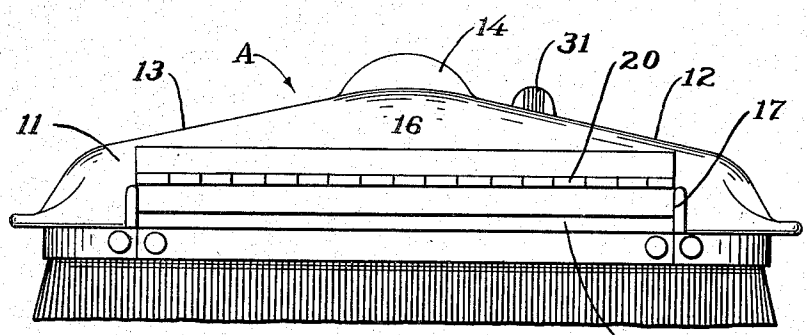

Fig. 1

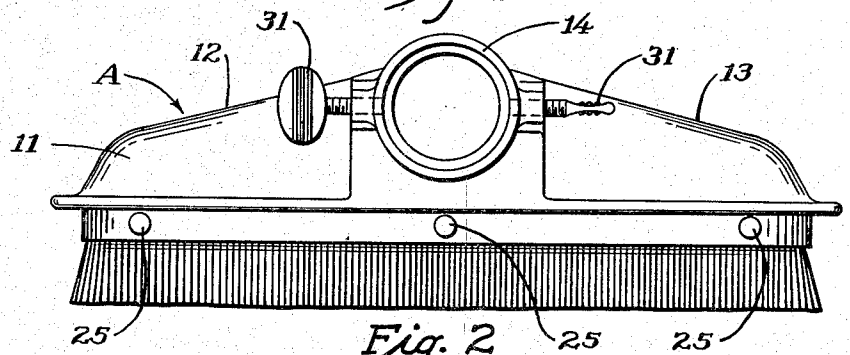

Fig. 2

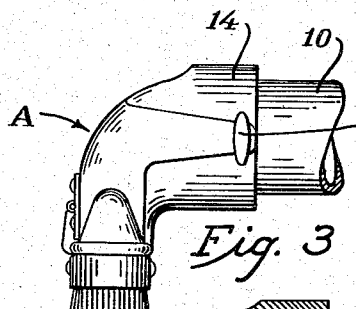

Fig. 3

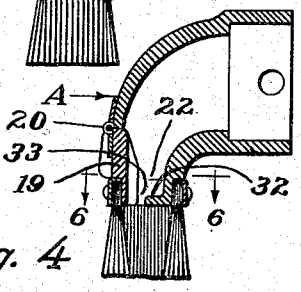

Fig. 4

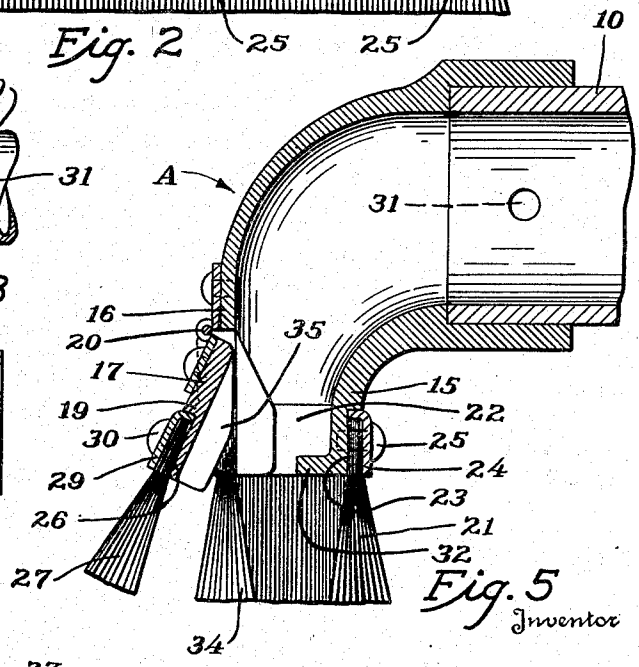

Fig. 5

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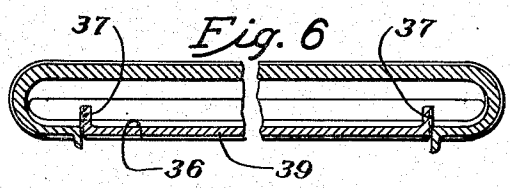

Fig. 6

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VACUUM FLOOR TOOL

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2 Claims. (Cl. 15—418)

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My invention relates to an improvement in a vacuum floor tool wherein it is desired to provide a vacuum head or attachment which will effectively pick up material from the floor.

Vacuum floor tools of the conventional type have certain disadvantages. If the passage through the head is of large size, the air passing through the head will not travel at a sufficiently high velocity to do an effective job of cleaning. On the other hand, if the size of opening in the head is extremely small, the opening is apt to become clogged or partially blocked by foreign particles being picked up and the resulting job accomplished is not most effective. Attempts have been made to provide suction cleaner attachments with apertures therethrough of different sizes which may be selectively used. In other words, the cleaner head is provided with both a large opening through the head and also with a smaller opening therethrough, either of which may be selectively connected to the vacuum supply. However, such heads are subject to the same difficulties as a head having a single opening therethrough and are somewhat larger and more awkward to handle.

It is the object of the present invention to provide a vacuum floor tool having an elongated inlet opening therein having an adjustable side wall. This side wall is swingable toward and away from the opposite wall of the opening. When the swingable wall is swung toward the opposite wall the opening into the vacuum head is of relatively small size. However, when the swingable wall is pivoted away from the opposite wall an opening of large size is automatically produced. As a result the size of the opening into the head may be varied at will.

A feature of the present invention lies in the provision of a vacuum head having an elongated inlet opening surrounded by a brush or wall of bristles. The bristle wall on one longitudinal side of the opening and on the ends of the opening are secured in fixed relation. The other longitudinal bristle wall is swingable toward or away from the fixed longitudinal wall so as to vary the size of opening.

A feature of the present invention lies in the provision of a cleaner head designed for connection with a suitable blower arrangement capable of producing a flow of air through the head and in providing a means of automatically varying the velocity of the air passing into the inlet of the head. If high air velocity is required to accomplish a certain cleaning task, the inlet opening of the head is restricted so as to produce

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this greater inlet velocity. On the other hand, if the head is to pick up a large piece of paper or other object of substantial size and of relatively light weight, the size of the inlet opening may be enlarged to accommodate such an object.

An added feature of the present invention lies in the fact that my tool is self-cleaning in operation. Any dust or particle of material which enters the intake of the head and is held from passing therethrough by the restricted size of the inlet opening will be automatically drawn into the cleaner head as the size of the opening is increased. As the size of opening normally varies in usual operation of my device, this variation in opening automatically prevents the collection of foreign objects within the device.

An added feature of the present invention lies in the provision of a vacum head which is provided with an elongated aperture normally arranged at right angles to the usual direction of travel of the head. One longitudinal edge of this opening is hinged in such a way that as the head is moved over the surface of the floor in one direction the size of the opening through the head is automatically decreased and as the head is moved in the opposite direction the size of the opening through the head is automatically increased. Thus the size of the opening may be immediately changed by merely changing the direction of motion of the head.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a front elevational view of my vacuum floor tool showing the construction thereof.

Figure 2 is a rear elevational view of the same.

Figure 3 is an end elevational view of the cleaner head.

Figure 4 is a sectional view through the cleaner head showing the swingable door in closed position.

Figure 5 is a view similar to Figure 4 showing the swingable door in open position.

Figure 6 is a bottom plan view of a modified swinging door or wall construction.

The vacuum floor tool A may be of various shapes to suit the machine with which it is used. A sample type of head is shown for the purpose of illustration. In the particular type of construction illustrated the head A is designed for connection to a hollow handle 10 which is connected by a flexible hose or other similar means

to a source of vacuum. Obviously the type of cleaner with which the head is used is not of importance in the present invention and has not been illustrated in detail.

The head A includes an elongated hollow body 11 having a pair of opposite upwardly sloping sides 12 and 13 which communicate with a rearwardly extending integral sleeve 14. As illustrated in Figure 5 of the drawings the elongated transversely extending body 11 is provided with a substantially vertical rear wall 15 and a substantially parallel front wall 16. This front wall 16 is provided with a generally rectangular opening 17 therein for accommodation of the swinging door or wall portion 19. The wall 19 in reality comprises merely a removable rectangular portion of the front wall 16 which is hingedly connected to the front wall 16.

As best illustrated in Figures 1, 4, and 5 of the drawings an elongated hinge 20 extends across the line of connection between the swingable portion 19 and the fixed front wall 16 to form a hinged connection therebetween. This swingable portion 19 may pivot from a position in substantial alignment with the front wall 16 as indicated in Figure 4 of the drawings to a forwardly and downwardly inclined position as best illustrated in Figure 5 of the drawings.

An elongated brush element encircles the periphery of the lower end of the head A. This brush comprises an elongated strip of bristles 21 which extends along the rear wall 15 and around the closed end wall 22 of the body. As indicated in Figures 4 and 5 of the drawings the rear wall 15 as well as the end walls and the portion of the front wall beyond the ends of the swingable member 19 are grooved or notched at 23 so that the bristle unit 21 may extend substantially flush with the outer surface of these walls. A clamping strip 24 extends outwardly of the upper bound edge of the bristle strip 21 so as to clamp the bristle strip in place against the body. The clamping strip 24 is held in place by spaced cap screws or bolts 25.

As also illustrated in Figures 4 and 5 of the drawings the front swingable wall 19 is also notched as indicated at 26 to accommodate the upper bound edge of the bristle strip 27. A clamp strip 29 extends outwardly of the upper bound edge of the bristle strip and clamps the bristle strip in place, cap screws 30 or other suitable means holding the clamping strip in place.

One or more set screws, such as 31 may be provided through the sleeve portion 14 to permit attachment of the tool A to the handle 10 or to the tubular suction connection. These set screws 31 may either clamp the head tightly to the handle 10 or may extend into a peripheral groove about the handle to permit relative rotation between the head and the handle, if such pivoting action is desired.

An observation of Figures 4 and 5 of the drawings will also indicate that the rear wall 15 is provided with a laterally extending lip 32 which extends forwardly and partially closes the lower end of the head opening. When the swingable wall 19 is in vertical position illustrated in Figure 4 of the drawings, the space 33 between the forward edge of the lip 32 and the rear surface of the wall 19 is relatively narrow so that the velocity of air passing through this opening is relatively high. When the swingable wall 19 is pivoted into the position illustrated in Figure 5 of the drawings, the space 33 between the lip 32 and the rear surface of the wall 19 is relatively large

and the velocity of the air passing through this opening into the head is relatively lower.

In order to prevent air from entering the head between the ends of the bristle strip 27 on the hinged wall 19 and the adjacent portions of the bristle strip 21, I may provide shields 35 at opposite ends of the swinging wall 19. These shields 35 extend rearwardly from the end edges of the wall 19 to close any gap between the bristles of the two bristle strips and thereby prevent air from entering through a gap in the bristle strip and thereby reducing the efficiency of the cleaner head.

The operation of the tool is believed obvious from the foregoing description. When the head is placed upon the floor or other surface to be cleaned the lower edge of the bristle strips contact the floor or surface and form a bristle wall through which or about which air must pass in order to enter the suction head. As a result the particles of dust and other foreign materials on the surface are agitated by the bristles and loosened thereby so that they may easily enter the head.

When the head is moved in a forward direction the friction of the bristle strip 27 against the floor or surface being cleaned swings the hinged wall 19 toward the fixed wall 15 moving the parts into the position illustrated in Figure 4 of the drawings. When in this position the space 33 between the fixed lip 32 and the hinged forward wall 19 is relatively small and air is drawn into the head at high velocity.

As the cleaner head is moved in a rearward direction the friction of the bristle strip 27 on the surface being cleaned tends to swing this strip forwardly into the position illustrated in Figure 5 of the drawings. This automatically increases the size of the space 33 between the lip 32 and the hinged wall 19 and permits the dislodgment of foreign materials from the bristles and permits the passage through the head of large objects which were previously blocked from entering the head by the relatively small size of the restriction 33.

It has been found that certain particles and objects are more easily picked up by the head when the swinging wall is in the position illustrated in Figure 4 of the drawings and other objects and particles more easily enter the head when the door is swung into the inclined position illustrated in Figure 5 of the drawings. As the door or wall automatically swings during normal operation of the head over the surface being cleaned, a more effective job of cleaning can be accomplished than is otherwise possible.

In Figure 6 of the drawings I disclose a modified form of construction in which the ends of the bristle strip on the swinging tool or wall curve rearwardly at the ends of the door to prevent any gap between the fixed bristles and the bristles on the door when the door is swung open. In this construction the bristle strip 36 is provided with rearwardly bent ends such as 37 which are at each end of the swinging door 39. When the door 39 swings into the open or forwardly inclined position the bristle strip ends 37 close any gap between the fixed bristle strip 21 and the bristle strip on the closure.

In accordance with the patent statutes, I have described the principles of construction and operation of my vacuum cleaner head, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope

of the following claims without departing from the spirit of my invention.

I claim:

1. A vacuum cleaner head comprising an elongated hollow body provided with spaced front and rear walls defining an elongated opening, an elongated notch in said front wall and extending part way across the width thereof, said notch being adjacent to and in communication with said opening, a closure member hingedly secured along its upper edge to said body to normally close said notch, a pair of inturned shields on the opposite ends of said closure member in sealing relationship with the ends of said notch, the inner edges of said shields being spaced from said rear wall when said closure member is in closed position to thereby provide communication to utilize the entire length of said elongated opening when vacuuming with the closure member in said closed position.

2. A vacuum cleaner head comprising an elongated body provided with spaced front and rear walls and connecting end walls defining an elongated opening, said front and rear walls being substantially vertical and parallel, an elongated notch in one of said walls, a closure member hingedly secured along its upper edge to said one wall to normally form a continuation thereof

and close said notch, the upper edge of said closure member abutting against the lower edge of said one wall along the top of said notch and being limited in its inward pivotal movement to substantial alignment with said one wall, said closure being pivotal outwardly to increase the cross-sectional area of said elongated opening.

DELOS R. WOOD.

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