Oct. 14, 1952 F. G. WALKER 2,613,388

VACUUM CLEANER AIR NOZZLE AND ADJUSTABLE BRUSH THEREFOR

Filed March 15, 1947

Fig. 1

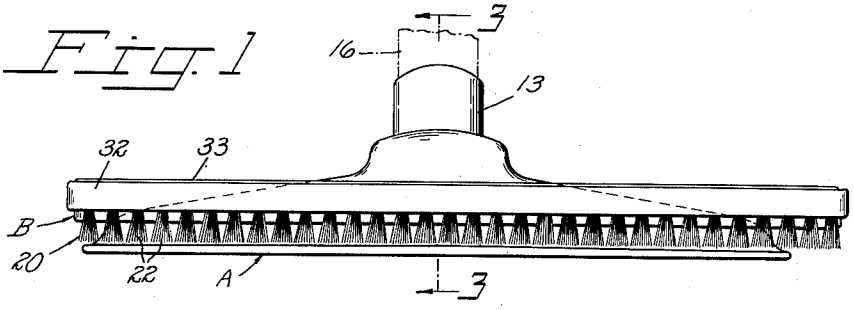


Fig. 2

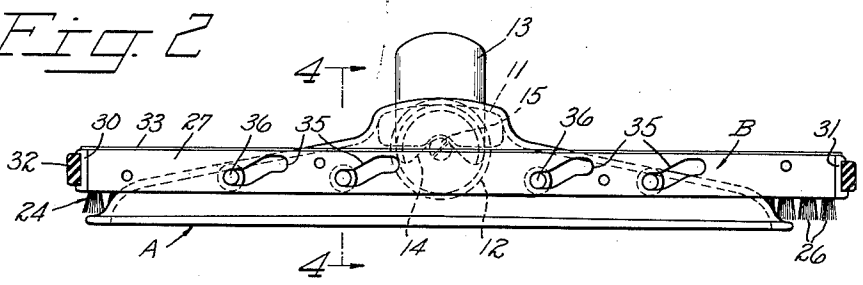


Fig. 3

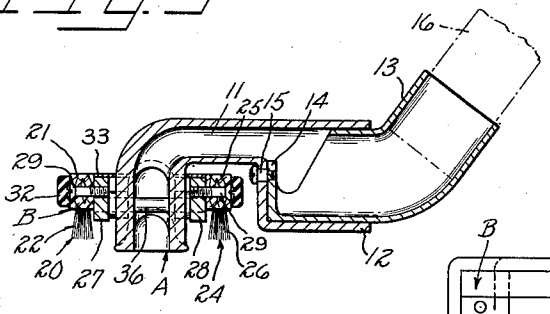


Fig. 5

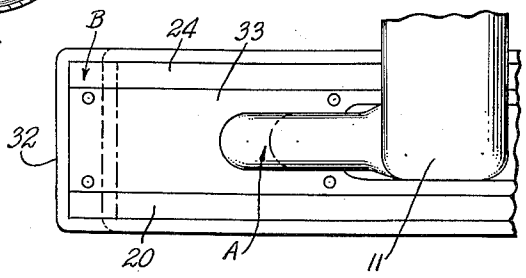
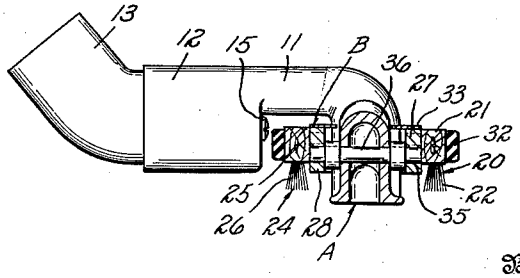


Fig. 4



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VACUUM CLEANER AIR NOZZLE AND ADJUSTABLE BRUSH THEREFOR

Frank G. Walker, Santa Barbara, Calif.

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5 Claims. (Cl. 15—373)

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The present invention relates generally to suction cleaning apparatus, and more particularly to an improved and novel attachment or head for use with vacuum cleaners of the tank type to increase the efficiency and facility with which such tank-type cleaners may be used.

The present invention is directed to the problem of providing an attachment or head for a tank-type vacuum cleaner which will be effective for cleaning both carpeted areas and bare or smooth floor areas so that it is unnecessary to change attachments when moving from one type of area to the other, or conversely, so that it is unnecessary to clean only one type of surface at a time. As is well known, the conventional attachment or head for tank-type vacuum cleaners adapted to be used for cleaning rugs and carpeted areas comprises a suction nozzle which is adapted to be moved over the area to be cleaned in intimate contact with the rug or carpet. In connection with bare floor areas, however, a brush is essential in order to properly clean the surface and, when such brush is utilized, suction must be applied within the brush to draw in air through the bristles of the brush in order to render the attachment or head effective for the intended purpose. Heretofore, it has been necessary to change the attachment or head every time the vacuum cleaner is utilized with a different kind of surface, or, in the alternative, to clean all of one type of surface such as the rug or carpeted areas in one continuous operation and then thereafter to clean the uncarpeted or smooth floor areas. Either procedure has the obvious disadvantages of requiring extra work and time.

It is a general object of the present invention to provide an improved and novel attachment or head for a tank-type vacuum cleaner, which head is utilizable selectively for either carpeted or bare floor areas and which, in either selected use, has all of the advantages of a separate attachment made especially for such use.

A more specific object of the invention is to provide an attachment or head for a vacuum cleaner of the tank type which may be transformed from a carpet cleaning nozzle to a bare floor brush so that the advantages of either form may be obtained selectively without need for changing attachments.

A further object of the invention is to provide an attachment or head of the character described which may be transformed from rug or carpet cleaning type to bare floor cleaning type in a simple manner without the use of springs or levers or similar devices requiring manipulation by the operator.

A further object of the invention is to provide

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a device of the character described which is of simple construction and relatively inexpensive to manufacture, which device is fabricated with a minimum of parts and which is of rugged construction so as to withstand normal wear without breakage or malfunctioning.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the drawing—

Figure 1 is a front view of the improved attachment formed in accordance with the invention;

Fig. 2 is a view similar to Fig. 1 with the front brush member removed to more clearly show the construction of the device;

Fig. 3 is a cross sectional view taken along the line 3—3 of Fig. 1;

Fig. 4 is a cross sectional view taken along the line 4—4 of Fig. 2; and

Fig. 5 is a fragmentary top plan view of the nozzle and brush assembly, showing the two adjusted positions of the brush frame relative to the nozzle.

Referring to the drawing in detail, the improved attachment of the present invention is shown as comprising a suction nozzle A which, in shape and form, is similar to the nozzle conventionally utilized heretofore for cleaning rugs and carpeted areas. The nozzle A is formed with an oblong-shaped outlet passageway 11 which extends outwardly, i. e. rearwardly, away from the nozzle in a substantially horizontal plane from the top thereof and terminates in a cylindrical socket portion 12 of circular cross section. Received in this socket portion 12 is a suction tube elbow fitting 13 which has an upturned flange 14 at its inner end where the elbow fitting may be pivotally secured to the socket 12 at its axis of rotation by means of the screw 15. The opposite end of the elbow fitting 13 is adapted to detachably receive the end of a suction tube 16 shown in dot and dash lines in Figs. 1 and 3 in the usual manner. As will be apparent by means of the above-described connection, it is possible for the user to manipulate the nozzle by using the suction tube 16 as a handle and it is possible to rotate the handle through a desired arc with respect to the nozzle.

Extending across the front and rear of the nozzle A are a pair of brushes 20 and 24 which are comprised of the brush backs 21 and 25, respectively, and a plurality of bristle tufts 22

and 26 extending downwardly therefrom. As illustrated in the drawing, the brush backs may be formed of wood with the bristle tufts embedded therein in the usual manner. The brushes 20 and 24 are rigidly secured to cam plates 27 and 28, respectively, by means of a plurality of bolts 29. The cam plates 27 and 28 are formed into a rigid frame generally denoted by reference letter B circumscribing the nozzle A by means of end plates 30 and 31. A soft rubber bumper 32 extends around the brush backs 21 and 25 and the end plates 30 and 31 to insure that the head may be utilized without marring or scratching furniture and like articles in the path of the brushes.

The frame B formed by the cam plates 27 and 28 and end plates 30 and 31 closely fits along the front and rear of the nozzle A but is sufficiently elongated to permit relative movement between the frame B and the nozzle A in an endwise direction, provision for such movement being necessitated by the mounting of the cam plates 27 and 28 and hence the frame B on the nozzle A. As shown more clearly in Fig. 2, the cam plates 27 and 28 are formed with a plurality of slots 35 (shown four) in which are received pins 36 extending horizontally from front to rear through the nozzle A. The slots 35 are inclined at their central portions and are provided with flat, horizontal portions at their ends. As will be apparent, when the frame B is moved to the extreme right-hand position, as shown in Fig. 2, the frame B is forced upwardly by the camming action of the central inclined portions of the slots 35 and pins 36 so that the brushes 20 and 24 are raised above the lower edge of the nozzle A and will be releasably held in this upper position by engagement of the pins 36 in the flat portions of the lower ends of the slots 35. When the frame B is moved to the opposite extreme, the action is reversed with the frame B being forced downwardly so that the cam plates 27 and 28 are brought to the lowermost position with the brushes 20 and 24 extending below the lower edge of the nozzle A and being retained in this position by engagement of the pins 36 in the flat portions of the upper ends of the slots 35. Inasmuch as there are no springs or similar devices effecting this action and there is no need to employ any levers or similar actuating members, it is necessary only to exert a light pressure or tap one end of the frame against a convenient object which will quickly move the brushes from the raised to the lowered position, or vice versa, as desired. As will be understood from the above description, the brushes 21 and 25 are securely fixed to and move with the cam plates 27 and 28 and, if desired, they may be formed as a single unit.

A top plate 33 extends across the top of the frame B and is adapted to fit relatively snugly around the nozzle A when the frame is moved to the lowermost position thereby insuring that air will be drawn in through the bristles of the brushes as well as improving the appearance of the attachment.

As will be understood from the above description, the attachment or head of the present invention is an all-purpose head which may be secured to the suction tube of a tank-type vacuum cleaner and may be utilized to clean rugs and carpeted areas or bare floor areas without removing or replacing the attachment and with all the effectiveness of the plurality of attachments heretofore required. As will be apparent, the frame B in the upper position is spaced a sufficient distance above the bottom of the nozzle A so as not to interfere in any way with the operation of the nozzle and without preventing the use of same in corners and the like for cleaning rugs and carpeted areas. If it is then desired to clean a bare floor area, it is necessary only to tap the attachment against a convenient object or the foot of the user, which immediately lowers the brushes to a position where the bristles 22 and 26 extend below the lower edge of the nozzle A. In this position, the brushes extend along and beneath both the rear and front of the nozzle so that the nozzle acts merely as an extension of the suction tube causing the suction to be applied within the brush thereby causing the air to be sucked in through the brush bristles, thereby providing a desired cleaning action for bare floor areas and permitting the bristles to come into contact with corners and the like.

It thus will be seen that there has been provided, in accordance with the invention, a highly useful and efficient device for facilitating the normal cleaning of floor areas, particularly where such floor areas include both rugs and bare floor sections. With it, the operator can advance continuously through the room, cleaning the various types of flooring as encountered without raising the attachment from the floor and merely by tapping the head against some object being able to convert the head from rug cleaning to bare floor cleaning form. The device is of simple construction eliminating all unnecessary parts, is simple to use and convenient to handle, and is not any more cumbersome than the single purpose attachments heretofore provided for tank-type cleaners.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. A combination brush and air nozzle attachment for vacuum cleaners of the tank type comprising a nozzle member having an elongated, downwardly extending open end adapted to be moved over a carpeted area in intimate contact therewith for cleaning same, means for detachably connecting the nozzle member to the suction tube of a tank-type vacuum cleaner, a brush assembly comprising a frame of greater length than the nozzle member adapted to extend around the periphery of the open end of the nozzle member and a plurality of brushes extending downwardly therefrom in the front and rear of the nozzle member, and mounting means for positioning the brush assembly comprising a plurality of pins extending through the nozzle member received in a plurality of inclined slots in the frame of the brush assembly whereby the brush assembly will be moved up and down as it is moved longitudinally with respect to the nozzle member and the frame will extend beyond an end of the nozzle, said slots being formed with substantially horizontal end portions operative

in one longitudinal position of the brush assembly for retaining the brush assembly with the brushes spaced above the open end of the nozzle member to permit the cleaning of carpeted areas and in the opposite longitudinal position of the brush assembly for retaining the brush assembly with the brushes extending below the open end of the nozzle member whereby the attachment may be utilized for cleaning bare floor areas, said brush assembly being free to move vertically and horizontally within the range permitted by said pins and slots in response to pressure on either end of said frame.

2. A combination brush and air nozzle attachment for vacuum cleaners of the tank type comprising a nozzle having an elongated, downwardly extending open end, means for detachably connecting the nozzle to the suction tube of a tank-type vacuum cleaner, a frame of greater length than the nozzle adapted to be moved in an inclined direction to and from a position about the open end of the nozzle and extending outwardly from an end of the nozzle, means interconnecting the frame and the nozzle comprising a plurality of outwardly extending pins mounted on the nozzle and received in inclined slots in the frame whereby the frame may be moved upwardly from and downwardly toward said position about the open end of the nozzle when a force is applied to either end of the frame, said slots being formed with substantially horizontal end portions for receiving the pins when the frame is moved to the extreme longitudinal portions with respect to the nozzle, a cover member for said frame extending across the end portions of the nozzle, and a pair of brushes secured to said frame at the front and rear of the nozzle and arranged to extend below the open end of the nozzle when the frame is in its lowermost position to provide a brush attachment for cleaning bare floors and to be spaced above the open end of the nozzle when the frame is in its uppermost position to provide an attachment for cleaning carpeted floors.

3. A combination brush and air nozzle attachment for vacuum cleaners of the tank type comprising a nozzle having an elongated, downwardly extending open end, means spaced from the open end adapted for detachably connecting the nozzle to the suction tube of a tank-type vacuum cleaner, a brush assembly comprising a pair of brushes extending exteriorly along the front and rear of the nozzle and sufficiently elongated to permit longitudinal movement of the brush assembly relative to the nozzle to positions where the brush assembly extends beyond either end of the nozzle, and mounting means comprising a plurality of pins extending laterally outwardly from the nozzle and a plurality of slots in said brush assembly for receiving said pins, said slots being formed with substantially horizontal end portions and intermediate inclined portions whereby in one extreme longitudinal position of the brush assembly the brush assembly is held with the brushes extending below the open end of the nozzle and whereby the brush assembly is moved to and held in an elevated position with the brushes above the open end of the nozzle when the brush assembly is moved to the opposite extreme longitudinal position, said movements being responsive to force applied to the extending end of the brush assembly.

4. A combination brush and air nozzle attachment for vacuum cleaners of the tank type comprising a nozzle having an elongated open end,

means extending outwardly from the nozzle and spaced from the open end adapted for detachably connecting the nozzle to the suction tube of a tank-type vacuum cleaner, a frame of greater length than the nozzle extending around the periphery of the open end of the nozzle, said frame being positioned closely adjacent the exterior surfaces of the front and rear of the nozzle and being sufficiently elongated to be movable longitudinally of the nozzle so as to extend beyond either end thereof, brush members mounted on said frame extending along the front and rear of the nozzle and exterior thereto, a cover for said frame having an elongated central opening through which the nozzle extends, and means interconnecting the nozzle and frame comprising a plurality of pins mounted on the nozzle and extending transversely outwardly from the front and rear of the nozzle, and a plurality of inclined slots in the frame for receiving the pins whereby the frame may be selectively and freely moved up and down relative to the nozzle by forcing it longitudinally of the nozzle as by pressing the ends of the frame, said slots being formed with substantially horizontal end portions for retaining the frame in an uppermost position with the brushes spaced above the open end of the nozzle and in a lowermost position with the brushes extending below the open end of the nozzle.

5. A combination brush and air nozzle attachment for vacuum cleaners of the tank type comprising a nozzle member having an elongated, downwardly extending open end adapted to be moved over a carpeted area in intimate contact therewith for cleaning same, means for detachably connecting the nozzle member to the suction tube of a tank-type vacuum cleaner, a brush member of greater length than the nozzle member comprising a pair of brushes extending exteriorly along the front and rear of the nozzle member, and mounting means operative for selectively positioning the brushes above and below the open end of the nozzle member when the brush member is moved longitudinally with respect to the nozzle member to extend from either end of the nozzle, said attachment being utilizable as a brush for smooth floors when the brush member is in the lowermost position, said mounting means comprising a plurality of pins on one of said members and inclined slots in the other of said members receiving the ends of said pins, said slots having substantially horizontal end portions for retaining the pins when the mounting means is in the uppermost and lowermost positions, respectively, said mounting means and said brush member being free to move vertically and horizontally within the range permitted by said pins and slots in response to pressure applied to either end of the brush member.

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