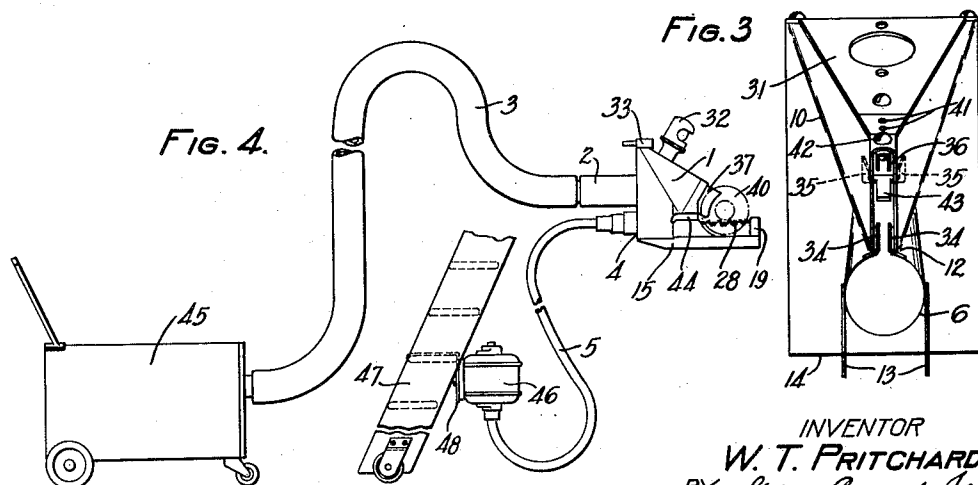
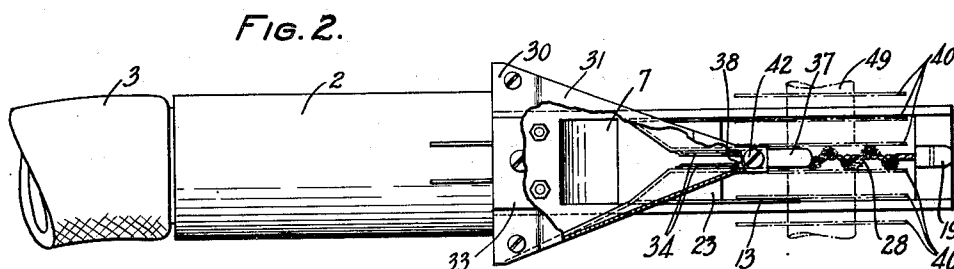
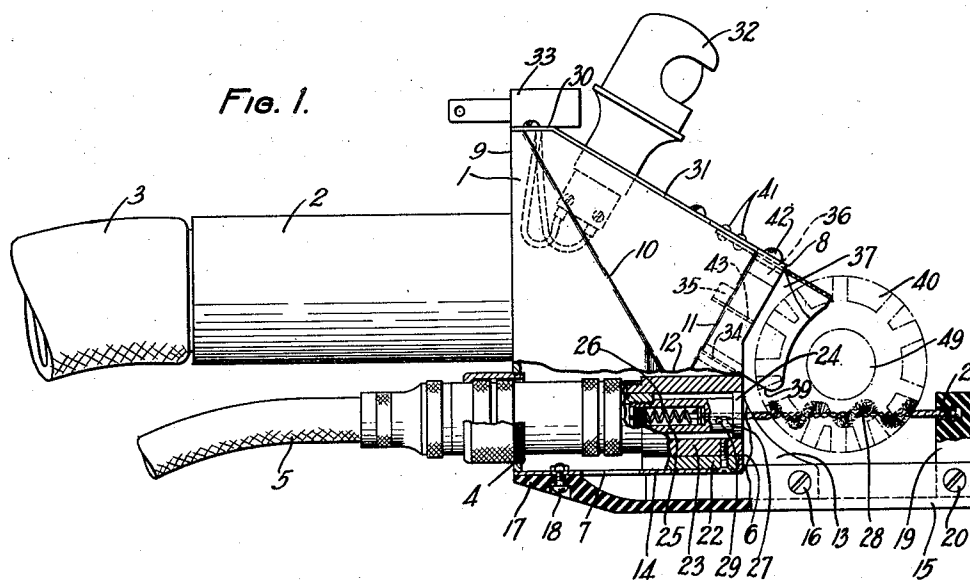


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W. T. PRITCHARD
VACUUM CLEANER APPARATUS

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VACUUM CLEANER APPARATUS

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This invention relates to a vacuum cleaner attachment or nozzle of the type in which a rotatable member supported in the nozzle is employed to brush or abrade the surface to be cleaned and more particularly relates to an attachment of this type adapted for cleaning the faces of comparatively closely spaced members, such for instance, as the cams in sequence switches employed in electrical signaling systems.

Features of this invention reside in the form and construction of the nozzle, the supporting of the brush or abrading member in the nozzle, the remotely locating of the suction apparatus and brush driving motor with respect to the nozzle so that the nozzle and brush, unencumbered, may be readily moved about and the brush inserted between the comparatively closely spaced members, and in the provision of lighting means whereby the nozzle may be used under varying light conditions.

In automatic telephone systems where a great number of contacts are employed in making the various connections required to establish communication facilities between different parts of the system, it has been found oftentimes difficult to keep the various contact surfaces clean due to the position of the contacts or to the close spacing of them to other parts. This is particularly true in regard to the contact surfaces of sequence switches employed in automatic telephone systems of the panel type where a plurality of cams comprising discs of insulating material bearing variously positioned electrical contact surfaces are comparatively closely spaced on a rotatable shaft which is rotated to bring the variously positioned contact surfaces into engagement with a set of wiper arms.

To provide means to thoroughly clean the cams of these sequence switches, and to take up any particles abraded or brushed from the cam surfaces, the vacuum cleaner apparatus of this invention has been devised.

In the accompanying drawings, Fig. 1 is a side view of the vacuum cleaner nozzle, with certain portions broken away to disclose certain of the parts contained therein and with a sequence switch cam shown as being engaged by the cleaner brush. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is an end view of the nozzle with the brush holder and certain other portions removed so that features of the nozzle construction may be clearly seen, and Fig. 4 is a diagrammatical illustration of the nozzle attached to a portable suction device and to a suitable brush driving motor carried on a rolling ladder.

To further explain this invention, reference will now be made to the various parts shown in the drawings in which 1 is a metal enclosure or casing having an outlet 2 for attachment to the hose 3 of a suction device, a threaded opening 4 to receive a coupling of a flexible shaft 5, a round comparatively large opening at 6, an opening in the base at 7 and a comparatively narrow opening at 8. The side walls of the casing which are in this instance of sheet metal converge from the rear wall 9 toward the comparatively large opening 6 and the narrow opening 8 and are rather sharply creased as shown at 10 and the degree of convergence is greater from the rear wall 9 to the line 10 than from the line 10 to the narrow opening 8. The side walls are again creased at line 11 where they are brought to run in parallel to form the narrow opening 8. The lines or creases 10 and 11 nearly meet at a point 12 but at this point the side walls bulge outward to form the large opening 6 and terminate in parallel extended foot portions 13.

To these foot portions 13 which extend below the base plate 14 is attached a channel member 15 of insulating material, the foot portions 13 fitting into the channel member and against the sides thereof and being secured thereto by screws 16. The rear portion of the channel 15 is closed and beveled at 17,

at which point it is secured to the base plate 14 of the casing by bolts 18. The free or outer end of the channel member 15 is closed by a post 19 of insulating material which is secured therein by screws 20 and has in the upper portion a bearing 21. Secured within the casing 1 in the large opening 6 and supported by block 22 is a bearing 23 in which is rotated by means of a flexible shaft 5, a spindle 24. The spindle 24 is bored at 25 to receive a spring 26 and is bored at 27 to receive a brush 28 which is supported at its ends in bearing 21 in the post 19 and the spindle 24. The brush has a twisted wire shank which at one end is provided with a flat side which when the shank is inserted in bore 27 of spindle 24, is engaged by a cross pin 29 set across one side of the bore 27. The end of the brush shank extends into the spring 26 which under normal conditions serves to keep the brush pushed into the bearing 21 in the post 19. When it is desired to remove the brush from the spindle 24 and the post 19, the brush shank is pushed against spring 26 until the end of the shank resting in the bearing 21 is withdrawn therefrom when by slight displacement of the brush from alignment with bearing 21, the shank may be withdrawn from spindle 24.

The cover or top of the casing 1 comprises a narrow flat top portion 30 and a long sloping portion 31 which is of substantially triangular outline and slopes toward the narrow opening 8. A dash lamp 32 and a terminal block 33 are supported on the sloping portion 31 and flat top portion 30 respectively.

Secured within the narrow opening 8 by means of springs 34—34 and 35—35 and an expandible element 36 shown in Fig. 3 is an insulating nozzle tip 37, the inner end of which is slid between the springs 34 and 35 and the adjacent wall portions of the casing to which the springs are fastened. The nozzle tip 37 which in this instance is formed of a centrally folded strip of fibrous insulating material, slotted at 38 and with free end portions 39, forms a hood to fit adjacent the face cam surfaces of a sequence switch and in operative relation with respect to the brush. The expandible element 36 is secured to the top 31 of the casing at 41 and is expanded by means of screw 42 to press the sides of the nozzle tip 37 against the inner side wall surfaces of the casing 1. Integral with and joining the springs 35—35 is an extension portion 43, which projects between the folded side walls of the nozzle tip 37 and prevents collapsing of the nozzle tip when suction is applied.

The bearing 23 which is supported in the large opening 6 of the casing is sweated or soldered into the large opening 6 to prevent air leakage and turning of the bearing within the casing. To facilitate the soldering in of the bearing 23, slots 44 in which solder may

be run are provided in the casing 1 as shown in Fig. 4.

The brush 28 is designed to fit between the face to face surfaces of the comparatively closely spaced cams of a sequence switch with a slight displacement of the brush bristles and the bristles are of insulating material to prevent the creating of a short circuit between the sequence switch cams. The nozzle tip 37 and the channel member 15 together with the post 19 are also of insulating material to prevent short circuiting between the cams or the forming of any electrical connection between the contact surfaces of the cams and the vacuum cleaner nozzle.

To apply suction to the nozzle or casing 1, a portable suction device 45 which may be a vacuum cleaner device of standard construction is provided as shown in Fig. 4, being connected to the nozzle by flexible hose 3.

To drive the brush 28 motor 46 is provided, being coupled to the brush holding spindle 24 by flexible shaft 5 which enters the casing 1 at 4 and is of a well-known construction. In order that the motor may be moved about from place to place to follow the nozzle 1 the motor 46 is supported on a standard rolling ladder 47 by a bracket 48.

The dash lamp 32 shown as mounted on the casing 1 may be connected through the connector block 33 to any suitable source of lighting current and is provided so that the vacuum nozzle may be used under varying light conditions.

In cleaning the cams of a sequence switch the cams 40 which are mounted on a shaft 49 as shown in Fig. 2 are continuously rotated while the cleaner apparatus is brought into operation, the cleaner apparatus being moved into position as shown in Figs. 1 and 2 with the brush 28 inserted between two of the cams 40 and engaging the face to face flat surfaces thereof. The brush 28 is rotated to brush or abrade the cam surfaces, being driven by the motor 46 through flexible shaft 5. At the same time, the suction apparatus 45 is operated so that dust or particles dislodged from the cam surfaces or any bristles becoming disengaged from the shank of the brush will be drawn upward through the narrow opening 8 or along the channel portion 15 and into the casing 1, thence through outlet 2 and flexible hose 3 into the suction apparatus 45.

It will be seen that the vacuum cleaner apparatus above described provides means by which the cams of sequence switches may rapidly and efficiently be cleaned and that with both the suction apparatus and the brush driving motor remote from the cleaner nozzle and supported so that they may readily be moved along from place to place an entire bank or frame of sequence switches may be rapidly gone over and thoroughly

cleaned and put in good operating condition without having to remove from their supports any of the switches or parts thereof.

tween the bearing in the casing and the post in the channelled member, said upper inlet having a tip of insulating material projecting over part of the rotatable member, means to connect the rotatable member to a driving motor, and an outlet connection in the casing to connect to a suction device.

In witness whereof, I hereunto subscribe my name this 1st day of April, 1929.

WILLIAM T. PRITCHARD.

While the apparatus described has been designed for a particular purpose, it is evident that it may be found useful in cleaning other apparatus wherein the operating parts to be cleaned are so arranged as to be inaccessible to the well-known and standard forms of vacuum cleaning devices and the scope of this invention is considered therefore to be such as set forth by the following claims.

What is claimed is:

1. A vacuum cleaner nozzle comprising an upper portion having a forwardly directed inlet, and a lower portion extended beyond said upper portion, a rotatable member supported in the lower portion, said upper portion projecting over part of the rotatable member, said nozzle having an outlet for connection to a suction device, and means for connecting the rotatable member to a driving motor.

2. A vacuum cleaner nozzle comprising an upper forwardly directed inlet portion and a lower forwardly directed inlet portion extended beyond the said upper portion, a rotatable member supported in the lower portion, said upper inlet portion extending partly over the rotatable member, an outlet connection for connecting to a suction device and means for connecting the rotatable member to a driving motor.

3. A vacuum cleaner nozzle comprising an upper forwardly directed inlet portion and a lower forwardly directed inlet portion extending beyond the upper portion, a rotatable brush supported in the lower portion, said upper inlet portion extending partly over the rotatable brush, an outlet for connecting to a suction device and means for connecting the rotatable brush to a driving motor.

4. A vacuum cleaner nozzle comprising a casing having converging side walls forming an upper forwardly directed inlet, a lower inlet formed in a lower wall of the casing, a channelled member supported by the casing extending below and forwardly of the lower inlet and beyond the upper inlet, a rotatable member supported longitudinally in the channelled member, said upper inlet projecting over part of the rotatable member, an outlet connection in the casing for connecting to a suction device and means for connecting the rotatable member to a driving motor.

5. A vacuum cleaner nozzle comprising a casing having walls converging to form an upper forwardly directed inlet, a lower inlet formed in a lower wall of the casing, a channelled member of insulating material secured to the casing and extending from the lower inlet beyond the said upper inlet, a bearing in the casing and a post in the outer end of the channelled member, a rotatable member supported parallel to the channelled member be-

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