July 30, 1957 H. WESSEL 2,800,678

CLEANING NOZZLES

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Fig. 1

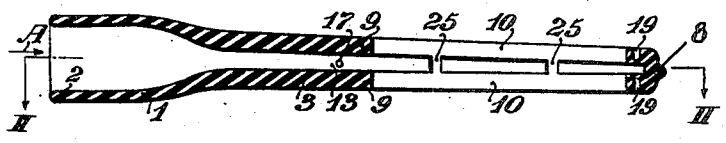


Fig. 2

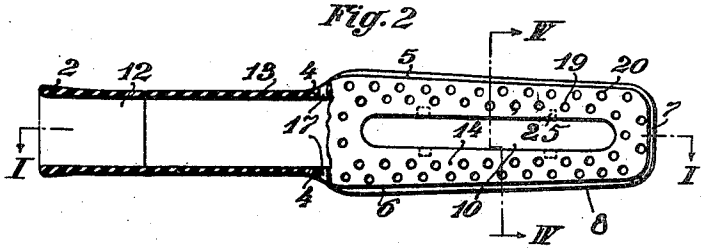


Fig. 3

Fig. 4

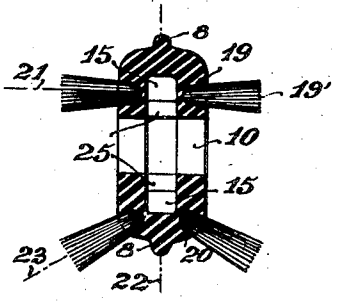
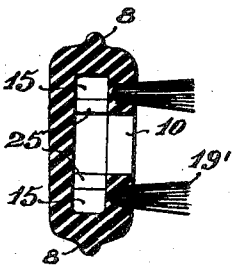


Fig. 5



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CLEANING NOZZLES

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2 Claims. (Cl. 15—367)

This invention relates to improvements in appliances used in connection with cleaning apparatus.

Vacuum cleaners are frequently used for the purpose of removing by suction the accumulations of dust from heating bodies, radiators and the like. With the hitherto available appliances, more particularly the usual vacuum cleaner nozzles, an adequte removal of the dust was not possible for the reason that the radiators composed of many ribs have many inaccessible spaces, in which the dust adheres in the course of time and which it is not possible to get at sufficiently closely with the usual vacuum cleaner nozzles, so as to remove the dust.

The present invention tends to overcome the aforesaid and other disadvantages and contemplates a nozzle structure having an aperture, which is not arranged as has been hitherto usual at the front end of the nozzle, but is of elongated shape and provided with correspondingly long slots at the side faces of the nozzle. This has the advantage that the suction cross-section does not only extend as hitherto at the front orifice, namely, over a relatively small region, but that this region is considerably extended, whereby the suction effect can be greatly increased, that is to say it is no longer essential as hitherto to sweep laboriously with the nozzle aperture over large surfaces of the radiator; all that is required is to pass the nozzle once from top to bottom in the intermediate spaces between each two ribs.

For still further adapting the nozzle to these special requirements in cleaning radiators, it is of advantage to make the nozzle in the form of a flat, elongated body and to provide the slot-like apertures on the two flat sides. If the nozzle be introduced into the narrow interstices between each two radiator ribs in such a manner that the nozzle surface extends parallel to the direction of the radiator ribs, the slots will be directed to the right and left and will suck the air from the places where the accumulation of dust is mainly to be found.

As the dust frequently tends to stick to the surface through heat action of the radiator and gets caked on, the cleaner nozzle will preferably be provided with bristles which are arranged round the slots in one or more rows. On the vacuum cleaner nozzle being pushed along between the radiator ribs, these bristles will sweep along the surfaces of these ribs and along the inner sides thereof and first of all brush the dust from the surfaces. The dust will then immediately be sucked off through the suction action and through the slots. In order that the bristles of the cleaner nozzle may be able to reach all places, even the most inaccessible places, between the radiator ribs, it is of advantage to arrange the bristle tufts of the individual rows at a different inclination to one another.

As material for the cleaner nozzle any suitable materials may be used, either soft or hard materials, such as soft rubber, caoutchouc, hard rubber, Igelit, Trolitul and and the like. Hard substances will be found preferable in those cases where importance is attached to having a

rigid nozzle body which will not yield during the brushing operation, on a certain pressure being exerted. When the nozzle body is made of yielding material, more particularly of soft rubber, it will be possible to manipulate the nozzle in such a manner as to be able comfortably to reach with it the otherwise inaccessible places between the radiator ribs by bending the nozzle to the required extent around the ribs through exerting a certain amount of force. For this purpose it is only necessary to force the nozzle in the axial direction between the radiator ribs so as to cause this nozzle, owing to its flexibility, to adapt itself to the various curved spaces. This is of special importance in dealing with radiators, the ribs of which lie particularly close to one another.

Further details of the invention shall now be described with reference to the constructional example illustrated in the accompanying drawing, in which:

Fig. 1 shows a longitudinal section through the cleaner nozzle on line I—I of Fig. 2,

Fig. 2 is a longitudinal section turned through 90° and partial plan view on line II—II of Fig. 1,

Fig. 3 is a view into the rear orifice of the cleaner nozzle in the direction of the arrow A of Fig. 1,

Fig. 4 is a cross-section on the line IV—IV of Fig. 2, and

Fig. 5 is another constructional form, in which the tufts of bristles are arranged on only one of the flat sides of the nozzle.

According to the constructional form of Figs. 1 to 4 the cleaner nozzle consists of an elongated nozzle body of soft rubber, which in the rear part 1 is of tubular shape and has a marginal beading 2, so the cleaner nozzle can be slipped over the usual vacuum cleaner tube which is not shown in the drawing. Towards the front the cleaner nozzle is flattened off on each side to a flat part 3, as shown in Fig. 1. In the plane perpendicular to the flattened part the nozzle is, as shown in Fig. 2, made somewhat wider than corresponds to the diameter of the tubular part 1, as the parts 4 in Fig. 2 show. This widening is even still greater, as at the outer lateral narrow edges 5, 6 and at the front edge 7 an uninterrupted rib-like marginal beading 8 extends. At the two flat narrow sides or surface members 9 elongated slots or apertures 10 are provided, which extend over the greater part of the flat portion of the cleaner nozzle.

The hollow space 12 which at the rear orifice is at first circular narrows down forwards into a flat hollow space 13. The flat hollow space 13 is in the region, where the slots 10 are provided, broader than these slots, so that between the flat wall parts 14 inwardly open elongated hollow chamber or pocket spaces 15 are formed which terminate short of narrow edges 5, 6. These hollow spaces would not be absolutely necessary for the purpose of suction only, although they enlarge the cross-section of suction for the passage of the air, which is of importance in so far as the suction effect is relatively great owing to the elongated slots 10 and as large suction cross-sections as possible would naturally be provided for at this place in order to obtain a sufficiently high suction velocity in the slots themselves.

These narrow part spaces 15, however, have another very important advantage, namely, they increase the flexibility of the forward part of the cleaner nozzle. Should these part hollow spaces 15 not be provided, the cleaner nozzle would at these places be far less pliable.

Through the provision of the marginal rib 8 along the junction of the surface members 9, both the stiffness of the cleaner nozzle in the flat direction of the nozzle is increased and the scraping effect on the dust at acute, inaccessible angles is improved. With this relatively nar-

row rib it is easier to reach inaccessible places than if this rib were not provided.

At the terminals of the rib 8 where the two narrow edges merge into the shank part of the cleaner nozzle, there is provided on each side a suction bore 17, through which the dust which is stripped off by the rib 3 can be sucked away.

Around the two suction slots 10 there are provided, uniformly distributed, a fairly large number of bores 19, 20 in two rows, which terminate short of the part defining hollow spaces 15 and are intended for the reception of bristle tufts 19'. The inner row of bores 19 is so arranged that their axes 21 extend perpendicularly to the main surface 22 of the nozzle. The axes 23 of the outer bore 20, which are also arranged in a row, are inclined at an angle of 60° to the main plane of the cleaner nozzle.

In order to prevent when the cleaner nozzle is introduced into the hollow spaces between the ribs of the radiator, that the walls 14 of the nozzle bend towards one another to such an extent that the part spaces 15 close partly at the open side, that is at the sides facing one another, distancing bridging ribs or struts 25 are provided.

According to the constructional form of Fig. 5 both the bristles 19' and the suction aperture 10 may be arranged on only one flat side of the brush, neither a suction aperture nor bristles being provided on the other side. This modification represents an adaptation to special requirements, in which it is of the first importance to carry out the cleaning and removal of the dust by suction from only one flat side.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A cleaning nozzle for connection with the suction tube of a vacuum cleaner, comprising a pair of substantially flat elongated members made of flexible material and having two ends, said members being joined to each other along their longitudinal edges and at one of said ends and being provided with opposite flat surfaces spaced from each other, the other end being tubular and constructed for attachment to and communication with said suction tube, said flat surfaces of said members being each provided with a single and relatively wide slot extending centrally and lengthwise of the respective surface, oppositely disposed chambers in communication with said slots and extending transversely to the latter and centrally between said members and terminating short of said longitudinal edges thereof, a plurality of rows of bristles mounted in said surfaces of said members, respectively, and substantially completely surrounding the periphery of said slots, whereby during cleaning said members may be flexibly deformed to permit said bristles to be bent out of their normal position to contact otherwise inaccessible areas of an object, and a continuous outer marginal bead integral with the material and extending along said longitudinal edges at the junction of said members and along said one end, whereby during cleaning operation said bead serves to reinforce said members and acts as a leading scraping edge.

2. A cleaning nozzle for connection with the suction tube of a vacuum cleaner, comprising a pair of substantially flat and flexible elongated members bounded by longitudinal edges and terminating into two ends, said members being joined to each other along their longitudinal edges and at one of said ends and being provided with opposite flat surfaces spaced from each other, the other end of said members being tubular and constructed for attachment to said suction tube and communication with the latter, at least one of said surfaces of said members being provided with a single and relatively wide longitudinal slot extending centrally of said one surface, oppositely disposed chambers extending between said members in crosswise direction to and in communication with said slot, said chambers being aligned to each other and terminating short of said longitudinal edges, a plurality of rows of bristles mounted in said surfaces of said members, respectively, and positioned substantially completely around the periphery of said slots, whereby during cleaning said members may be flexibly deformed to permit said bristles to be bent out of normal position to contact otherwise inaccessible areas of an object, and spacer strut means extending between the walls of said members therewithin adjacent said slots, said strut means preventing said spaced members from collapsing toward each other upon bending.

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