Dec. 2, 1952 N. C. CUDDEBACK 2,619,669

SUCTION NOZZLE HAVING NOZZLE AREA CONTROL AND SURFACE AGITATING MEANS

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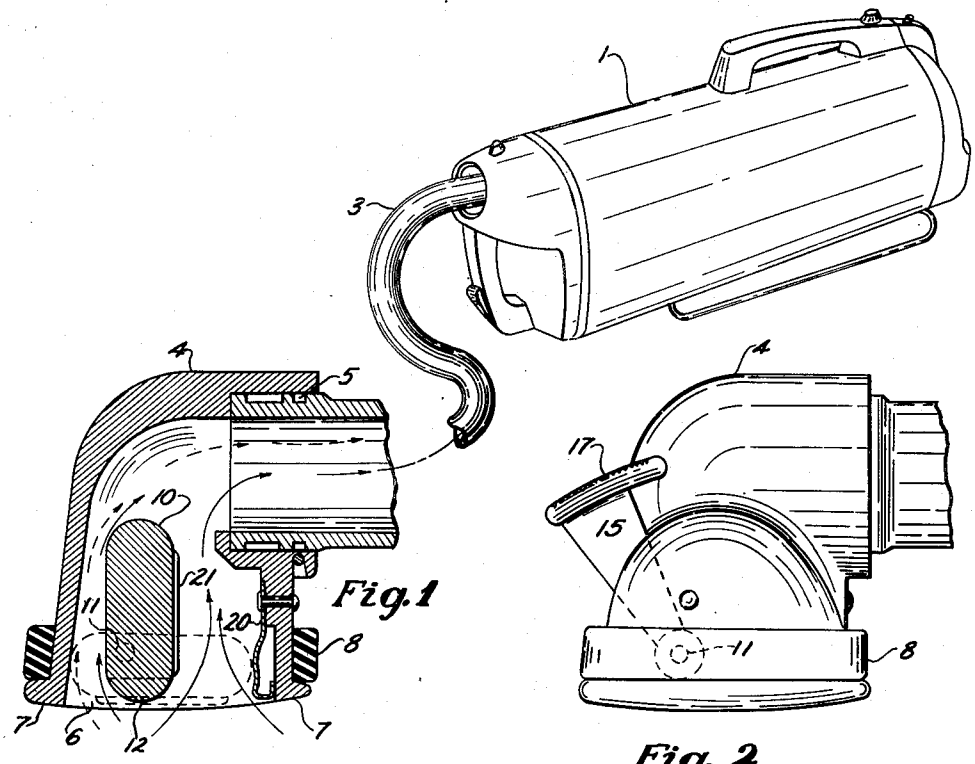


Fig. 1

Fig. 2

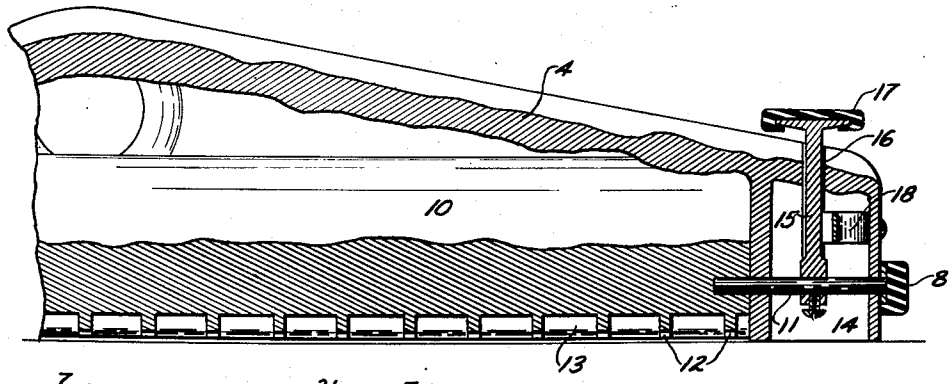


Fig. 3

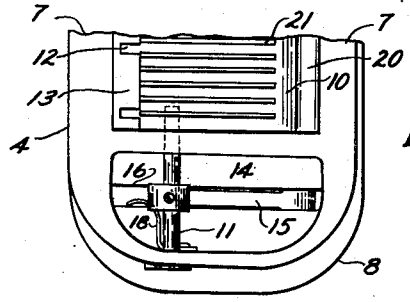


Fig. 4

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SUCTION NOZZLE HAVING NOZZLE AREA CONTROL AND SURFACE AGITATING MEANS

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2 Claims. (Cl. 15—365)

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My present invention relates to the art of suction cleaners and more particularly to a novel suction cleaning nozzle construction particularly adapted for use with types of apparatus in which the cleaning nozzle is attached to the end of a manipulatable suction hose or tube.

More particularly it is an object of my present invention to provide a surface cleaning suction nozzle provided with an element which presents combing devices to the surface being cleaned under all conditions of operation and which is selectively manipulable at the will of the operator to vary the effective size of the suction opening presented to the surface undergoing cleaning.

It is a further object of the present invention to provide a suction cleaning nozzle having an element mounted therewithin which in one position divides the interior of the nozzle in two cleaning air paths having a total cross-sectional area approaching the maximum area available within the nozzle structure and movable to a second position in which it restricts the air path through the cleaning nozzle to a single small area path.

Other objects and advantages of the invention will become apparent as the description proceeds when taken in connection with the accompanying drawing in which:

Figure 1 illustrates a suction cleaning apparatus embodying my invention with the nozzle construction thereof shown in section and drawn to an enlarged scale;

Figure 2 is an end elevational view of the nozzle construction of Figure 1;

Figure 3 is a partial front elevational view in section of the apparatus of Figure 2; and

Figure 4 is a bottom view of the apparatus of Figures 1 to 3.

Referring now to the drawing in detail there is illustrated a suction cleaning apparatus 1 of the so-called tank type to which is connected a long manipulatable suction hose 3 supporting a surface engaging cleaning nozzle body 4 upon its outer end.

The nozzle body 4 is elongated in a direction at right angles to the axis of the connection 3 and is provided with a socket 5 in which the end of the hose 3 is swiveled in a conventional manner. The interior of the nozzle body 4 is hollow to form an air path into the suction hose 3. The lower face of the nozzle body 4 is open to provide an elongated generally rectangular nozzle opening 6 which is defined by the nozzle lips 7 formed on the bottom portions of the walls

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of the nozzle body 4. A soft furniture guard, such as a rubber ring, 8 surrounds the nozzle body 4 adjacent the lips 7 to protect furniture or other objects against which the nozzle may be pushed in operation.

A selector or control valve element 10 is pivotally mounted within the nozzle 6 upon pivot pins 11 which are swiveled in the end walls of the nozzle body 4. The element 10 is in the form of a flat plate with rounded ends. The plate 10 is shaped to close the opening 6 by engaging the walls 7 with its edges when the plate lies with its flat face in the plane of the opening 6 as shown in Figure 4 and in dotted lines in Figure 1. One edge of the plate 10 is in the form of a plurality of spaced apart ribs 12 forming narrow air flow slots 13 therebetween.

The right hand end of the nozzle body 4, as viewed in Figure 3, is provided with an end chamber 14 through which the right hand pin 11 projects. An operating lever 15 is rigidly secured to the shaft 11 in chamber 14 and projects through a suitable slot 16 formed in the nozzle body 4. The outer, projecting end of the lever 15 carries a foot operated friction plate 17 by which the lever 15 can be rotated for a purpose to be described hereinafter. A snap spring element 18 secured to the nozzle body 4 is adapted to engage a side face of the lever 15 resiliently to retain the plate 10 in the position shown in Figures 1 and 3.

The plate 10 is also rotatable from the position shown in full lines of Figure 1 to the dotted line position shown therein. In the dotted line position, the rear end of the plate element 10 seals against the rear wall 7 to block air flow into the nozzle body 4 at this point. A leaf spring 20 resiliently retains the plate in the horizontal dotted line position of Figure 1. The slots 13 form the sole air inlets to the interior of the nozzle body 4 when plate 10 is in its horizontal position and constitute a high velocity cleaning nozzle structure of restricted area adapted to pick up material which resists the action of the normal cleaning nozzle. In the horizontal position of the plate 10, a comb forming ribs 21 on its lower face are brought into a plane slightly below the plane of the nozzle lips 7 in order to engage the surface being cleaned and to act as a comb thereon as the nozzle is moved back and forth in operation. The spaces between the ribs 21 also form passages for high velocity air jets leading to the slots 13 parallel to the surface being cleaned to aid the cleaning action.

In the position of the apparatus shown in Fig-

ures 1 and 3, the plate 10 has its flat faces positioned substantially vertically and the ribs 12 project substantially to the plane of the nozzle lips 7 to engage and comb a surface covering drawn into said nozzle during cleaning. The plate 10 is positioned internally of the nozzle structure and in spaced relation to the front and rear portions of the marginal lips 7 forms two air paths from the plane of the surface being cleaned into the nozzle body proper. Air flowing in the rear path sweeps the ribs 21, now vertically positioned, and any debris which may be adhering thereto. Because of the position of the comb element in an intermediate region between two cleaning air paths, the cleaning effectiveness of the device is appreciably increased. This results from the fact that carpet nap flexing forwardly ahead of the combing element and springing erect rearwardly thereof is in cleaning air paths so that any material even momentarily liberated from adherence to the carpet nap during either of these actions is immediately removed by the air stream. Material swept ahead of the comb element is pushed into an active cleaning air stream which results in a highly effective cleaning action.

The present nozzle is readily convertible from a normal large area low velocity nozzle to a small area high velocity nozzle construction by simple operation of the foot pedal 17 and is characterized in that the surface undergoing cleaning is subjected to a combing action under all conditions of operation of the nozzle construction.

While I have illustrated and described the invention in considerable detail, it is to be understood that various changes may be made in the arrangement, proportion and construction of parts without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A cleaning tool for suction cleaning apparatus comprising a hollow body portion adapted for connection to a source of suction, said body having spaced walls terminating in spaced surface engaging parts defining an opening forming a cleaning air inlet, a plate member having a perimeter conforming to said air inlet opening, means movably mounting said plate member for movement from a first position in which it extends across said air inlet opening with its edges engaging the inner surfaces of said walls with a flat side thereof lying substantially in the plane of said nozzle opening to a second position in which one edge of said plate lies substantially in the plane of said nozzle opening between said surface engaging parts and said flat side thereof is positioned at an angle to the plane of said nozzle opening, means forming a plurality of notches in said one edge of said plate, and a plurality of spaced ribs on said flat side of said plate member providing air flow channels and surface agitating means when said plate member is in said first position.

2. A cleaning tool for suction cleaning apparatus comprising a hollow body portion adapted for connection to a source of suction, said body having surface engaging parts defining an opening forming a cleaning air inlet, a control member movably mounted in said hollow body, said control member having an edge provided with a plurality of spaced ribs projecting therefrom and defining air flow slots therebetween and a flat face portion having a plurality of spaced elongated ridge members forming grooves therebetween, and means for selectively securing said member in a first position in which said member blocks the flow of air through said cleaning air inlet opening except through said slots and said ridge members are positioned substantially parallel to the plane of said surface engaging parts to engage a surface to be cleaned or in a second position in which cleaning air has a substantially unobstructed path of flow through said cleaning air inlet into said hollow body and said ribs are positioned to engage and agitate a surface to be cleaned.

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