July 31, 1951 T. E. D. BILDE 2,562,167

SUCTION NOZZLE WITH WORK-OPERATED VALVE

Filed Feb. 15, 1945

Fig. 1.

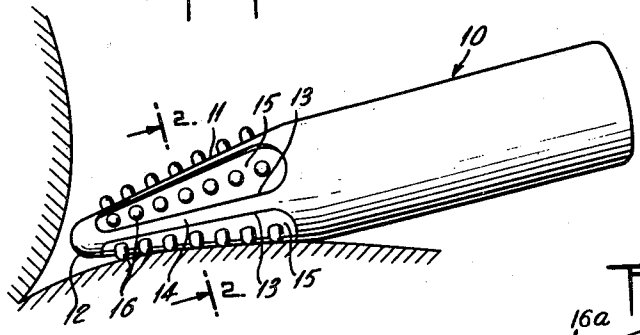


Fig. 3.

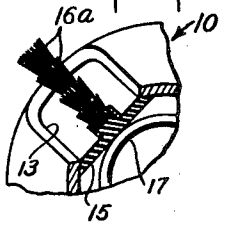
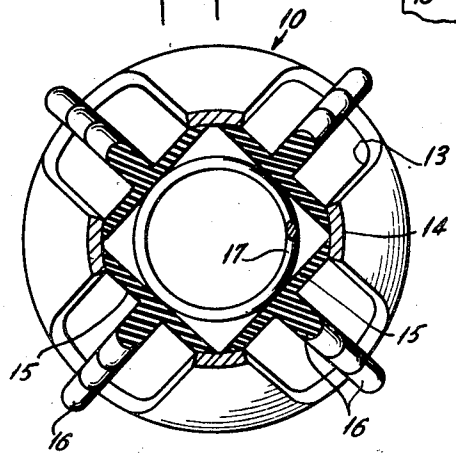


Fig. 2.



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SUCTION NOZZLE WITH WORK-OPERATED VALVE

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6 Claims. (Cl. 15—363)

1

This invention relates to suction nozzles, and more particularly to a nozzle adapted to be connected with the suction hose of a vacuum cleaner and used for removing dust and dirt from a surface.

An object of the invention is to provide a device of this character having a number of suction openings, which are closed by valve members provided with projecting parts, such as pins, ridges, bristles or the like, by means of which the valve members are adapted to be individually opened, and by means of which the surface to be cleaned is to be treated.

Further objects and advantages of the invention will be apparent from the following description, considered in connection with the accompanying drawing, which forms a part of this specification and of which:

Fig. 1 is a side view of a nozzle in accordance with my invention;

Fig. 2 is a cross-sectional view on an enlarged scale taken on the line 2—2 of Fig. 1; and

Fig. 3 is a cross-sectional view of a portion of a nozzle in accordance with another embodiment of my invention.

The nozzle is adapted to be connected with the suction conduit of a vacuum cleaner by means of a tubular connection member 10, which is adapted to serve as a handle when operating the nozzle. As illustrated in the drawing, the front end 11 of the nozzle tapers conically towards a rounded apex, so that the tapered nozzle portion, which is provided with a number of lengthened suction openings 13, is readily insertable into corners, which are otherwise difficult to get into, as for instance between back and seat cushions of a sofa, an easy-chair or the like. The suction openings 13, which are separated by rib-shaped portions 14 of the nozzle body, are closed from the inside by resilient walls 15, which may be forced inwardly and, when the nozzle is used, are individually opened when the nozzle is pressed against the object to be cleaned. Thus only the valve member or members 15, to which pressure is actually applied, will be opened. In order to facilitate the inward movement, the resisilient walls 15 of the embodiment shown are provided with a number of rubber pins 16, which, of course, may be substituted by tufts of bristles or the like 16a, as illustrated in Fig. 3, depending on the purpose for which the nozzle is intended. For the device shown in the drawing the walls 15, carrying the pins 16, may suitably be made from one moulding of rubber, which may, be manufactured in a tapered mould, conforming to the configuration of the nozzle portion 11, and be provided with longitudinal cuts at the portion intended to lie under the ribs 14. The elastic force of the walls 15 may then favourably be supported by internal spring members 17 of any suitable kind.

2

In view of the foregoing, it will now be understood that an improved suction nozzle has been provided in which the hollow body or tubular connection 10 is self-sustaining and defines a chamber arranged to be connected to a source of suction supply. In the substantially inflexible wall of the hollow body 10 are formed spaced apart apertures 13 which are distributed over a working region of the nozzle body and through which air and entrained foreign matter is drawn into the chamber by suction effect from the exterior of the body. The walls 15 serve as valve members for the apertures and the internal spring members 17 constitute resilient means for biasing the valve members to a substantially closed position.

The rubber pins 16 or bristles 16a may be referred to as agitating elements or feeler members which are adapted to contact a surface to be cleaned, such pins or bristles being depressed upon contacting such a surface and independently operable to open the valve member 15 associated therewith against the biasing action of the resilient means 17. Moreover, the pins 16 and bristles 16a project exteriorly of the body or tubular connection 10 to promote agitation of the surface to be cleaned when the valve members 15 are closed and also when the pins or bristles are depressed sufficiently to open the valve member associated therewith. It will be understood that each of the valve members 15 moves from its closed position a distance dependent upon the extent a feeler element associated therewith is depressed when contacting the surface being cleaned, thereby constantly varying the quantity of air drawn into the chamber through each aperture during manipulation of the body in a cleaning operation.

While one more or less specific embodiment of the invention has been described, it is to be understood that this has been done for the purpose of illustration only and that the scope of the invention is not to be limited thereby, but is to be determined by the appended claims.

What is claimed as new is:

1. A suction nozzle comprising a hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a substantially inflexible wall having spaced apart apertures distributed over a working region thereof and through which air and foreign matter therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, valve members for the apertures, resilient means for biasing the valve members to a substantially closed position, elements carried by the valve members for agitating a surface to be cleaned, the agitating elements being depressed upon contacting such a surface and independently operable to open the valve mem-

ber associated therewith against the biasing action of the resilient means, and the agitating elements projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the agitating elements are depressed sufficiently to open the valve member associated therewith.

2. A suction nozzle comprising a hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a wall having apertures distributed over a working region thereof and through which air and foreign matter contained therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, valve members for the apertures, resilient means for biasing the valve members to a substantially closed position, bristles carried by the valve member for agitating a surface to be cleaned, the bristles being depressed upon contacting such a surface and independently operable to open the valve member associated therewith even when the wall is out of contact with and not bearing against the surface to be cleaned, and the bristles projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the bristles are depressed sufficiently to open the valve member associated therewith.

3. A suction nozzle comprising a hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a substantially inflexible wall having apertures distributed over a working region thereof and through which air and foreign matter therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, valve members for the apertures, resilient means for biasing the valve members to a substantially closed position, means for stirring up foreign matter from a surface to be cleaned during manipulation of the body comprising bristles carried by said valve members, the bristles being depressed upon contacting such a surface and independently operable to open the valve member associated therewith against the biasing action of the resilient means, and the bristles projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the bristles are depressed sufficiently to open the valve member associated therewith.

4. A suction nozzle comprising a hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a substantially inflexible wall having slots or elongated apertures distributed over a working region thereof and through which air and foreign matter therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, elongated valve members for the apertures, resilient means for biasing the valve members to a substantially closed position, a plurality of elements carried by each valve member for agitating a surface to be cleaned, the agitating elements being depressed upon contacting the surface to be cleaned and independently operable to open the valve member associated therewith against the biasing action of the resilient means, and the agitating elements projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the agitating elements are depressed sufficiently to open the valve member associated therewith.

5. A suction nozzle comprising a hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a substantially inflexible wall having slots or elongated apertures distributed over a working region thereof and through which air and foreign matter therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, flexible elongated valve members for the apertures, resilient means for biasing the valve members to a substantially closed position, a plurality of elements carried by each valve member for agitating a surface to be cleaned, the agitating elements being depressed upon contacting a surface to be cleaned and independently operable to open the valve member associated therewith against the biasing action of the resilient means, and the agitating elements projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the agitating elements are depressed sufficiently to open the valve member associated therewith.

6. A suction nozzle comprising a self-sustaining hollow body defining a chamber having an opening adapted to be connected to a source of suction supply, the body including a substantially inflexible wall having spaced apart apertures distributed over a working region thereof and through which air and foreign matter therein is adapted to be drawn into the chamber from the exterior of the body by suction effect, valve members for the apertures, metallic resilient means for biasing the valve members to a substantially closed position, feeler elements for the valve members adapted to contact a surface to be cleaned, the feeler elements being depressed upon contacting such a surface and independently operable to open the valve member associated therewith against the biasing action of the resilient means, and the feeler elements projecting exteriorly of the body to promote agitation of the surface to be cleaned when the valve members are closed and also when the individual feeler elements are depressed sufficiently to open the valve member associated therewith, each of the valve members moving from its closed position a distance dependent upon the extent a feeler element associated therewith is depressed when contacting the surface to be cleaned, thereby constantly varying the quantity of air drawn into the chamber through each aperture during manipulation of the body in a cleaning operation.

TORD ERIK DANIEL BILDE.

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