

July 21, 1936.

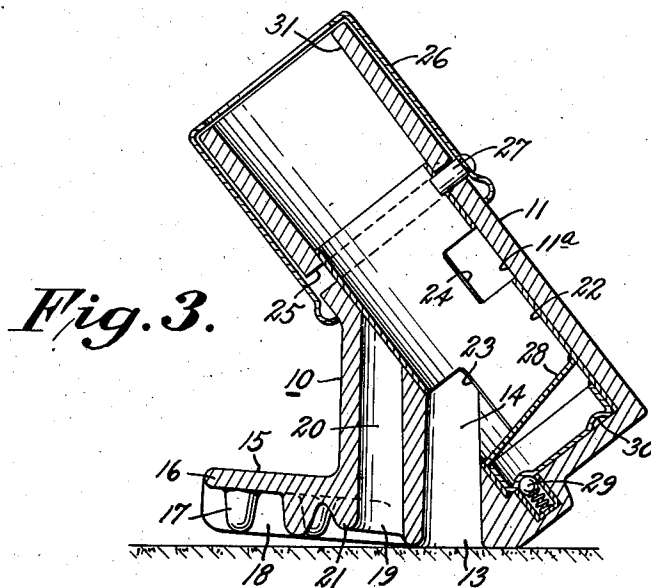
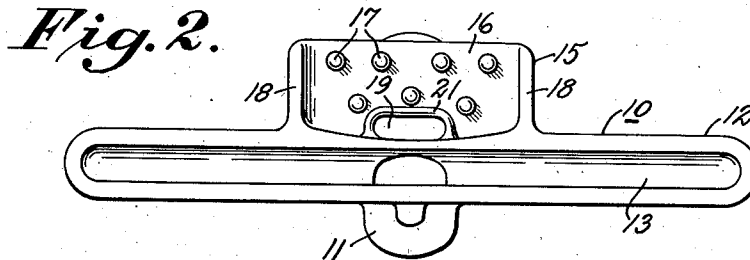
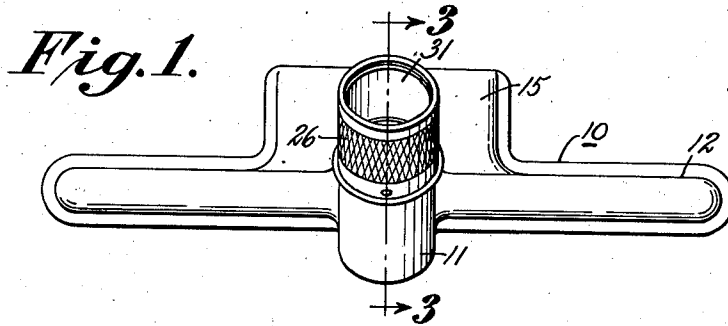
G. LJUNGQUIST

2,048,273

VACUUM CLEANER

Filed July 31, 1934

2 Sheets-Sheet 1



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Fig. 4.

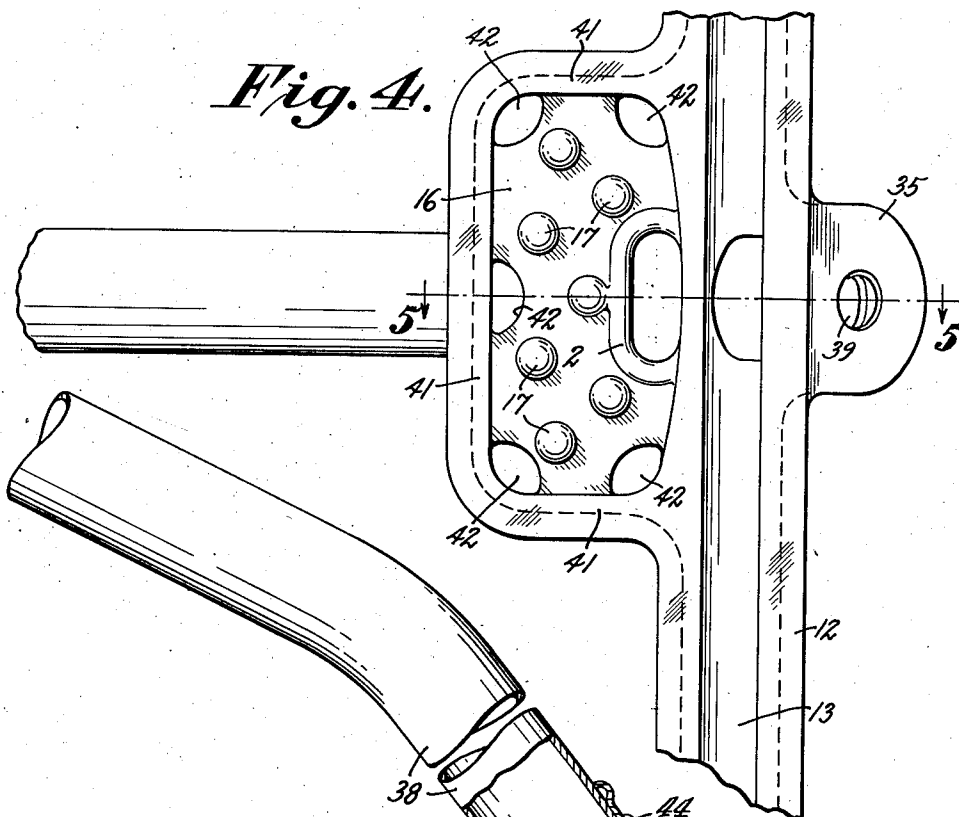
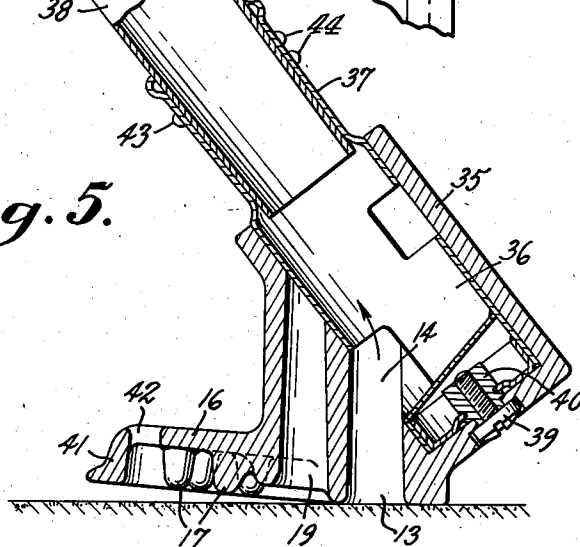


Fig. 5.



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VACUUM CLEANER

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13 Claims. (Cl. 15—155)

My invention relates to vacuum cleaners and particularly to cleaning implements or nozzles for use in connection therewith.

One of the objects of my invention is to provide a cleaning nozzle having an elongated mouth piece for the ordinary cleaning of rugs or the like and a small mouth piece adjacent thereto designed to give a high velocity of air flow in order to pick up threads, lint and the like which adhere to the surface being cleaned. The nozzle includes rotary valve means whereby either of these nozzles may be brought into operation by merely rotating the valve. In one embodiment of my invention this rotation is brought about by rotating the hollow handle which also serves as a suction conduit for the nozzle.

Another object of my invention is to provide an improved form of small nozzle wherein a plate surrounds the suction opening of the nozzle, the plate being provided with a plurality of downwardly extending projections, the purpose of which is to mechanically loosen threads and the like which may then be picked up by the high velocity air stream.

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

Fig. 1 is a top view of one embodiment of my invention;

Fig. 2 is a bottom view of the device shown in Fig. 1;

Fig. 3 is a cross-sectional view on an enlarged scale taken on the line 3—3 of Fig. 1;

Fig. 4 is a bottom view of another embodiment of my invention; and

Fig. 5 is a cross-sectional view, taken on the line 5—5 of Fig. 4.

Referring more particularly to Figs. 1 through 3, reference character 10 designates generally a nozzle which may be of cast or pressed metal construction. Nozzle 10 includes a cylindrical portion 11 formed with an internal bore 11a. Integral with cylindrical portion 11 is an elongated portion 12 forming an elongated mouth piece 13. Mouth piece 13 communicates with bore 11a by means of a channel 14. Underneath cylindrical portion 11 and behind the elongated portion 12 is a rectangular portion 15 which forms a small suction nozzle. Portion 15 comprises a plate 16 from the underside of which extends a plurality of knobs or similar projections 17. The ends of projections 17 are pref-

erably rounded. Ridges 18 extend downwardly from either end of plate 16 approximately the same distance as projections 17. A suction opening 19 is formed in plate 16 and communicates with bore 11a by means of a channel 20. A ridge 21 surrounds opening 19. This ridge does not extend downwardly as far as either projections 17 or ridges 18.

Rotatably mounted within bore 11a is a cylindrical valve member 22. Valve member 22 is formed with an opening 23 on one side thereof which, in certain positions of the valve member is in alignment with the inner end of channel 14 and permits communication between this channel and the interior of the bore. An opening 24 is formed in the other side of valve member 22 and so located that, when the valve member is rotated 180° from the position shown in Fig. 3, it registers with the inner end of channel 20, thus establishing communication between the small suction opening 19 and the interior of the bore. Cylindrical portion 11 is formed with a circumferential slot 25 which extends approximately 180°. A hand grasp member 26 is rotatably mounted on the outside of cylindrical portion 11 and is secured to valve member 22 by means of a rivet or the like 27 which extends through slot 25. Rivet 27 not only fastens these two members together but, in conjunction with the slot, prevents axial movement of either of them.

The lower end of valve member 22 is formed with a reinforcing member 28 which also serves to block off the lower end of the valve member and prevent the accumulation therein of dirt. A spring pressed detent 29 is provided in the lower end of cylindrical portion 11 and is adapted to engage oppositely positioned recesses 30 in the lower end of valve member 22. The detent in conjunction with the recesses serves to retain the valve member in the position shown in Fig. 3, or in the position with opening 24 in alignment with channel 20, while permitting rotation of the valve member when sufficient force is applied thereto to overcome the resistance of the detent.

The upper end of bore 12 is tapered slightly, as is shown at 31 in order to receive the tapered end of a suction conduit. This conduit is usually a rigid tubular member which also serves as a handle for moving the nozzle over the surface to be cleaned. The other end of the suction conduit is connected by suitable means, such as a flexible hose, to a vacuum cleaner which functions to produce a flow of air therethrough.

The operation of the above described nozzle is as follows:

With the valve member in the position shown in Fig. 3 and the nozzle connected to a suitable source of suction, air is drawn in through mouth piece 13, passage 14, valve member 22 and bore 11a. If the nozzle is passed over a dusty surface, this flow of air picks up the dust and carries it to the vacuum cleaner. Due to the length of mouth piece 13, a comparatively large area is cleaned by moving the nozzle back and forth thereover.

In the event that threads or other similar objects, which have a tendency to cling to the surface of a rug, are encountered it may be that the suction produced in the large mouth piece 13 is not sufficient to dislodge the threads. In order to remove them, hand grasp member 28 is turned through approximately 180°, thereby causing similar movement of valve member 22 which cuts off communication with the large nozzle and establishes communication with the smaller opening 19. Air is admitted underneath plate 16 at the rear side thereof and passes with high velocity toward the opening. The ridge 21 around the opening causes the air to have a still higher velocity just as it passes into the opening. If the nozzle is moved over the surface to which the threads are adhering, projections 17 will mechanically dislodge the threads and the high velocity air stream will pick them up and carry them to the vacuum cleaner. Ridges 18 act in the nature of runners and prevent the projections 17 from digging into the rug. The position of rivet 27 provides a convenient means for the operator to know which of the nozzle openings is in communication with the bore.

The modification shown in Figs. 4 and 5 are similar to that just described except that the cylindrical portion, here designated with reference character 35 is shorter in axial extent than was cylindrical portion 11. Valve member 36, on the other hand, is longer than valve member 22 and extends beyond the upper end of the cylindrical portion, as is shown at 37. Portion 37 of the valve member is slightly tapered so as to receive a suction conduit 38 which is preferably a rigid tubular handle member. Valve member 36 is retained within the cylindrical bore by means of a bolt 39 and associated nut 40.

The construction of the smaller nozzle in the embodiment shown in Figs. 4 and 5 is somewhat different than that shown in Figs. 1 through 3. Plate 16 is provided with a ridge 41 extending around its entire periphery. The plate is also provided with a plurality of holes 42 therethrough which permit the entrance of air to the space between the plate and the surface being cleaned.

The operation of this embodiment is as follows:

With the valve member 36 in the position shown in Fig. 5, the large mouth piece 13 is in communication with the source of suction connected to conduit 38. In the event that it is desired to use the small mouth piece, hollow handle member or conduit 38 is rotated through approximately 180°, thereby imparting a like motion to valve member 36. Hence, mouth piece 13 is cut off and communication is established with the opening 19 in the smaller mouth piece. The air now passes through openings 42 in plate 16 and passes over the surface being cleaned therebeneath. This air picks up threads and the like dislodged from the surface by projections 17. Portion 37 of valve member 36 may be provided with indicating means, such as two marks 44 on

one side thereof and one mark 43 on the other side to indicate which nozzle is connected to the bore.

In the event that the upper end of the hollow handle member 38 is curved, as is shown in Fig. 5 to provide a substantially horizontal portion to be held in the operator's hand, rotation of this member through 180° will change the inclination of the lower end of the member, and hence the inclination of the nozzle. In order to compensate for this change, the plane of the opening 13 in mouth piece 12 may be angularly disposed with respect to the plane of the opening 19 in mouth piece 16. This is clearly shown in Fig. 5. Hence, when the handle 38 is rotated, the nozzle will be tilted so that ridges 41 on plate 16 will be brought into contact with the surface to be cleaned and the forward lip of mouth piece 12 will be raised slightly from the floor. This arrangement has the additional advantage that, when one mouth piece is being used, the other is out of contact with the surface and hence does not offer any frictional resistance to the movement of the nozzle as a whole over the surface.

While I have shown and described two more or less specific embodiments of my invention, it is to be understood that this is for the purpose of illustration only and that the scope of my invention is to be determined by the appended claims viewed in the light of the prior art.

What I claim is:

1. In a cleaning implement, in combination, a housing formed with a cylindrical bore, means forming a large suction mouth piece communicating with said bore, means forming a small suction mouth piece communicating with said bore, a cylindrical valve member within said bore rotatable coaxially therewith to selectively cut off communication between the respective mouth pieces and the interior of said bore, and a cylindrical tubular member constituting a handle for said implement and communicating with said bore, the axes of said valve member and of said tubular member being in alignment.

2. In a cleaning device, a housing having a cylindrical bore, means forming a plurality of various sized suction mouth pieces communicating with said bore, a rotary valve member within said bore for selectively cutting off communication between the respective mouth pieces and said bore, and a tubular member concentric with and secured to said valve member, said tubular member being accessible outside said housing so as to be rotatable to rotate said valve member.

3. In a cleaning device, in combination, a housing having a cylindrical bore, means forming a large suction mouth piece below and communicating with said bore, means forming a small suction mouth piece beside the large mouth piece and communicating with said bore, a rotary valve in said bore for selectively cutting off communication between the respective mouth pieces and the interior of said bore, and a rigid conduit member secured in said valve member and adapted to be rotated to rotate said valve member.

4. In a cleaning device, in combination, a housing having a cylindrical bore, means forming a large suction mouth piece below and communicating with said bore, means forming a small suction mouth piece beside the large mouth-piece and communicating with said bore, the plane of the opening of one of said mouth-pieces being disposed at an angle with respect to the plane of the opening of the other mouth-piece, a rotary valve in said bore for selectively cutting off com-

munication between the respective mouth-pieces and the interior of said bore, and a rigid hollow handle member having one end secured in said valve member and adapted to be rotated to rotate said valve member, the other end of said handle member being angularly disposed with respect to the remainder of the member, the angles being such that, when said handle member is rotated to rotate said valve member, said housing is tilted through an angle approximately equal to the angle between the planes of the openings of the mouth-pieces.

5. In a cleaning device, a housing having a cylindrical bore, means forming a plurality of various sized suction mouth-pieces communicating with said bore, a rotary valve member within said bore for selectively cutting off communication between the respective mouth-pieces and said bore, a tubular hand grasp member rotatably mounted on the outside of the portion of said housing forming said bore and concentric with said valve member, and means connecting said hand grasp member to said valve member so that said members rotate together.

6. A suction nozzle including means forming a bore adapted to receive a suction conduit, a plate member rigid with respect to said means and having an opening therethrough communicating with said bore, a downwardly protruding rim extending completely around said opening, and a plurality of projections extending downwardly from said plate outside said rim.

7. A suction nozzle including means forming a bore adapted to receive a suction conduit, a plate member rigid with respect to said means and having an opening therethrough communicating with said bore, a downwardly protruding rim extending completely around said opening, a rim extending downwardly from at least a portion of the periphery of said plate, and a plurality of projections extending downwardly from said plate between said rims.

8. A suction nozzle including means forming a bore adapted to receive a suction conduit, a plate member rigid with respect to said means and having an opening therethrough communicating with said bore, a downwardly extending rim around said opening, a downwardly extending rim around the periphery of said plate, and a plurality of projections extending downwardly from said plate between said rims, said plate being formed with an aperture therethrough in the neighborhood of said projections.

9. In a cleaning device, in combination, means forming a cylindrical bore adapted to receive a

suction conduit, means forming a large suction nozzle to one side of and communicating with said bore, means forming a small suction nozzle on the same side of said bore and communicating therewith, and a valve member mounted in said bore and rotatable about the axis of said bore for selectively cutting off communication between the respective nozzles and said bore, and a cylindrical tubular handle member communicating with said bore, the axes of said valve member and of said tubular member being in alignment.

10. In a cleaning device, in combination, means forming a cylindrical bore, means forming a large suction nozzle to one side of and communicating with said bore, means forming a small suction nozzle on the same side of said bore and communicating therewith, a valve member mounted in said bore and rotatable about the axis of said bore for selectively cutting off communication between the respective nozzles and said bore, and a hollow handle member forming a suction conduit engageable with said valve member and rotatable to rotate the valve member.

11. A suction nozzle including means forming a bore adapted to receive a suction conduit, a plate member rigid with respect to said means and having an opening therethrough communicating with said bore, a downwardly extending rim around said opening, and a plurality of projections extending downwardly from said plate outside of said rim and spaced from each other so as to provide passageways therebetween for flow of air toward said rim, said air passing under said rim and through said opening.

12. A suction nozzle including means forming a bore adapted to receive a suction conduit, a plate member rigid with respect to said means and having an opening therethrough communicating with said bore, a downwardly extending rim around said opening, and a plurality of spaced knobs projecting downwardly from said plate outside of said rim.

13. In a cleaning device, means forming a bore adapted to receive a suction conduit, means forming a large suction nozzle to one side of and communicating with said bore, means forming a smaller thread picking suction nozzle on the same side of said bore and communicating therewith, and a valve means for selectively cutting off communication between the respective nozzles and said bore, said nozzles having surface contacting portions lying in angularly disposed planes whereby only one of said portions contacts a surface at a time.

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