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SUCTION NOZZLE

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Our invention relates to suction nozzles and more particularly to a suction nozzle for use with a vacuum cleaner.

In cleaning in confined spaces and on curved and irregular surfaces, it is frequently necessary to use only a portion of the suction nozzle for cleaning a relatively small area.

In accordance with our invention, an improved suction nozzle is provided which will clean as efficiently when only a portion of the suction nozzle is used as when the whole nozzle is utilized.

What we consider to be novel and our invention may be better understood by reference to the following specification and appended claims when considered in connection with the accompanying drawing, in which—

Fig. 1 is a top view of the improved nozzle;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a bottom view; and

Fig. 4 is a sectional view taken along the lines 4—4 of Fig. 1.

Referring to the drawing, 10 indicates a body member in the form of a stamping having a chamber 11 adapted to communicate with a source of suction through a connection member or sleeve 12. Sleeve 12 is secured within an opening 13 in the body member 10 as by means of welding. A base plate 14 is provided with a curved suction opening 15 communicating with chamber 11 through a passage 16. Base plate 14 is preferably formed of a substantially rigid non-metallic material such as a phenolic condensation product but other material may be used. Around the periphery of plate 14, a smooth lip 17 is provided, arched transversely and forming a plane contact surface for base 14. Base 14 has a pointed end 18 where a passage 19 is provided in the lip 17. An inner lip 20 extends around the suction opening 15 and is spaced inwardly from the plane of lip 17, as best indicated in Figs. 2 and 4.

Body 10 and plate 14 are secured together by means of a strap 21 which is connected to sleeve 12 at one end by soldering or welding, and to the base 14 at the other end by a rivet 22. Strap 21 is seated in a recessed portion 23 in plate 14 so that no exposed portion of strap 21 will be in the path of air flow through chamber 11 which would produce turbulence. Engagement between strap 21 and shoulders 24 at the sides of recessed portion 23 prevents twisting of body member 10 with respect to base 14. Positioning of the body member 10 on base 14 is accomplished by the lo-

cation of strap 21 in recessed portion 23 and by engagement of a flange 25 extending around the bottom edge of body 10 with a shoulder 26 of base 14. Channels 27 in plate 14 provide passages communicating with the atmosphere at the rear of base 14 and with the suction opening 15 across the lip 20. A central tongue 28 extends outwardly from the base 14 to a plane substantially coincident with the plane of lip 17. Tongue 28 prevents light material, such as curtains, when being cleaned, from sealing across the lips 17 and 20 and closing the passages formed by the channels 27. The channels 27 are progressively reduced in cross-sectional area at their ends adjacent passage 16, as best indicated in Fig. 2, to more evenly distribute the air flow from channels 27 across lip 20. Also in Fig. 2 it may be noted that the thickness of the base 14 is reduced at 29 adjacent passage 16 to increase the cross-sectional area of the air flow path at the point where the walls of body 10 and base 14 converge to the pointed end 18.

A baffle plate 30 is secured to the inner end of sleeve 12 to prevent eddies between sleeve 12 and body 10 which tend to produce noise.

In use the nozzle is connected to a source of suction by inserting a hose end or suction conduit in the sleeve 12. The force necessary to move the nozzle about on a surface being cleaned is transmitted from the suction conduit by the sleeve 12 and strap 21 to the base 14.

In cleaning a relatively flat surface, such as a rug or the seat of an upholstered chair, the whole area of the base 14 is placed in contact with the surface being cleaned. The nozzle may be moved forwardly and backwardly or from side to side or in any direction most convenient for cleaning the particular surface. By moving the nozzle from side to side, a larger area can be covered with a single stroke. In a confined space, such as the corner of an upholstered chair, in which the whole of the nozzle cannot be inserted, the pointed end 18 is inserted therein, and due to the concentration of the suction adjacent the pointed end by virtue of the proximity of the passage 16, communicating with the chamber 11, a very efficient cleaning action is obtained.

When it is necessary to clean a curved or irregular surface which does not have any flat area sufficiently large for the whole of the base 14 to contact, the surface may be cleaned simply by placing the pointed end of the base 14 in contact with the surface to be cleaned. If the passage 16 were extended throughout the whole length of the suction opening 15, there would be

a great reduction in the suction due to the relatively free passage of the air into the uncovered portion of the suction opening 15. Thus, by this arrangement, it is possible to maintain the suction at a relatively high value without the necessity of placing the whole area of the base in contact with the surface being cleaned. The tongue 28 prevents any light fabric, such as a curtain or portière, being drawn into the channels 27 and sealing directly across the lips 17 and 20. This insures a free passage for the air from the rear of the base 14 through the passages formed by the channels 27 into the suction opening 15 across the inner lip 20. The passage 19 in the lip 17, at the pointed end 18, further insures a highly efficient cleaning ability at the pointed end by permitting a large flow of air at this point which is particularly useful when working in small spaces. The baffle 30 prevents eddies being formed by the flow of the air through the chamber 11, across the sharp edges of the sleeve 12, which would produce considerable noise without performing any useful function. Such eddies also tend to reduce the flow of air by interference therewith. By transmitting the force for moving the nozzle from the sleeve 12 directly to the base 14 through the strap 21, the body 10 is relieved of all strain and may be formed of relatively thin gauge metal in any shape desired for the sake of appearance and convenience.

The assembly of the body 10 and base 14 is accomplished by positioning the body 10 on the base 14 with the strap 21 located in the recessed portion 23 and flange 25 in engagement with shoulder 26 and inserting the rivet 22.

What we claim is:

1. A suction nozzle including a body member having a chamber, a connection member for said body member communicating with said chamber, a plate of substantially oval shape secured to said body member having a passage communicating with said chamber, a smooth lip extending outwardly from the periphery of said plate and forming a flat contact surface, a second smooth lip extending from said plate parallel to and defining with said first-named lip a suction opening communicating with said passage, and a channel in said plate communicating with the atmosphere at one end of said plate and across said second lip with said passage at the other end.

2. A suction nozzle including a body member having a central chamber, a connection member communicating with said chamber adapted for connection to a source of suction, a base of substantially oval shape having a curved suction opening adjacent the edge of the base communicating with said chamber through a passage in the base, a lip extending along the periphery of the base adjacent to said suction opening, a second lip extending along the inside of said suction opening, said base having a passage communicating with the atmosphere at one end and across said last-mentioned lip with said first-named passage at the other end, and a centrally located tongue extending outwardly from the base beyond said last-named lip.

3. A suction nozzle including a body member having a chamber, a sleeve secured to said body member adapted to receive a suction conduit and communicating with said chamber, a base plate of substantially oval shape secured to said body member having a passage at one end only communicating with said chamber, a lip extending along the periphery of said base plate and form-

ing a flat contact surface, a second lip spaced inwardly from the plane of said first-named lip and defining therewith a suction opening communicating with said passage, said base having a channel communicating with the atmosphere at the end of said base remote from said passage and with said suction opening across said last-named lip, and a tongue extending from said base plate spaced from said second lip and having a surface in the plane of the contact surface of said first-named lip.

4. A suction nozzle including a body member having a chamber, a sleeve secured to said body member communicating with said chamber, a strap connected to said sleeve, a base plate secured to said strap having a passage communicating with said chamber, a lip extending outwardly along the periphery of said base plate forming a flat contact surface, an inner lip extending outwardly from said base plate and terminating short of the plane of said outer lip, said base plate having a suction opening between said first-named lip and said inner lip communicating with said passage, and a tongue extending from said base plate spaced from said inner lip having a contact surface in the plane of said first-named lip, said base plate having a channel communicating with the atmosphere at one end of the base plate remote from said passage and with said suction opening across said inner lip.

5. A suction nozzle including a hollow body member, a sleeve secured to said body member and communicating with the interior of the body member, a flange extending outwardly around the periphery of the body member, a base plate having a recessed portion and a shoulder extending around its periphery, a strap connected to said sleeve and secured in said recessed portion of said base, said flange engaging said shoulder, a lip extending outwardly along the periphery of said base forming a flat contact surface, and an inner lip spaced from said last-named lip defining therewith a suction opening, said base plate having a passage at one end communicating with said suction opening and the interior of said body member, said base plate having a channel extending from the end remote from said last-named passage and communicating with said suction opening across said inner lip.

6. A suction nozzle including a hollow body member, a sleeve secured to said body member and communicating with the interior of the body member, a flange extending outwardly around the periphery of the body member, a base plate having a recessed portion and a shoulder extending around its periphery, a strap connected to said sleeve and secured in said recessed portion of said base, said flange engaging said shoulder, a lip extending outwardly along the periphery of said base forming a flat contact surface, an inner lip spaced from said last-named lip defining therewith a suction opening, said base plate having a passage at one end communicating with said suction opening and the interior of said body member, said base plate having a channel extending from the end remote from said last-named passage and communicating with said suction opening across said inner lip, and a tongue extending outwardly from said base plate and positioned centrally thereof.

7. A suction nozzle including a body member having a central chamber, a sleeve extending within said body member and communicating with said central chamber, a baffle plate secured

to the inner end of said sleeve closing the space between said sleeve and said body member, a base plate having a recessed portion and a shoulder around its periphery, a strap connected to said sleeve and secured in said recessed portion of said base plate, a flange extending around the periphery of said body member and engaging the shoulder of said base plate, said base plate having a suction opening communicating through a passage at one end of said base plate with the central chamber of said body member, a lip extend-

ing along the periphery of said base plate adjacent said suction opening, an inner lip extending along said suction opening, said base plate having a channel communicating with the atmosphere at the end remote from said passage and communicating with said suction opening across said inner lip, and a tongue extending centrally from said base plate outwardly beyond said inner lip. 5

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