

C. L. GOUGHNOUR.
 SUCTION NOZZLE.
 APPLICATION FILED MAY 10, 1911.

1,039,383.

Patented Sept. 24, 1912.

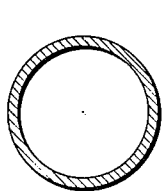
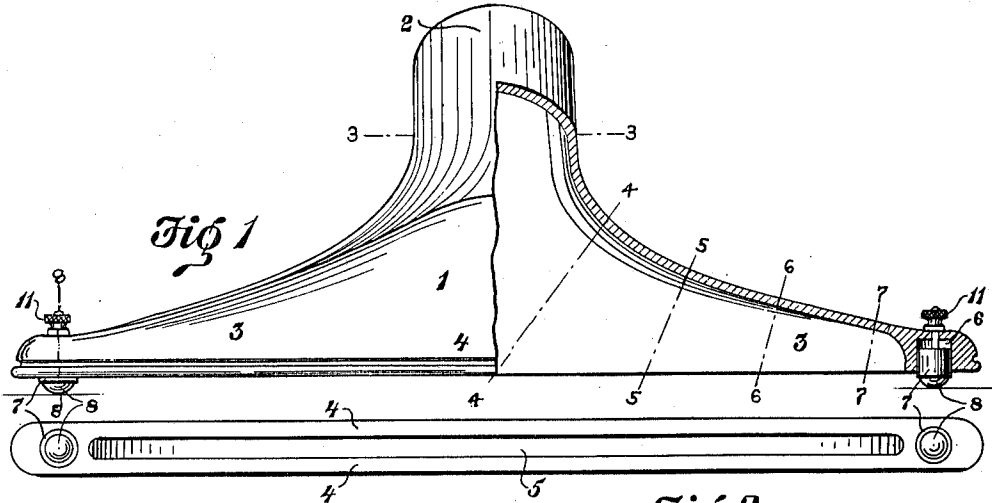


Fig 3

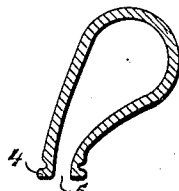


Fig 4

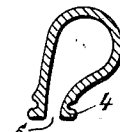


Fig 5



Fig 6



Fig 7

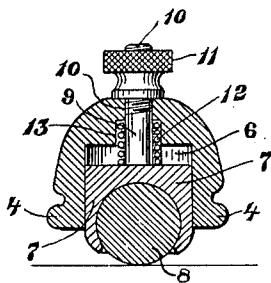


Fig 8

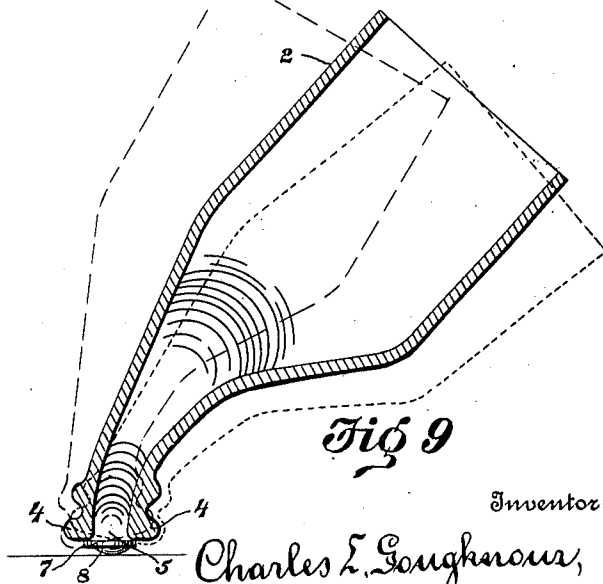


Fig 9

Witnesses
R. H. Kohl
Ruth W. Miller

Inventor
 Charles L. Goughnour,
 By *Harry Freese*
 Attorney

UNITED STATES PATENT OFFICE.

CHARLES L. GOUGHNOUR, OF CANTON, OHIO, ASSIGNOR TO THE UNITED ELECTRIC COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

SUCTION-NOZZLE.

1,039,383.

Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed May 10, 1911. Serial No. 626,356.

To all whom it may concern:

Be it known that I, CHARLES L. GOUGHNOUR, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Suction-Nozzles, of which the following is a specification.

The invention relates to intake nozzles for suction cleaning machines, and particular features pertain to nozzles for cleaning hard wood, cement and other impervious floors and surfaces; and the general objects of the improvement are to provide means for securing a constant suction throughout the cavity of the nozzle and the length of the intake slot, and to provide means for varying the interval between the respective lips of the slot and the impervious floor or surface.

In this class of work, it is desirable to keep the lips of the nozzle near to but not in contact with the surface to be cleaned, so that dust and dirt can be freely drawn under the lips into the mouth of the nozzle; which interval between the lips and the surface renders it desirable, if not necessary, that the suction shall be uniform throughout the length of the slot, so that the whole extent of the same will be equally efficient. And it is also desirable that the lips on opposite sides of the slot shall be held, either at the same distance from the surface, or that this distance shall be varied at will for the opposite lips to suit the exigencies of the work. For instance, if the nozzle is approaching a considerable accumulation of sand or dust, it is desirable, if not necessary, that the lip on the corresponding side of the slot shall be raised to increase the interval between the lip and the floor for increasing the volume of air and more readily receiving the material, and that the lip on the other side of the slot shall be depressed to lessen the corresponding interval, thus creating a greater volume of suction from the side which is doing the greater work.

These general objects, and other ancillary advantages, are attained by shaping the cavity of the nozzle with a regularly decreasing cross area inversely proportioned to the area of one-half the common shank opening, and the distance from the median line; and by providing a spring cushioned adjustable roller bearing of less diameter

than the width of the lips in each lateral end of the nozzle in alinement with the slot opening thereof; all as illustrated for a preferred embodiment of the invention, in the accompanying drawing, forming part hereof, in which—

Figure 1 is a front elevation of a suction nozzle with one lateral end in section to show details of construction; Fig. 2, an under side plan view of the nozzle; Fig. 3, a transverse section of the shank of the nozzle as at line 3—3, Fig. 1; Figs. 4, 5, 6 and 7, cross sections as on lines 4—4, 5—5, 6—6, and 7—7, Fig. 1; Fig. 8, a section on line 8—8, Fig. 1; and Fig. 9, a longitudinal section through the shank of the nozzle, showing in broken and dotted lines the forward and rearward tilted positions thereof.

Similar numerals refer to similar parts throughout the drawing.

The nozzle 1 is preferably made of metal with the hollow or tubular shank 2, from which the nozzle is flattened in its depth, and extended laterally to form the ends 3 and the straight parallel lips 4 with the intervening elongated narrow intake slot 5, the opening area of which is substantially the same as the cross area of the opening in the shank.

The cavity of the nozzle is shaped so that each lateral half is substantially of the same cross area from the shank, (as shown in Fig. 3 for line 3—3, Fig. 1), to the cross section of each lateral half passing through the median line of the slot, (as shown in Fig. 4 for line 4—4, Fig. 1); and from such median-line section the cross area of the cavity regularly decreases in proportion to the distance thereof from the median line, (as shown in Figs. 5, 6 and 7 for lines 5—5, 6—6 and 7—7, Fig. 1); so that the cross area of the cavity at any given point is substantially equal to the area of the slot opening beyond said point. This shaping of the cavity of the nozzle not only insures a substantially uniform suction or velocity of the air through the intake slot throughout its length, but also insures a steady and substantially constant movement or velocity of the air currents throughout all parts of the cavity of the nozzle, and prevents any eddying or irregularities in speed of the air currents, and the consequent separation and settling of the dust, in any part of the nozzle cavity. This shaping of the nozzle

also avoids the consumption of unnecessary power in drawing air from the ends of the tool through any relatively constricted area in the cavity of the nozzle.

- 5 The socket 6 is provided in each lateral end of the nozzle, in which is located the bearing 7 for the roller, which is preferably in the form of the ball 8 and normally protrudes from the lower end of the bearing.
- 10 The roller bearing furnishes an antifriction support for the nozzle, and holds the lips from abrading the floor. The bearing stem 9 extends upward through the aperture 10 in the nozzle wall, on the upper side of
- 15 which is located the adjusting nut 11 by means of which the bearing may be drawn upward against the action of the coil spring 12 located around the stem in the socket and the extension 13 provided therefor in the
- 20 wall of the nozzle.

- The arrangement of the parts and the resilience of the spring are such that the roller bearing protrudes below the lips of the nozzle to such distance as is permitted by the
- 25 adjustment of the nut, against the pressure of the weight of the nozzle and the normal thrust given by the operator; but that by an increased thrust by the operator the ball bearing may be forced into its socket,
- 30 against the resistance of the spring, to bring the lips of the nozzle nearer to the surface being cleaned; thus controlling at will the amount or volume of air which can enter the slot under both lips of the nozzle. Fur-
- 35 thermore the roller bearings are located in alinement with the slot, and are made less in diameter than the width between the outer edges of the lips, so that the nozzle may be tilted or oscillated on the bearings

to bring either one lip or the other of the nozzle nearer to, and the other lip farther from, the surface to be cleaned; thus controlling at will the relative volume of air which may enter the slot under either lip of the nozzle.

I claim:

1. A suction cleaning nozzle having a substantially equal area in the opening of its shank and the intake slot, and having the cavity of each lateral half shaped with a substantially constant cross area from the shank to the median line of the intake slot, and thence with a regularly decreasing cross area inversely proportioned to the distance from the median line, so that the cross area at any given point is substantially equal to the area of the slot opening beyond said point.

2. A suction cleaning nozzle having parallel lips forming an intake slot, with normally-protruding spring-cushioned roller bearings at the ends of the slot and in alinement therewith, the bearings being of less diameter than the width of the lips, whereby the lips can be alternately oscillated to and from the cleaning surface.

3. A suction cleaning nozzle having parallel lips forming an intake slot, with normally-protruding roller bearings at the ends of the slot and in alinement therewith, the bearings being of less diameter than the width of the lips, whereby the lips can be alternately oscillated to and from the cleaning surface.

CHARLES L. GOUGHNOUR.

Witnesses:

R. F. KOHL,
RUTH A. MILLER.