

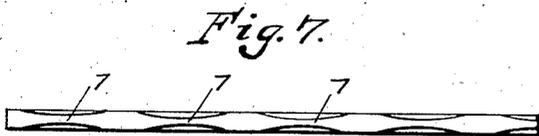
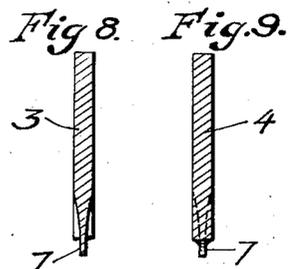
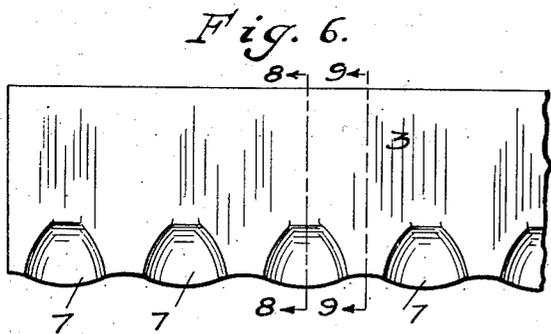
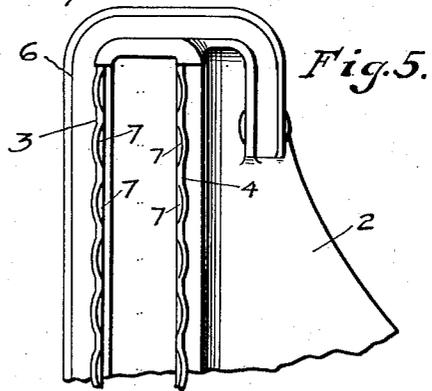
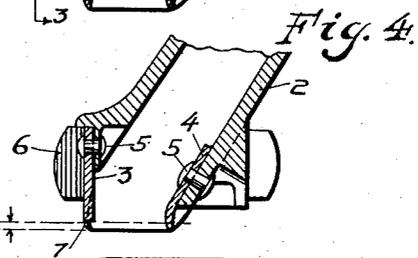
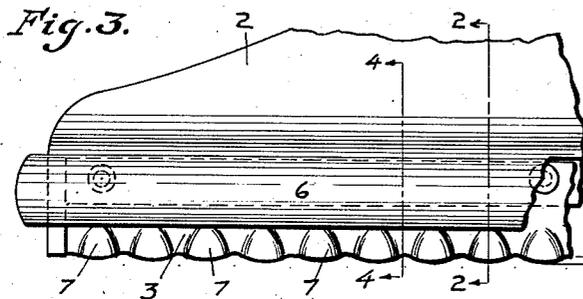
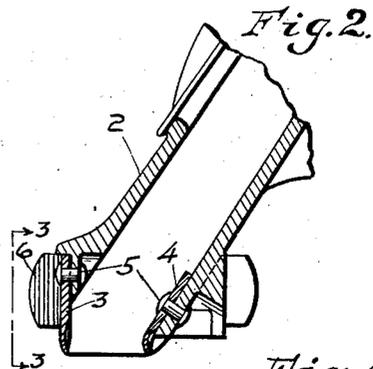
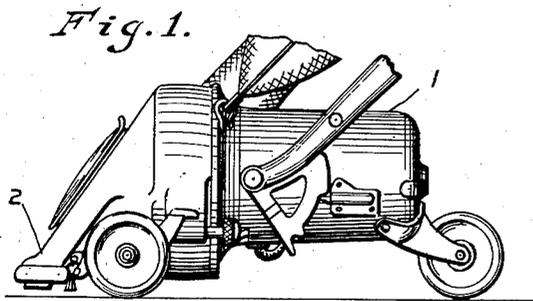
May 9, 1933.

D. G. SMELLIE

1,908,069

SUCTION CLEANER

Filed Oct. 22, 1931



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# UNITED STATES PATENT OFFICE

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## SUCTION CLEANER

Application filed October 22, 1931. Serial No. 570,291.

The present invention relates to suction cleaners in general and particularly to a new and improved suction cleaner nozzle. More specifically the invention comprises the provision of a nozzle in a suction cleaner which is scientifically designed to increase the cleaning effectiveness of the cleaner, it being provided with a surface-contacting portion which effects a pile agitation.

It is an object of the present invention to provide a new and improved suction cleaner nozzle. It is a further object to provide a suction cleaner nozzle comprising a new and improved surface-contacting portion. A still further object is the provision, in a suction cleaner, of surface-contacting portions which define the nozzle mouth and which are shaped to effect pile agitation through being greatly reduced in thickness in certain portions and which are provided with other portions of greater thickness to prevent excessive pile penetration by the lip. Still another object of the present invention is to provide a swaged pile-penetrating lip in a suction cleaner. Other objects will be apparent from the following specification and claims.

In the drawing, in which a preferred embodiment of the present invention is disclosed:

In Figure 1 is disclosed a side view of a suction cleaner of a modern type in which the present invention is embodied.

Figure 2 is a partial section of the nozzle of the machine shown in Figure 1, being taken upon the line 2—2 of Figure 3.

Figure 3 is a view upon the line 3—3 of Figure 2.

Figure 4 is a partial section upon the line 4—4 of Figure 3.

Figure 5 is a partial bottom plan view of the nozzle shown in Figures 2, 3, and 4.

Figure 6 is a partial front view of a second embodiment of the present invention.

Figure 7 is a partial bottom view of the nozzle lip shown in Figure 6.

Figure 8 is a section upon the line 8—8 of Figure 6.

Figure 9 is a section upon the line 9—9 of Figure 6.

Referring again to the drawing in Figure

1 a modern suction cleaner is disclosed which is indicated generally by the reference character 1 and which comprises all the parts found in the usual modern suction cleaner of which only the nozzle 2 need be mentioned for the purposes of disclosing the present invention. Nozzle 2 is, as in the usual modern suction cleaner, provided with a surface-contacting portion which is known in the art as the nozzle mouth and which, in the nozzle construction in accordance with the present invention, is defined by front and rear nozzle lips, indicated in the drawing by the reference characters 3 and 4. Inasmuch as the nozzle 2 is generally cast and formed of material such as aluminum, it is desirable that the surface-contacting nozzle lips be formed of a material which is of greater strength and less abrasive in its inherent characteristics. The nozzle lips 3 and 4, therefore, are formed of a material different from the nozzle proper 2 such as steel and are suitably connected to the lower edge of the nozzle proper by means of connecting rivets 5, 5 etc. As in the usual cleaner construction a furniture guard, which is indicated by the reference character 6, encloses the lower end of the nozzle for the purpose of protecting articles of furniture with which the said nozzle may come in contact but the presence or absence of this element plays no part in the present invention.

In the nozzle lips constructed in accordance with the present invention the lower edges or sides of the surface-contacting nozzle lips 3 and 4 are swaged on one side at closely spaced intervals, so as to form scallops, as indicated by the reference characters 7, 7 etc., the swaging having the effect of extruding downwardly in smooth curves immediately at the point of the swaging, a surface-contacting lip portion of reduced thickness. These portions 7, 7, as is clearly evidenced in Figure 3, extends below the normal lower edge of the lip and are of a lesser thickness than the lips, as is clearly seen in Figure 4, and also Figure 5.

In the second embodiment of the present invention, shown in Figures 6 to 9 inclusive, the nozzle lip is also swaged at its lower sur-

face-contacting edge or side but the construction differs from that shown in Figures 2 to 5 inclusive in that the swaging is effected upon both sides of the lip and the resulting construction produced is that clearly shown in the figures, the swaged portions 7, 7 being of reduced thickness as in the first embodiment and extending below the normal lower edge of the lips.

10 In the operation of a suction cleaner provided with a nozzle in which the surface-contacting lips are constructed in accordance with the present invention, upon the movement of the nozzle to and fro upon the surface covering, said covering being lifted into contact with the said lips by the action of the suction-creating fan creating a reduced pressure within the nozzle, the lips perform a new and extremely useful pile-penetrating and agitating function. The lifted surface covering is drawn against the nozzle lips and the relatively thin swaged portions 7, 7 of the lips enter the pile of the surface covering extending between adjacent tufts of said pile and in fact between the adjacent fibres of a single tuft. This penetration of the lip results in the relative movement between the adjacent fibres of a single tuft and the adjacent tufts when the cleaner is moved across the surface covering. The pile is flexed and the embedded foreign matter is dislodged and carried away by the cleaning air which enters under the nozzle lip and which is directed immediately to the point of the embedded dirt by the lip which extends into the covering. In the pile penetrating lip constructed in accordance with the present invention, the very desirable limited penetration of the lip is obtained. The swaged portions of the lip being thinner than the remainder of the lip enter the pile of the surface covering substantially unhindered until the lip has extended into said pile such a distance that the unswaged body of the lip contacts the top of the pile. Thereafter penetration of the covering must be by this unswaged part of the lip which, being of greater thickness, is less able to penetrate and so performs the function of definitely limiting the penetration of the portions of reduced thickness. This result is very desirable as it is the observation of users of the cleaner that excessive pile penetration by the lips results in an undue force requirement for the movement of the machine across the surface covering undergoing cleaning.

I claim:

1. In a suction cleaner, a suction nozzle including a rigid surface-contacting lip provided with spaced downwardly extended surface-contacting portions having a thickness less than the unextended portions.
2. In a suction cleaner, a suction nozzle including a surface-contacting lip provided with alternating surface-contacting portions

which are thick and thin relative to each other, characterized by the fact that said thin portions extend below said thick portions.

3. In a suction cleaner, a suction nozzle including a lip formed at its surface-contacting edge with spaced portions of lesser thickness than the portions of said lip therebetween.

4. In a suction cleaner, a suction nozzle including a lip formed at its surface-contacting edge with spaced portions of lesser thickness than the portions of said lip therebetween, characterized by the fact that said portions of lesser thickness extend below the thick portions in smooth curves.

5. In a suction cleaner, a suction nozzle, a nozzle lip carried by said nozzle formed of a harder metal than that used in said nozzle and which is hard, non-brittle and of great density, said lip being formed with downwardly extending laterally spaced, surface-contacting portions which are thinner than the normal lip thickness.

6. In a suction cleaner, a suction nozzle, a scalloped surface-contacting nozzle lip carried by said nozzle, the scallops being of lesser thickness than the portions of the lip therebetween.

7. In a suction cleaner, a suction nozzle, a scalloped surface-contacting nozzle lip carried by said nozzle, the scallops being of lesser thickness than the portions of the lip therebetween and extended therebelow.

8. In a suction cleaner, a suction nozzle, a surface-contacting lip on said nozzle provided with alternating portions which are thick and thin relative to each other, characterized by the fact that said thin portions extend below said thick portions and have opposed concave sides.

Signed at North Canton, in the county of Stark, and State of Ohio, this 13th day of October A. D., 1931.

DONALD G. SMELLIE.