

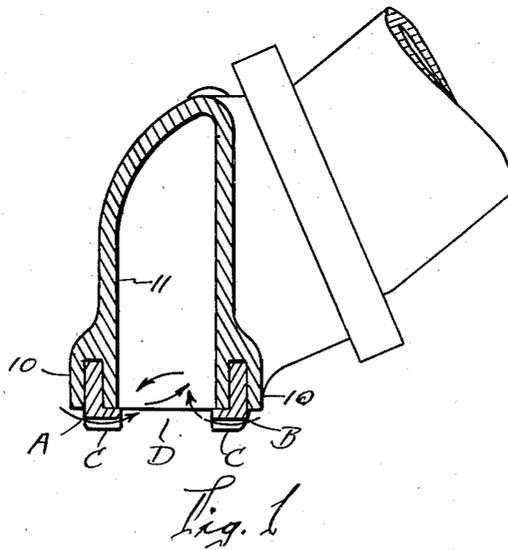
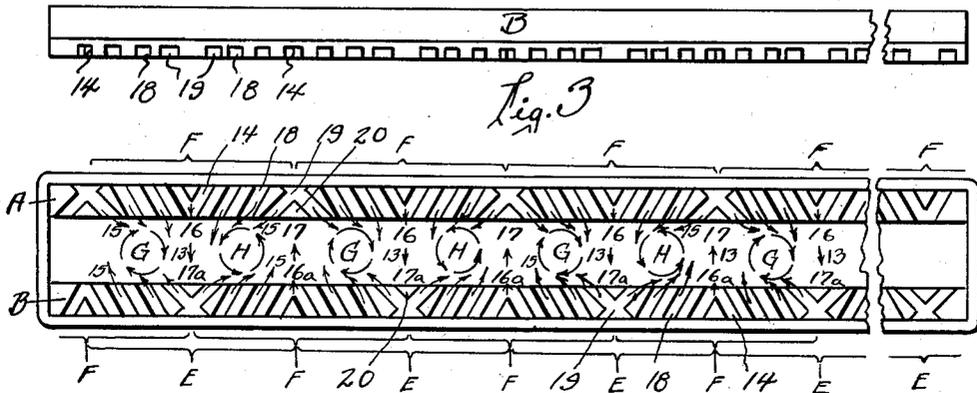
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SUCTION CLEANER

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SUCTION CLEANER

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The invention relates to suction cleaner floor tools of the type wherein the suction mouth is defined between a pair of lip agitators constructed with grooved working faces, the grooves forming air passages for producing jets of air for cleaning contact with the nap of a rug. The present invention is characterized by the arrangement of the slots or air passages so that a number of centers of rotating, or "cyclonic" air movement, will be set up within the floor tool, the cyclonic effect adding to the pick up efficiency of the air jets.

With these and other objects in view my invention consists in the combination and construction and arrangement of the various parts thereof, whereby the objects contemplated are attained, as more fully set forth in the accompanying specifications, pointed out in my claims, and illustrated in the accompanying drawing, in which:

Fig. 1 is a transverse sectional view through a suction cleaner floor tool embodying the invention.

Fig. 2 is an inverted plan view thereof, and

Fig. 3 is a side elevation of one of the agitators.

In the channels 10 of the floor tool 11, the agitators A and B are mounted so that their working faces C are positioned for contact with the floor, the suction mouth D being formed between the two agitators A and B, which are termed "lip" agitators because they form the lips of the suction mouth. Each set of grooves is common to two adjacent groups. For instance, the right set of a group E comprises the left set of the group, adjoining the said group E on the right, and the left set of the said group E comprises the right set of the group F adjoining said group E on the left.

The working face of each agitator is serrated with a number of groups of grooves E and F; the groups E each including two sets of grooves, diverging toward the mouth D, and the groups F each including two sets of grooves converging toward the mouth D.

The groups E of the agitator A are disposed opposite the groups F of the agitator B. In order that this may be accomplished without the necessity of providing two different agitators, each agitator terminates at one end with a group E and at its other end with a group F, as shown, so that when arranged in the floor tool with one agitator reversed, end for end, relative to the other, as it must be in order that the agitators may face each other, the groups E and F will be disposed opposite each other.

As a result of the opposite inclination of the alternate groups E and F, the air currents coming through an agitator will be divided into alternate groups of converging and diverging air jets, as indicated by the arrows 15. Opposite the centers of the converging air jets there will be produced regions of increased air pressure 16 moving toward the opposite side of the mouth as indicated by the arrows 13, while opposite the centers of the diverging groups there will be produced regions of reduced air pressure 17 toward which the air from the high pressure areas 16 will flow. The result will be a number of centers G and H of rotating air movement. This will be true whether one or two agitators are used, but the effect will be much more pronounced with two agitators, for the reason that the low pressure region 17a adjacent the agitator B will be directly opposite the high pressure region 16 adjacent the agitator A, while the high pressure region adjacent the agitator B will be directly opposite the low pressure region 17 of the agitator A, and the direction of the various air jets is such as to carry the air from the high pressure regions 16, 16a to the low pressure regions 17, 17a respectively, and all air jets are tangent to the rotating air swirls G, H, and travelling in the respective directions of rotation.

In order that the air jets may assume the well defined directions of travel inside the mouth, necessary to the creation of the air swirls G and H, it is necessary that they maintain their direction of initial injection to some extent after entering the mouth D. To this end, it is essential that there be several parallel grooves in each set comprising one half of a group E or F, as the case may be, since if only one groove were employed in each set, the centers of the groups would be too close together to secure this result.

Furthermore, the jets entering the mouth would then be all directed at right angles to the axis of the mouth, whereas in the present invention, the jets entering through the innermost grooves 14 of a converging group F will be thus directed at right angles to the axis, but the jets entering from the intermediate grooves 18 and outer grooves 19 (the inner grooves of the groups E) will enter at a very distinct acute angle to the axis of the mouth. Thus in the former case, the peripheries of the swirls G, H, would be impinged upon only at diametrically opposite points, whereas in the present invention they are impinged upon from both right angled and acute angled (relative to the mouth axis) directions. To further increase the number of directions of

contact, the grooves 19 are disposed at angles of about 45° whereas the grooves 18 are disposed at angles of about 60°, thus aiding in the maintenance of tangency of impingement.

5 The swirls G and H serve to increase the suction at the centers of swirling movement, whereby to increase the pick up efficiency of the tool.

10 The grooves 14 may be termed "neutral", for the reason that the air jets issuing therefrom neutralize the initial acute angular directions of each other so as to produce a single jet at right angles to the axis of the mouth.

Triangular lugs 20 are formed between the grooves 19.

15 What I claim as my invention is,

1. A lip agitator for attachment to a suction cleaner floor tool to define one side of the suction mouth thereof, said agitator being provided with a working face formed with a plurality of groups
20 of grooves each extending from the outer to the inner side of the agitator and inclined relative to the longitudinal axis thereof, each group comprising two sets of several grooves each which sets are each common to two adjacent groups,
25 the grooves of one set being inclined opposite to the direction of inclination of the other set of a given group, and the sets of alternate groups converging toward the floor tool mouth while the sets of the intervening groups diverge toward said
30 mouth, whereby air jets issuing into the mouth through said grooves will produce within the floor tool a series of spaced centers of rotating air movement.

2. A lip agitator for attachment to a suction
35 cleaner floor tool to define one side of the suction mouth thereof, said agitator being provided with a working face formed with a plurality of groups of grooves each extending from the outer to the

inner side of the agitator and inclined relative to the longitudinal axis thereof, each group comprising two sets of several grooves each which sets are each common to two adjacent groups,
5 the grooves of one set being inclined opposite to the direction of inclination of the other set of a given group, and the sets of alternate groups converging toward the floor tool mouth while the sets of the intervening groups diverge toward said
10 mouth, triangular lugs being formed between the sets of the divergent groups, and neutral air passages being formed between the sets of the convergent groups whereby air jets issuing into the mouth through said grooves will produce within
15 the floor tool a series of spaced centers of rotating air movement.

3. In a suction cleaner, a floor tool provided with a pair of spaced lip agitators defining the suction mouth thereof, each agitator having a working face provided with a plurality of groups
20 of grooves, each group comprising two sets of several grooves each which sets are each common to two adjacent groups, extending from the outer to the inner side of the agitator and inclined relative to the longitudinal axis of the agi-
25 tator, the grooves of one set being inclined in a direction opposite to the direction of inclination of the other set of a given group, and the sets of alternate groups converging toward the floor tool
30 mouth while the sets of the intervening groups diverge toward said mouth, the converging groups of one agitator being disposed opposite the diverging groups of the opposite agitator, whereby
35 air jets issuing into the mouth through said grooves will produce within the floor tool a series of spaced centers of rotating air movement.

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