

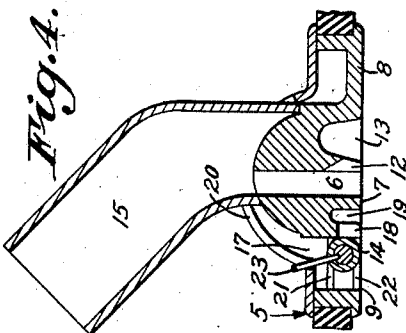
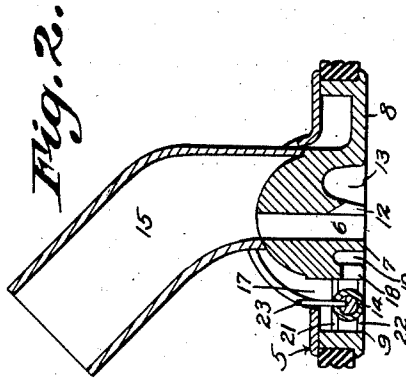
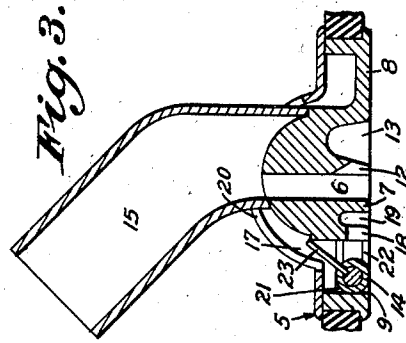
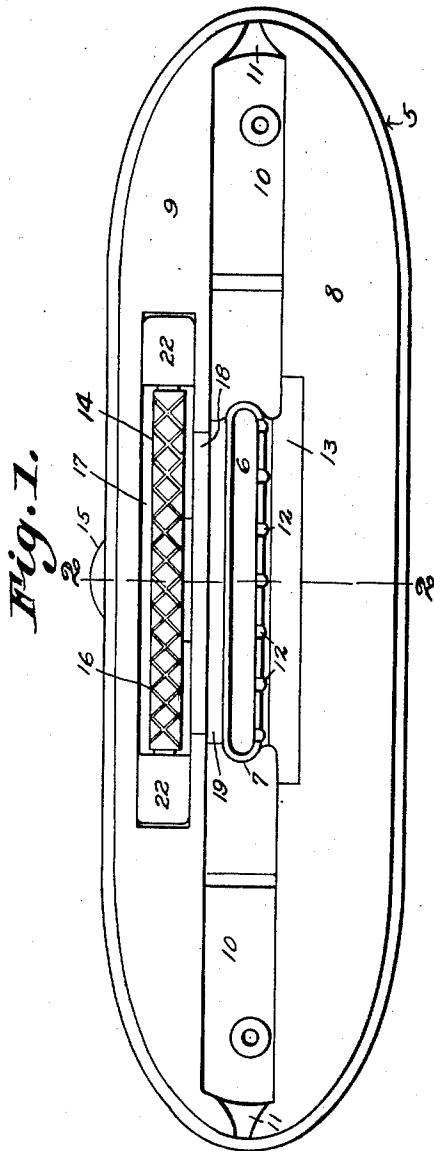
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VACUUM CLEANER NOZZLE WITH VARIABLE SUCTION CONTROL

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VACUUM CLEANER NOZZLE WITH VARIABLE
SUCTION CONTROL

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4 Claims. (Cl. 15—369)

1

This invention relates to vacuum cleaner nozzles, the primary object of the invention being to provide a nozzle wherein the suction area of the nozzle is appreciably increased, providing a nozzle which is capable of picking up threads, hairs, lint or the like material which usually adheres to the rug or carpet pile.

Another object of the invention is to provide a vacuum cleaner nozzle, wherein suction is evenly distributed throughout the entire area of the nozzle, lending to the efficiency of the nozzle.

Another object of the invention is to provide a vacuum cleaner nozzle wherein a novel cylindrical agitator operates to pick up threads, hairs, lint or the like from the face of a rug or carpet without causing damage to the rug.

Another object of the invention is to provide a vacuum cleaner nozzle wherein a pick-up cylindrical agitator for surface material operates upon the forward stroke of the nozzle to direct an auxiliary suction in front of the cylindrical agitator to draw surface material up and into the path of the cylindrical agitator and on the backward stroke of the nozzle operates to direct auxiliary suction back of and across the face of the cylindrical agitator for removing the material collected by the cylindrical agitator passing across the previously drawn up material.

A further object of the invention is to provide a vacuum cleaner nozzle wherein an auxiliary air suction path is so coordinated with a material pick-up cylindrical agitator than an effective and efficient drawing up of material and the removal of collected material on the cylindrical agitator is made possible.

A still further object of the invention is to provide a pick-up cylindrical agitator as an associated part of a vacuum cleaner nozzle wherein surface means are incorporated which operate not only to pick up loose material on the face of a rug or carpet but also effectively pushes rug nap smoothly out of the way and so prevents damage to the rug; and to provide other improvements as will hereinafter appear.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawing

Figure 1 is a bottom plan view of a vacuum

2

cleaner nozzle constructed in accordance with the invention.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 represents a section similar to Figure 2 showing the pick-up cylindrical agitator as positioned upon the working or forward stroke of the cleaner nozzle.

Figure 4 represents a section similar to Figure 2 showing the pick-up cylindrical agitator as positioned upon the non-working or backward stroke of the cleaner nozzle.

Referring to the drawing in detail, the nozzle comprises a substantially oval body portion indicated generally by the reference character 5, the body portion having a central suction opening 6 which is elongated longitudinally of the body portion 5, as clearly shown by Figure 1 of the drawing.

This central suction opening is formed by the flange 7 which terminates in the plane of the wide surfaces 8 and 9 that slide over the surface being treated with the vacuum cleaner nozzle.

At opposite ends of the body portion, and extending to a point adjacent to the central suction opening, are openings 10, that provide passageways extended longitudinally of the body portion, the passageways communicating with the atmosphere, through the openings 11 formed at the ends thereof.

The forward portion of the flange 7, namely adjacent the front of the nozzle, is formed with spaced cut-out portions 12 that establish communication with the recess 13, which in turn is in communication with the openings or passageways 10, at the ends thereof.

The reference character 14 designates a novel elongated pick-up roller which is arranged to contact with the surface over which the suction head or nozzle moves. The cylindrical agitator 14 is provided on its contact face with angularly disposed transverse intersecting grooves 16 extending lengthwise thereof to form rows of substantially diamond shaped projections throughout the operating area of the cylindrical agitator presenting shoulders or edges for directing loose material such as threads, lint or the like into the collecting grooves 16. The angular relation of the intersecting grooves is such that the apices of the projections follow in the path of movement of the nozzle and therefore part the face fabric or nap smoothly without damage to the rug or carpet.

As a means for introducing auxiliary air and for mounting the elongated cylindrical agitator

14 to serve both as a pick-up means and a selective control for the auxiliary source of air, a rectangular slot 17 is formed in the body 5 parallel to the flange 7 and on the opposite side thereof from the cut-out portions 12, and has its inner side cut away to form a passage 18 communicating with an elongated recess 19, which forms an intermediate continuation of the end openings or passages 10. The slot 17 is in communication with the atmosphere by a conduit 20 through the top of the body 5, and discharges past the cylindrical agitator 14. Thus, the auxiliary air is drawn successively through the slot 17, the passage 18, the recess 19, around the flange 7 of the suction opening, into the recess 13, where it is directly exposed to the vacuum through the cut-out portions or notches 12 leading to the suction opening 6. The width of the slot 17 is greater than the diameter of the cylindrical agitator 14 so that the cylindrical agitator can move laterally to change the discharge path of the auxiliary air. This movement is made possible by providing transverse parallel spaced-apart guideways 21 and 22 at opposite ends of the slot 17 to respectively receive the reduced ends of the cylindrical agitator, whereby the latter not only has a pivotal mounting, but also provides for lateral movement from one side of the slot to the other. The guideways 21 are provided by a part of the body, while the guideways 22 are retaining plates fixed to the body, as will be apparent. A stop 23 is attached to and projects radially upward from the cylindrical agitator 14 to lie between the fixed bounding walls of the slot 17 to thereby limit the turning movement of the cylindrical agitator 14 and thus ensure the pick-up surface being properly positioned at all times. The operation of the nozzle takes place as follows: On the forward stroke of the nozzle, as shown in Fig. 3, the cylindrical agitator 14 is shifted rearwardly by carpet friction and so directs the incoming auxiliary air in front of the cylindrical agitator so that it passes across the face of the carpet to continue through the passage 18 into the elongated recess, where it passes around the flange 7 to recess 13, and by way of the cut-out portions 12 to the suction opening. Thus, lint, threads or surface dirt are drawn out of the carpet and in front of the cylindrical agitator 14 and collected by the pick-up surface. On the backward stroke of the nozzle, as shown in Fig. 4, the cylindrical agitator 14 is shifted forwardly by carpet friction to close the previous path for the incoming air and open a path back of the cylindrical agitator so that the suction now draws this air across the face of the lint-filled pick-up face to sweep the collected material into the suction discharge and so clear the face of the cylindrical agitator 14 ready for the succeeding forward stroke of the nozzle. The reference character 15 indicates the pipe that affords means for connecting the usual vacuum cleaner hose to the nozzle.

From the foregoing it will be seen that due to the construction shown and described, the suction area of the nozzle has been appreciably increased, since the cut-out portions or notches 12, establish communication between the suction opening of the nozzle, and the passageways formed at the ends of the opening 6, and provide a nozzle which will readily pick up threads, hair, lint or like material which usually adheres to carpets and rugs.

It will further be seen that the grooves in cylindrical agitator 14 will act to readily remove

lint, hair, threads or the like, which the main suction fails to remove.

What is claimed is:

1. A vacuum cleaner nozzle comprising the combination of an elongated body having a floor contact face provided with spaced passageways formed in the ends thereof and communicating respectively with the atmosphere, a flange disposed lengthwise of said body intermediate said passageways forming an elongated suction opening, said flange being vertically disposed and terminating substantially in the plane of said contact face, means at the base of one side of said flange forming a communication between said suction opening and said passageways, said body having a slot beside said flange on the flange side opposite to said communication means and opening to the atmosphere for the passage of auxiliary air, means forming an air passage from one side of said slot to said passageways, a cylindrical agitator formed with transverse grooves in the surface thereof, said agitator having a diameter less than the width of said slot, and means mounting said agitator lengthwise in said slot for bodily movement transversely of said slot with the grooved surface thereof in contact with a carpet, said agitator being movable transversely of said slot from contact with one side of said slot to contact with the opposite side of said slot in response to reversals in the direction of nozzle movement, whereby the flow of auxiliary air to said air passage is substantially blocked off except through said agitator grooves when the agitator is in contact with one side of said slot, and permitting free flow of said auxiliary air to said passage when the agitator is in contact with the opposite side of said slot.

2. A vacuum cleaner nozzle in accordance with claim 1 wherein the agitator is mounted for turning movement, and stop means are provided for limiting such turning movement.

3. A vacuum cleaner nozzle comprising the combination of a body having a suction opening through the working face thereof and also having a slot in said face adjacent to and extending along one side of said opening, said slot communicating with the atmosphere for the passage of auxiliary air, passage-forming means in the working face of said body communicating with one side of said slot and with said opening for leading such auxiliary air from said slot to said suction opening, a cylindrical agitator provided with transverse grooves in the surface thereof forming radially extending relatively closely spaced lint pick-up projections substantially throughout the length of said agitator, said agitator having a diameter less than the width of said slot, and means mounting said agitator lengthwise in said slot for bodily movement transversely of said slot from contact with one side of said slot to contact with the opposite side of said slot in response to reversals in the direction of nozzle movement, said mounting means maintaining said projections in rug-contacting position in all positions of said agitator, whereby the flow of auxiliary air to said passage-forming means is substantially blocked off except through said agitator grooves when the agitator is in contact with one side of said slot, and permitting free flow of said auxiliary air to said passage when the agitator is in contact with the opposite side of said slot.

4. A vacuum cleaner nozzle according to claim 3 wherein the projections formed by the transverse grooves are substantially diamond-shaped

5

and have axes respectively parallel to the direction of travel of said nozzle.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
876,766	Blaisdell	Jan. 14, 1908
936,222	Dalzell	Oct. 5, 1909
1,038,517	Ball	Sept. 17, 1912
1,053,683	Van Ness	Feb. 18, 1913
1,800,316	Replogle	Apr. 14, 1931
1,944,091	Lutz	Jan. 16, 1934

Number
1,980,438
2,027,543
2,027,544
2,153,457
2,157,077
2,210,030
2,275,357
2,278,382
2,348,082

Number
201,639
400,618
427,245

6

Name	Date
Riebel	Nov. 13, 1934
Lofgren	Jan. 14, 1936
Lofgren	Jan. 14, 1936
Fechtenburg	Apr. 4, 1939
Kroenlein	May 2, 1939
Ellis	Aug. 6, 1940
Gaines	Mar. 3, 1942
Ross	Mar. 31, 1942
Lofgren	May 2, 1944

FOREIGN PATENTS

Country	Date
Great Britain	Aug. 3, 1923
Great Britain	Oct. 23, 1933
Great Britain	Apr. 17, 1935