Sept. 22, 1942. T. C. BETTS 2,296,462

SUCTION NOZZLE

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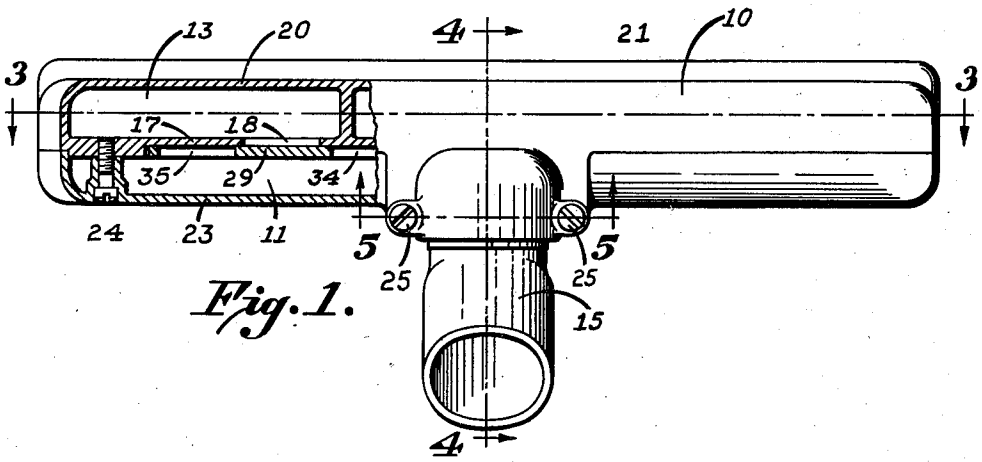


Fig. 1.

Fig. 2.

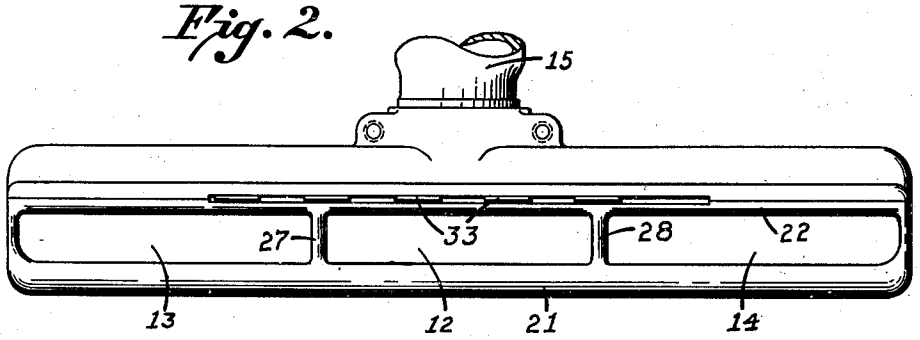
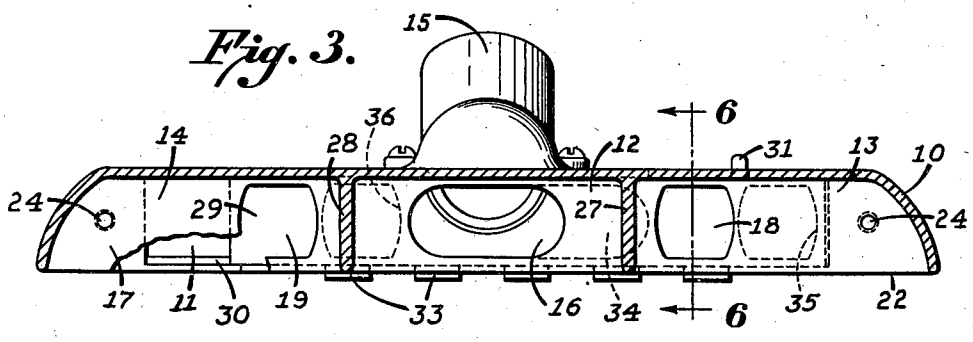


Fig. 3.



INVENTOR.

BY Thomas C. Betts

Arthur J. Praagley

ATTORNEY.

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Fig. 4.

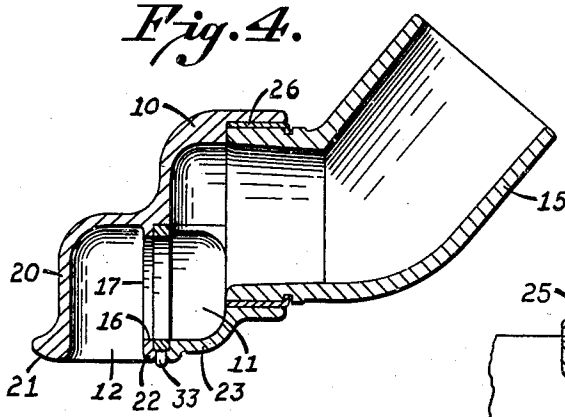


Fig. 5.

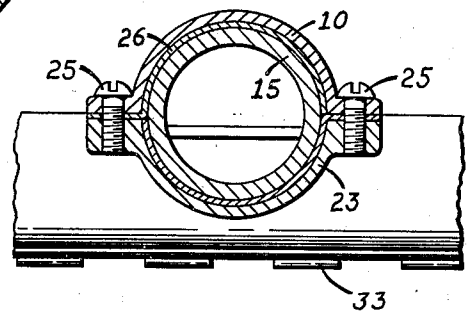


Fig. 6.

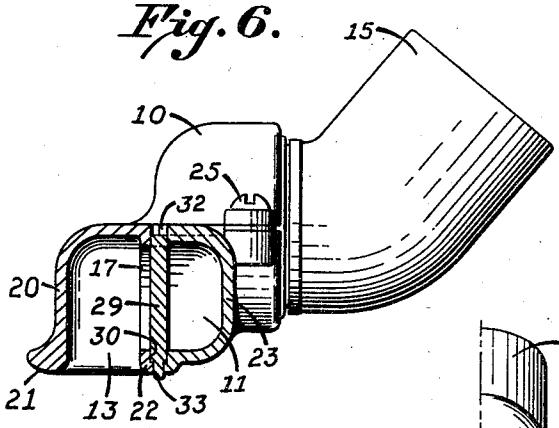


Fig. 7.

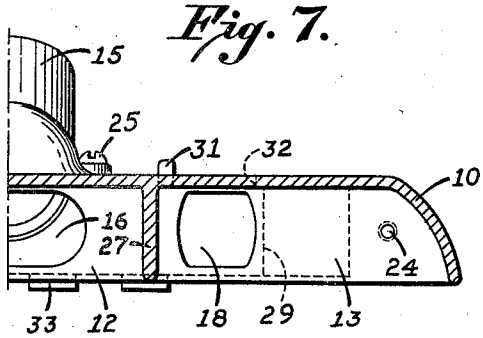
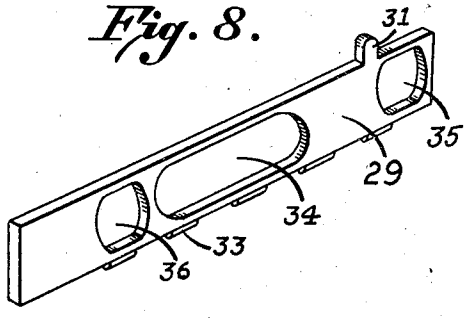


Fig. 8.



INVENTOR.

BY Thomas C. Betts

Arthur F. Prangley

ATTORNEY.

Patented Sept. 22, 1942 2,296,462

UNITED STATES PATENT OFFICE

2,296,462

SUCTION NOZZLE

Thomas C. Betts, Bronxville, N. Y., assignor to Electrolux Corporation, New York, N. Y., a corporation of Delaware

Application December 13, 1940, Serial No. 369,932

5 Claims. (Cl. 15—155)

My invention relates to suction nozzles and more particularly to nozzles of the type having a relatively large suction opening with a valve to concentrate the flow of air in only a portion of the suction opening.

Suction nozzles for cleaning rugs are provided with elongated suction openings of a size to permit the flow of a volume of air with a suction sufficient to remove embedded dirt from the rug pile. By concentrating the flow of air in a smaller suction opening, the volume of flow is somewhat reduced but the velocity of the air is increased. This increased air velocity produces a greater force for lifting light material such as hairs, threads, and the like which adhere to the rug surface. This concentrated air flow has been produced by a valve closing off a portion of the suction opening and directing all of the air through the remaining portion of the opening. Means have been devised heretofore for operating the valve which require a difficult or awkward manual operation.

In accordance with this invention an improved suction nozzle is provided with a valve for concentrating the air flow which may be operated with a minimum of effort.

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

Fig. 1 is a top view of the nozzle broken away in part;

Fig. 2 is a bottom view of the nozzle;

Fig. 3 is a front sectional view of the nozzle;

Fig. 4 is a side sectional view taken along the line 4—4 of Fig. 1;

Fig. 5 is an enlarged sectional view taken along the line 5—5 of Fig. 1;

Fig. 6 is a side sectional view taken along the line 6—6 of Fig. 3;

Fig. 7 is a sectional view similar to Fig. 3 of one half of the nozzle with the valve in a different position; and

Fig. 8 is a perspective view of the valve member.

Referring to the drawings, 10 indicates a nozzle body having a chamber 11 and three suction slots, a central slot 12, and two end slots 13 and 14. Chamber 11 communicates with an elbow 15 secured to body 10. Elbow 15 is rotatable on an axis perpendicular to the lengthwise extent of suction slots 12, 13, and 14 and is adapted for connection to a flexible hose, not shown, which is connected to a vacuum cleaner. Suction slot 12 communicates with chamber 11 through an opening 16 in a wall 17 separating chamber 11 from slots 12, 13, and 14.

Similarly, suction slots 13 and 14 communicate with chamber 11 through openings 18 and 19, respectively, in wall 17. Body 10 has a front wall 20 terminating in a smooth lip 21 forming the forward edge of slots 12, 13, and 14. Wall 17 at its bottom end forms a smooth rear lip 22 for slots 12, 13, and 14. A plate 23 secured to body 10 by screws 24 and 25 forms a bottom and rear wall for chamber 11. Elbow 15 is provided with a steel sleeve 26 and is secured between body 10 and plate 23. Slot 13 is separated from slot 12 by a transverse wall 27. Similarly, slot 14 is separated from slot 12 by a transverse wall 28. A slide plate 29 is seated in a recess 30 in wall 17. Plate 29 has an upstanding finger 31 extending through a slot 32 in the top of body 10. One or more feet 33 depend from plate 29 a short distance below rear lip 22. As illustrated, feet 33 preferably have rounded front and rear edges so as to offer a minimum of resistance to forward and backward movement of the nozzle over a rug, but have straight and unrounded end surfaces in order to offer a substantial resistance to sidewise movement of the feet relative to the rug. A plurality of feet is preferred, inasmuch as this provides additional end surface to engage the rug when the nozzle is moved sidewise. As best indicated in Fig. 8, plate 29 has a central opening 34 and two end openings 35 and 36. When plate 29 is in the position as shown in Fig. 7, opening 34 uncovers opening 16, opening 35 uncovers opening 18 and opening 36 uncovers opening 19. When plate 29 is in the position as shown in Fig. 3, end openings 18 and 19 are covered while opening 16 is uncovered by opening 34.

In normal operation the plate 29 will be in the position indicated in Fig. 7 with all three suction slots, 12, 13, and 14 communicating with chamber 11. This, in effect, produces a single elongated suction slot which will efficiently remove embedded dirt and dust from the rug pile. Whenever surface litter is encountered which adheres so tenaciously to the rug that it is not removed in normal operation, the air flow may be concentrated in the central suction slot 12. This is accomplished by moving the nozzle body 10 in contact with the rug towards the right when looking at the nozzle from the rear. The depending feet 33 by virtue of their unrounded ends tend to hold plate 29 stationary as the body 10 moves to the right because of the greater relative friction between the feet 33 and rug than

between the smooth lips 21 and 22 and the rug. This transverse movement of the nozzle body to the right moves plate 29 to the left to the position, indicated in Fig. 3, covering the openings 18 and 19 and thereby concentrating the air flow in the central suction slot 12 which alone communicates with chamber 11 through opening 16. Plate 29 is a slide valve which is operated by friction upon movement of the nozzle transverse to the normal direction of movement of the nozzle. The valve or plate 29 is returned to its original position for normal cleaning by a transverse movement of the nozzle body to the left which moves plate 29 to the right uncovering all three openings 16, 18, and 19. The position of the valve is indicated by the upstanding finger 31 of plate 29. When finger 31 is in the position to the extreme right of slot 32 the plate 29 is in its normal position with all three suction slots 12, 13, and 14 in communication with chamber 11. Obviously, the operator could shift the valve by moving the finger 31 with her hand or foot.

It is to be understood that while a preferred form of the invention is illustrated, the invention is not limited to the details of construction as shown but the scope of invention as pointed out in the appended claims.

What I claim is:

1. A suction nozzle for cleaning a surface including a body member having a plurality of suction slots, a sliding plate for controlling the connection of the suction slots to a source of suction, and a plurality of feet depending from said plate to contact the surface being cleaned for moving said plate upon movement of the nozzle relative to said surface transverse to the normal direction of movement.

2. A suction nozzle for cleaning a surface including a body member having a suction opening and a suction chamber, a wall separating said suction opening from said suction chamber, partitions sub-dividing said suction opening into a plurality of separate slots communicating through individual openings with said suction chamber, means for connecting said suction opening to a source of suction, smooth lips for said suction opening, and a slide valve having a portion extending below said lips to contact the surface being cleaned and adapted upon transverse movement of the nozzle relative to said surface to close some of the openings communicating with said suction chamber for concentrating the flow of air in a portion only of the suction opening.

3. A suction nozzle for cleaning a surface including a body member having a suction opening and a suction chamber, means for connecting said suction chamber to a source of suction, smooth lips formed on said body member for said suction opening, means sub-dividing said suction opening into a plurality of individual suction slots communicating through individual openings with said suction chamber, and a slide valve interposed between said suction opening and said suction chamber having feet depending below the plane of said lips to contact the surface being cleaned and adapted to close some of the openings communicating with said suction chamber upon transverse movement of the nozzle relative to said surface to concentrate the flow of air through a portion only of the suction opening.

4. A suction nozzle for cleaning a surface including a body member having a suction opening and a suction chamber, means for connecting said suction chamber to a source of suction, a plurality of openings communicating with said suction opening and with said suction chamber, walls extending transversely of said suction opening between the openings communicating with said suction chamber, said body member having smooth lips extending around said suction opening, and a slide valve located between said suction opening and said suction chamber having feet depending below the plane of said lips to contact the surface being cleaned and adapted upon transverse movement of the nozzle in relation to said surface to close some of the openings communicating with said suction chamber to concentrate the flow of air in a portion only of the suction opening.

5. A suction nozzle adapted to be moved backward and forward over a rug and including a body member having a plurality of suction slots, a plate mounted for sidewise movement in said body for controlling the connection of the suction slots to a source of suction and a member depending from said plate for engagement with the rug, the front and rear edges of said member being rounded and the side surfaces of said member being straight.

THOMAS C. BETTS.