Nov. 2, 1943. C. L. BROWN, JR 2,333,409

SUCTION NOZZLE

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Fig. 1.

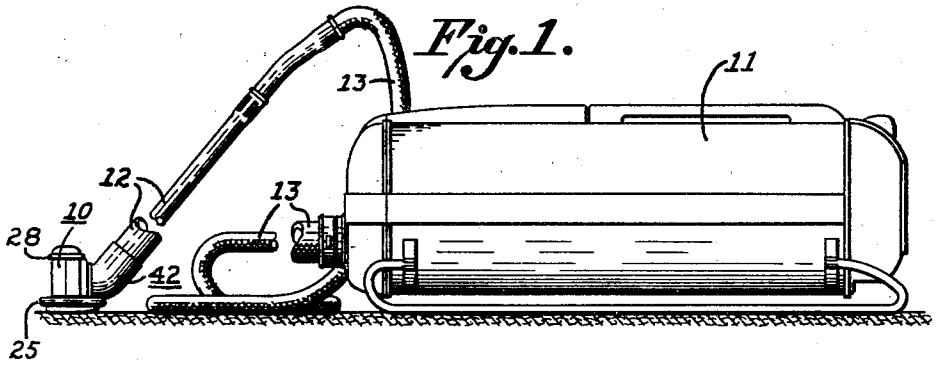


Fig. 2.

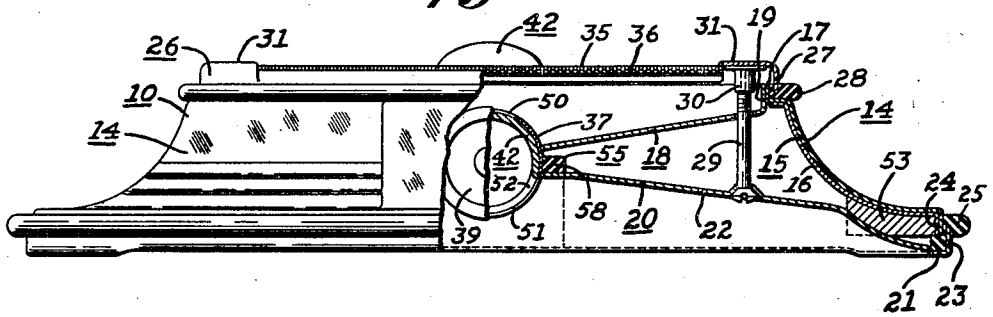
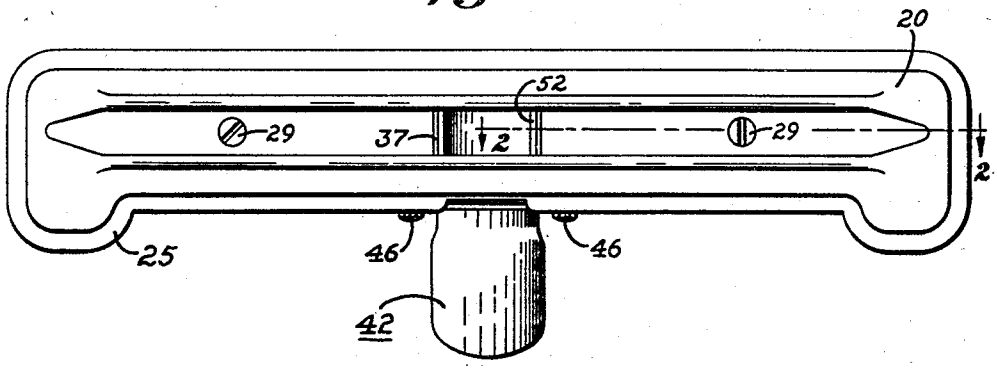


Fig. 3.



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Fig. 4.

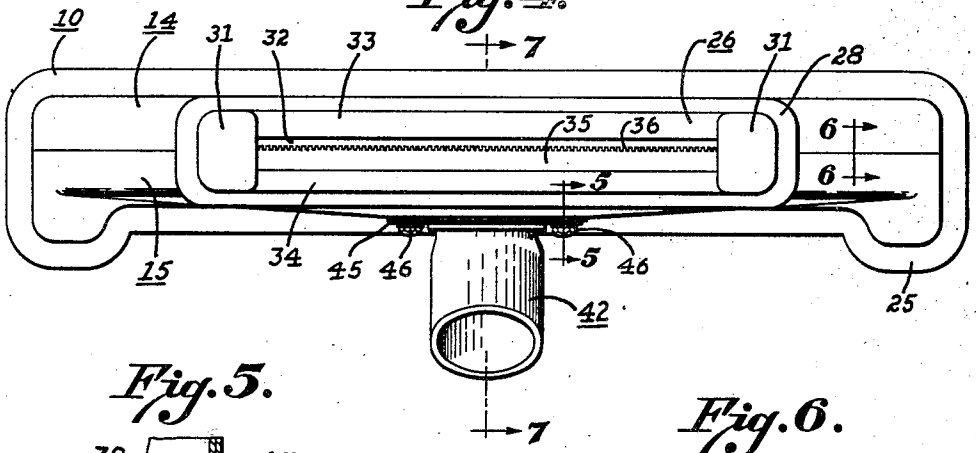


Fig. 5.

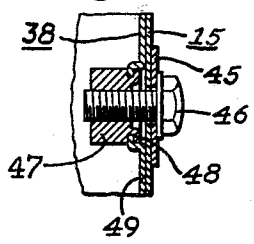


Fig. 6.

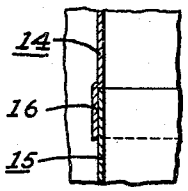
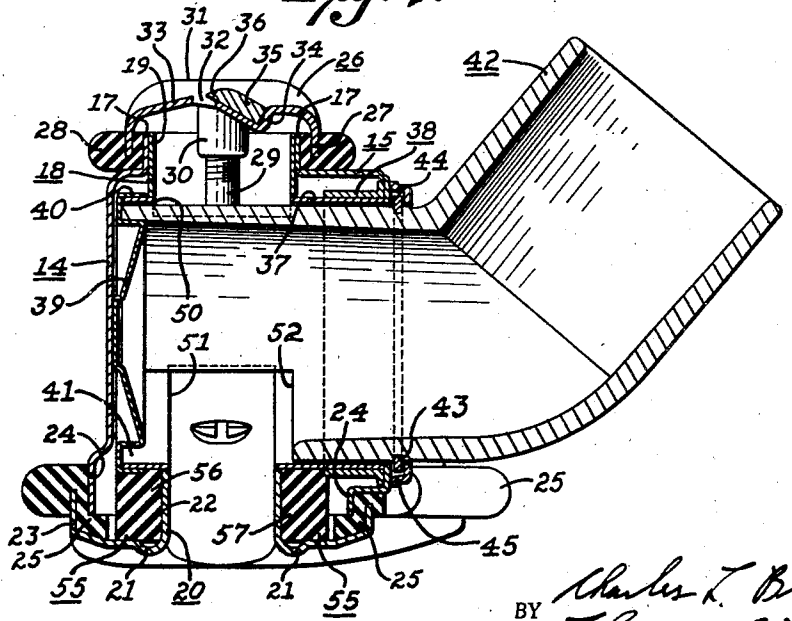


Fig. 7.



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SUCTION NOZZLE

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Fig. 8.

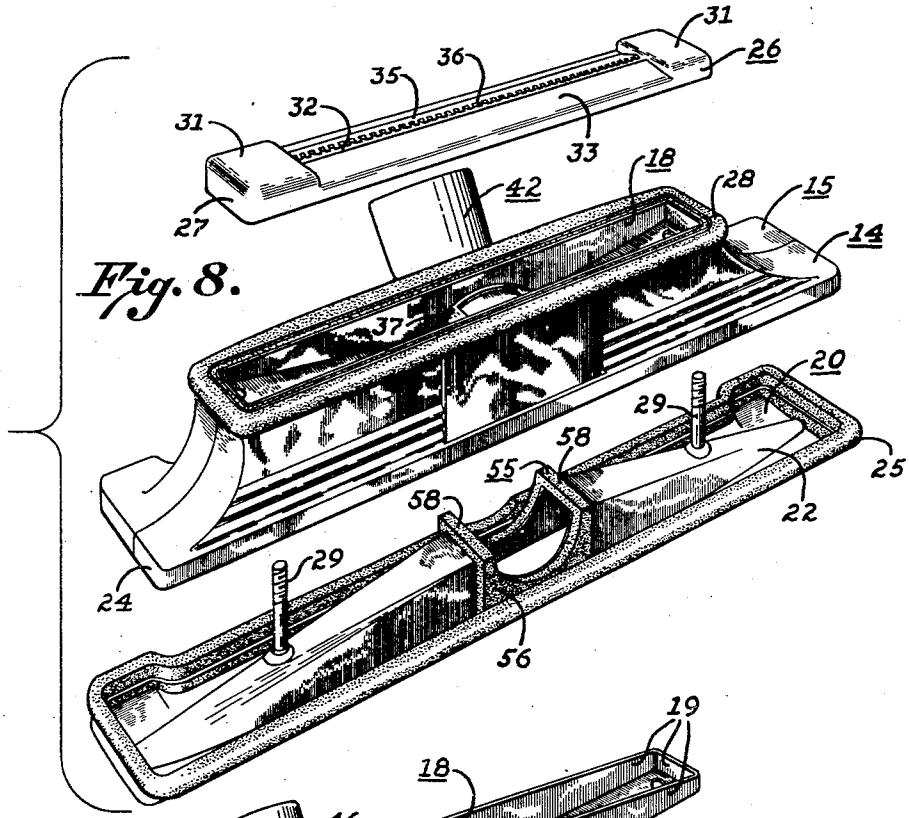
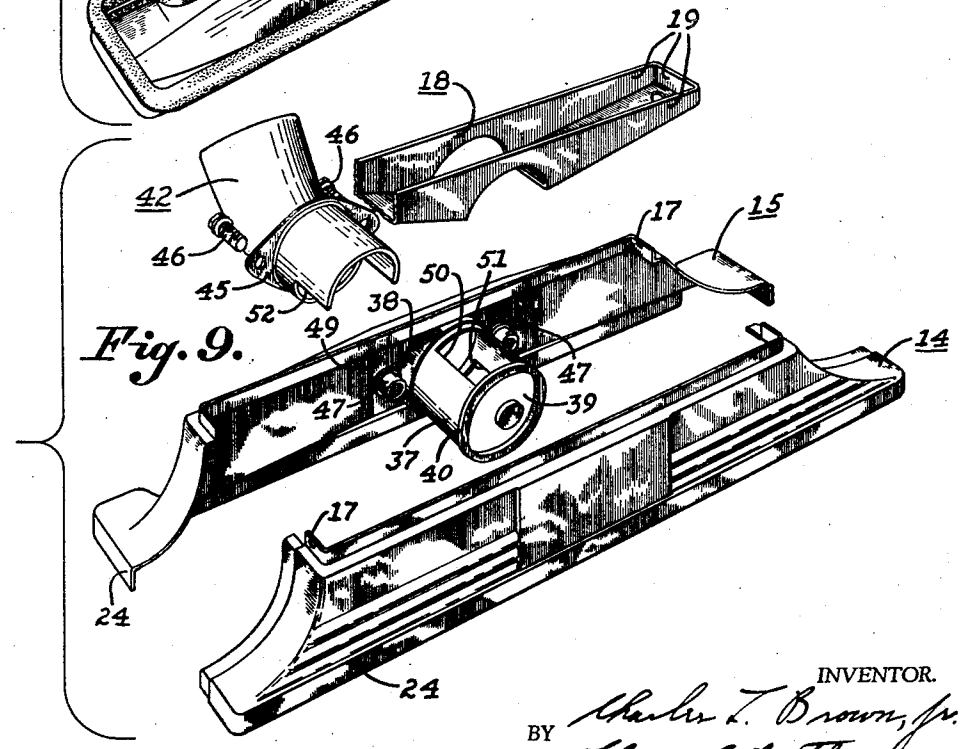


Fig. 9.



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UNITED STATES PATENT OFFICE

2,333,409

SUCTION NOZZLE

Charles L. Brown, Jr., Stamford, Conn., assignor to Electrolux Corporation, New York, N. Y., a corporation of Delaware

Application October 9, 1941, Serial No. 414,225

6 Claims. (Cl. 15—155)

The present invention relates to an improved suction nozzle for vacuum cleaners, and more particularly to a nozzle of the type which is separate from the cleaner unit and is connected thereto by means of a rigid tubular handle and a flexible hose.

One of the objects of the invention is to provide a nozzle of this nature made substantially entirely of metal stampings. Heretofore it has been the general practice to make nozzles in the form of castings of a light metal, such as aluminum. In accordance with this invention, the nozzle may be made of heavier metal, but in the form of thin sheets, whereby the total weight of the nozzle is not increased materially, if at all.

Further objects and advantages of the invention will be apparent from the following description considered in connection with the accompanying drawings which form a part of this specification and of which:

Fig. 1 is an end view of a nozzle in accordance with my invention connected by means of a flexible hose and rigid handle to a vacuum cleaner unit;

Fig. 2 is a front view on a larger scale of the nozzle shown in Fig. 1, and is taken in part on the line 2—2 of Fig. 3;

Fig. 3 is a bottom view of the nozzle shown in Fig. 2;

Fig. 4 is a top view of the nozzle shown in the preceding figures;

Fig. 5 is a cross-sectional view on an enlarged scale taken on the line 5—5 of Fig. 4;

Fig. 6 is a cross-sectional view on an enlarged scale taken on the line 6—6 of Fig. 4;

Fig. 7 is a cross-sectional view on an enlarged scale taken on the line 7—7 of Fig. 4;

Fig. 8 is a vertically exploded view of the nozzle shown in the preceding figures; and

Fig. 9 is a horizontally exploded view of a part of this nozzle.

Referring to the drawings, reference character 10 indicates generally the nozzle in accordance with the present invention. As is shown in Fig. 1, this nozzle may be connected to a vacuum cleaner unit 11 by means of a rigid hollow handle 12 and a flexible hose 13. The nozzle itself is shown in detail in the following figures.

Nozzle 10 is made up chiefly of sheet metal stampings. It includes two main body stampings, the front stamping being designated by reference character 14, and the rear stamping by reference character 15. As shown more particularly in Fig. 6, these stampings are secured together by means of a lap weld 16. At their upper edges the stampings 14 and 15 are formed with a vertical flange 17 which extends around and bounds an upper opening. A stamping 18, forming a throat for a small nozzle opening, is provided with a flange 19 extending around its base, which flange is secured to the flange 17, as by welding.

A stamping 20 is formed with lips 21 from the inner edge of which extends a throat portion 22 and from the outer edge of which extends a vertical flange 23. Stampings 14 and 15 are formed with a downwardly extending flange 24 and a combined bumper and sealing member 25 is disposed between the flanges 23 and 24.

A stamping 26 is formed with a depending flange 27 and a combined bumper and sealing member 28 is disposed between this flange and the flange 17 on the stampings 14 and 15. The stampings 20 and 26 are drawn against the sealing members 25 and 28, respectively, by means of a pair of bolts 29, the heads of which engage the stamping 20, while the threaded shanks are screwed into threaded members 30 welded to the stamping 26. These bolts pass freely through openings formed in stamping 18.

Stamping 26 is formed at either end with raised bearing surfaces 31. Between these surfaces the stamping is formed with a relatively narrow elongated slot 32 bounded by inclined walls 33 and 34. Wall 34 is formed with an offset shelf on which is mounted a metal bar 35 formed with teeth 36. The bar may be welded to the wall 34. As shown particularly in Fig. 7, the edge of the bar on which the teeth 36 are formed extends somewhat beyond the edge of wall 34, so that the teeth are unobstructed.

A cylindrical sleeve 37 is secured in alignment with a circular opening formed in the rear stamping 15 by means of the flanged collar 38 which is welded to the sleeve and secured to the rear stamping. The forward end of the sleeve is closed by means of a dished end plate 39 having a circular flange 40. The center of the plate is preferably welded to the front stamping 14. The end plate 39 is formed with an annular recess 41 within which is received the end of a hollow elbow 42 which is rotatably mounted in sleeve 37. Elbow 42 is retained against axial displacement within the sleeve 37 by the means of a split lock ring 43 disposed within an annular groove formed in the outer surface of the elbow. Ring 43 also extends into an annular space 44 formed between the outer wall of rear stamping 15 and a plate 45 which is removably secured to the rear wall by means of bolts 46.

As is shown more particularly in Fig. 5, each bolt 46 extends through an opening in stamping 15 and has threaded engagement with a nut 47 which is permanently secured in an opening formed in ears 49 extending from the flange of collar 38, by having a lip 48 spun over the edge of the opening.

The central portion each of stampings 18 and 22 is formed with an opening within which is received sleeve 37. The sleeve is formed with an upper opening 50 which communicates with the throat bounded by stamping 18, and is formed with a lower opening 51 which communicates with the throat bounded by stamping 20. The portion of elbow 42 which is disposed within sleeve 37 is formed with an opening 52 which may be brought into registry with either the opening 50 or the opening 51 in the sleeve. In the position shown in the figures, opening 52 registers with the opening 51, and consequently the larger nozzle opening formed by the stamping 20 is in communication with the interior of elbow 42 and consequently, through the wand 12 and conduit 13, with the vacuum cleaner. In the event that it is desired to employ the other nozzle opening 32, the nozzle is rotated about the elbow 42 so as to bring this opening into contact with the floor. When this is done, opening 52 in the elbow registers with opening 50 in the sleeve 37, and consequently establishes communication between the nozzle opening 32 and the interior of the elbow. In order to facilitate rotation of the nozzle about the elbow, a weight 53 is disposed at one end of the nozzle so as to cause an unbalance. Thus, when the nozzle is lifted from the floor by means of the wand 12, the weight 53 initiates rotation of the nozzle about the elbow.

The relatively large suction opening provided by stamping 20 is bounded by comparatively smooth lips which tend to seal against the rug or other woven floor covering, which causes a substantial percentage of the air entering the nozzle to be drawn through the material of the rug, thus removing imbedded dirt over a comparatively large area. The opening 32, being much more restricted in area than that provided by the stamping 20, gives a more concentrated flow of air. Moreover, the teeth 36 serve to dislodge articles, such as threads and dog or cat hairs, from the surface of the rug and the air rushing between the teeth is able to pick up such articles.

A member 55 of moulded rubber is disposed within the nozzle so as to form a substantially airtight seal between the throat portion 22 of the lower stamping 20 and the sleeve 37. As is shown in Figs. 2, 7 and 8, this member includes a front portion 56 and a rear portion 57. Each of these portions is formed with a straight lower edge which bears against the bottom of stamping 20, and with a semicircular upper edge which bears against the sleeve 37. These front and rear portions are joined together by transverse portions 58 which extend across the top of stamping 20 adjacent to the sleeve 37. Thus, the member 56 occupies space adjacent to the juncture between stamping 20 and sleeve 37 so as to provide a substantially airtight joint between these members.

It will thus be seen that in accordance with the invention there is provided a nozzle constructed substantially entirely of thin sheet metal stampings, thus giving a nozzle which is light in weight even though the metal of which the stampings are made may be relatively heavy.

While there has been shown and described one more or less specific embodiment of the invention, it is to be understood that this has been done for purposes of illustration only, and that the scope of the invention is not to be limited thereby, but is to be determined by the appended claims.

What is claimed is:

1. In a suction nozzle, a front stamping and a rear stamping joined together to form a hollow nozzle body open at opposite faces, said rear stamping being formed with a centrally located opening, a connection member associated with said opening, a dished stamping set in one of said open faces and having a lip portion bounding a suction opening, a resilient packing member disposed between said lip portion and the adjacent edges of said front and rear stampings, said dished stamping including a throat portion extending from said lip portion and communicating with said connection member, a stamping formed with an elongated slot covering the other of said open faces, a resilient packing member disposed between the slotted stamping and the adjacent edges of said front and rear stampings, tightening means engaging said dished stamping and said slotted stamping for drawing them towards said front and rear stampings with said packing member clamped in between, means forming a passageway leading from said slot to said connection member, and valve means for interrupting communication between said connection member and either said throat or said slot.

2. In a suction nozzle, a front stamping and a rear stamping joined together to form a hollow nozzle body open at opposite faces, said rear stamping being formed with a centrally located opening, a connection member associated with said opening, a first inwardly dished stamping set in one of said open faces, a second inwardly dished stamping set in the other of said open faces, each of said dished stampings providing a nozzle throat leading to said connection member, said first dished stamping being formed with flange structure providing lips, a stamping formed with an elongated slot covering the outer end of said second dished stampings, threaded means engaging said first dished stamping and said slotted stamping for drawing them towards each other and against said front and rear stampings, and valve means for interrupting communication between either of said throats and said connection member.

3. In a suction nozzle, a front stamping and a rear stamping joined together to form a hollow nozzle body open at two faces, said rear stamping being formed with a centrally located opening, a connection member associated with said opening, an inwardly dished stamping set in one of said open faces and received within the hollow nozzle body to provide a nozzle throat communicating with said connection member, and a stamping formed with an elongated slot covering the open end of said dished stamping to provide a relatively restricted inlet opening.

4. In a suction nozzle, a front member and a rear member joined together to form a hollow nozzle body open at opposite faces, said rear member being formed with a centrally located opening, a connection member associated with said opening, a dished member set in one of said open faces and having a lip portion bounding a suction opening, said dished member including a throat portion extending from said lip portion and communicating with said connection member, a member formed with an elongated slot covering the other of said open faces, tightening means engaging said dished member and said

slotted member for drawing them towards said front and rear members, means forming a passageway leading from said slot to said connection member, and valve means for interrupting communication between said connection member and either said throat or said slot.

5. A suction nozzle comprising a front member and a rear member united to form a hollow body with open bottom and top faces, a throat forming member set in one of said open faces and having portions thereof located outwardly of said hollow body and providing surface contacting lips, a second throat forming member for the other open face received within said hollow body, a member with an elongated slot covering said second throat forming member to provide a restricted inlet opening, a connection at the rear of said nozzle adapted to be connected to a source of suction, and valve means for applying suction to either of said throat members.

6. A suction nozzle comprising a front member and a rear member united to form a hollow body with open bottom and top faces, a throat forming member set in one of said open faces and having portions thereof located outwardly of said hollow body and providing surface contacting lips, a second throat forming member for the other open face received within said hollow body, a connection at the rear of said nozzle adapted to be connected to a source of suction, and valve means for applying suction to either of said throat members and said members all being of stamped sheet metal.

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