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SUCTION NOZZLE FOR SUCTION CLEANERS

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Fig. 1.

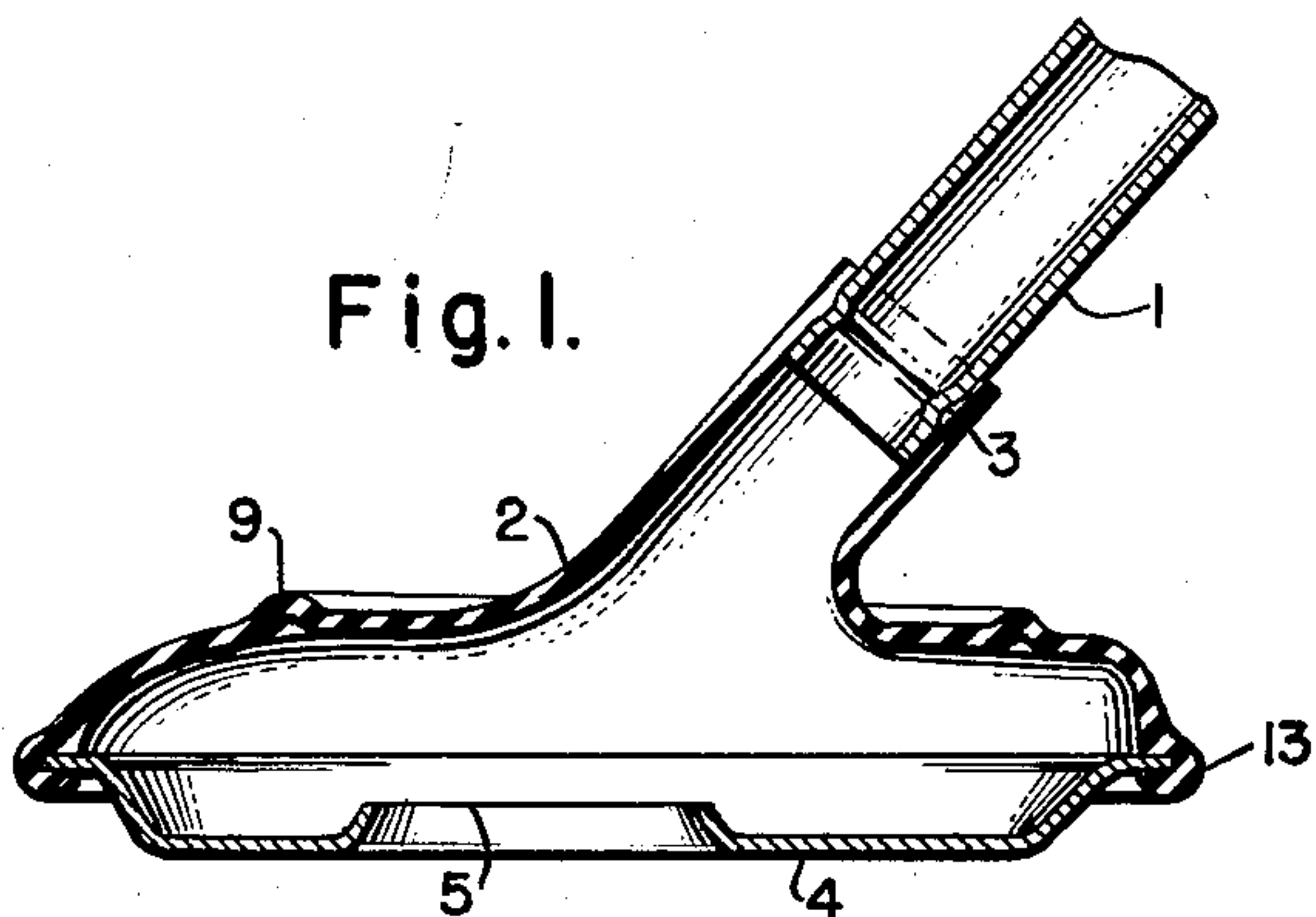


Fig. 2.

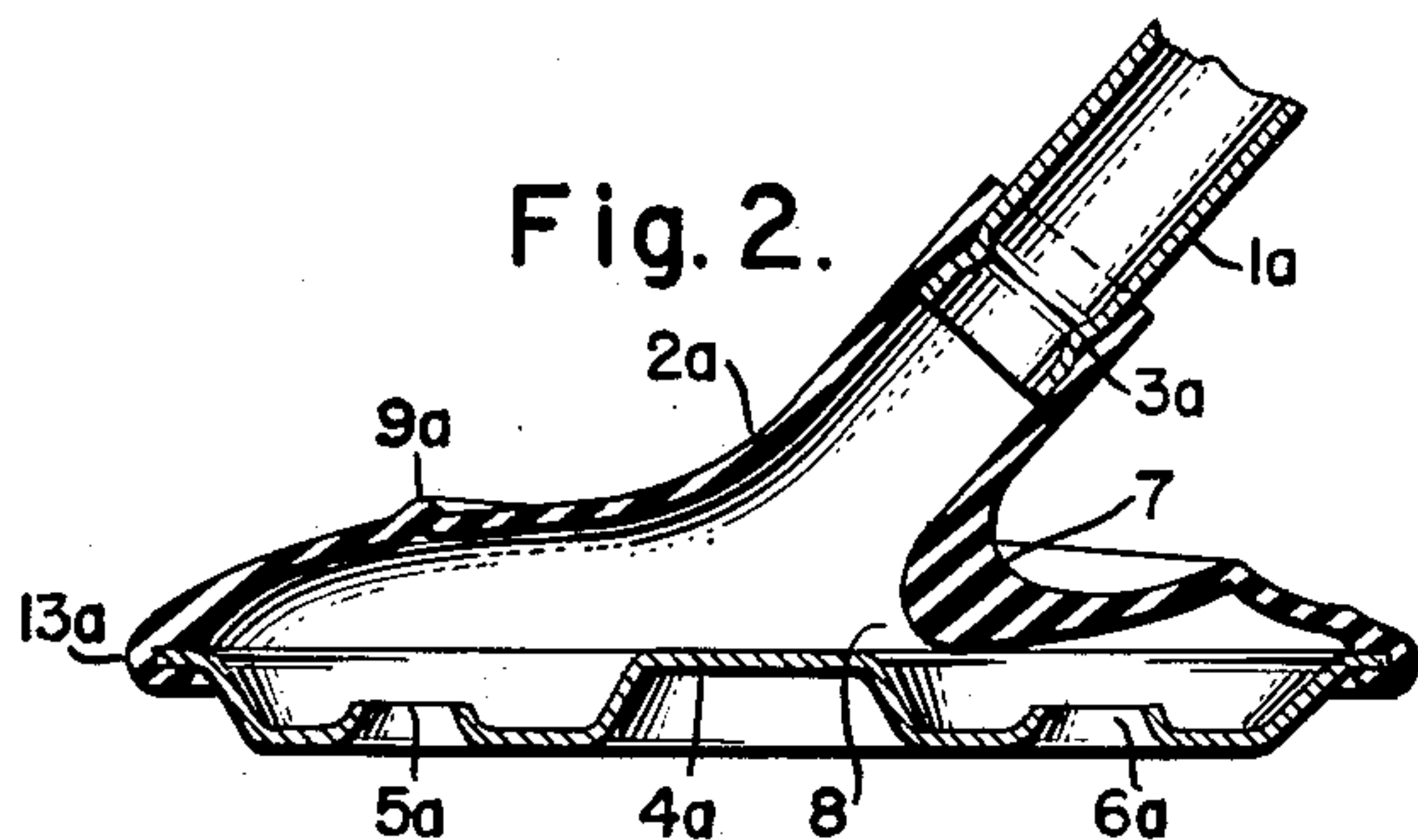


Fig. 3.

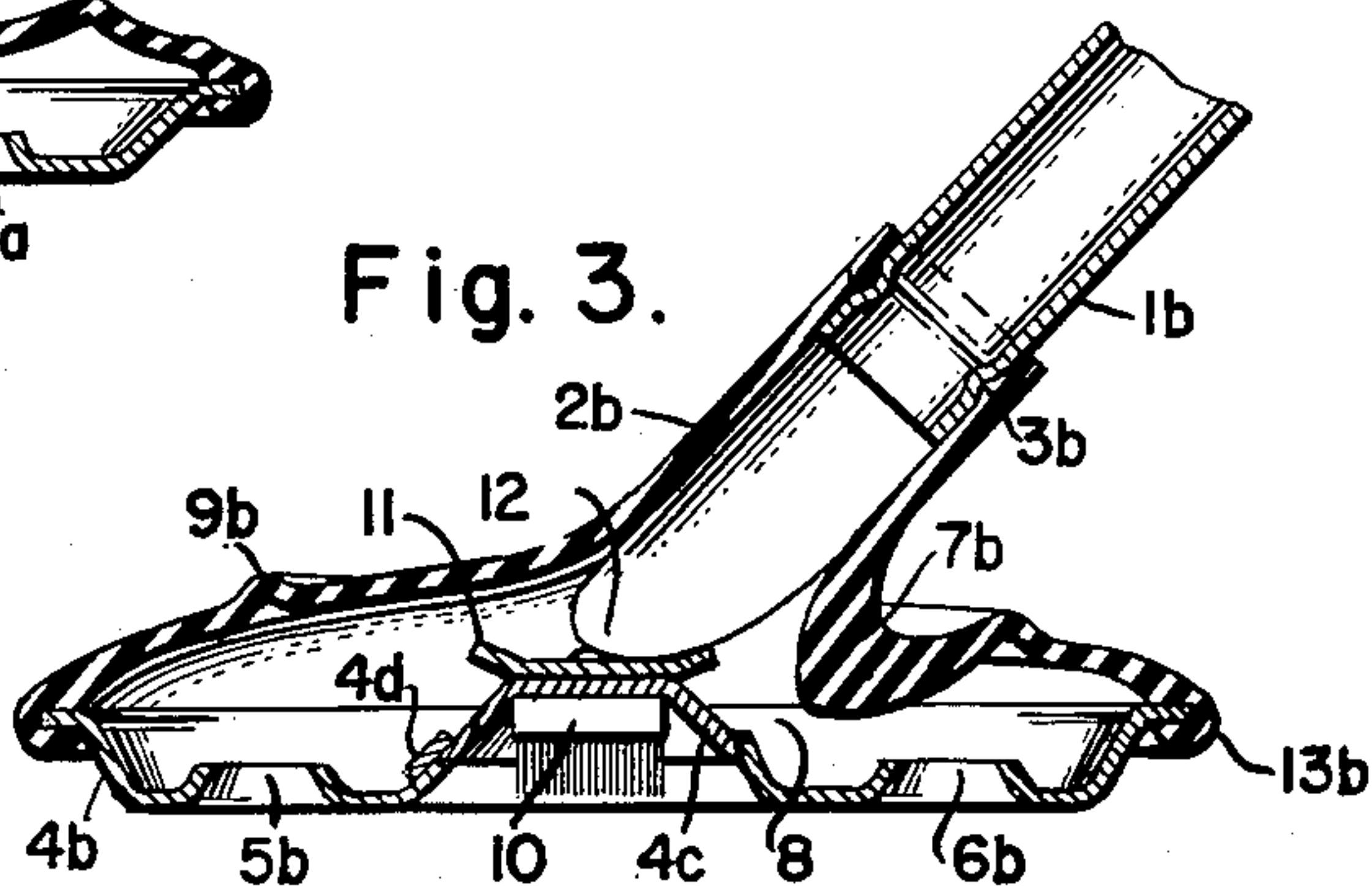
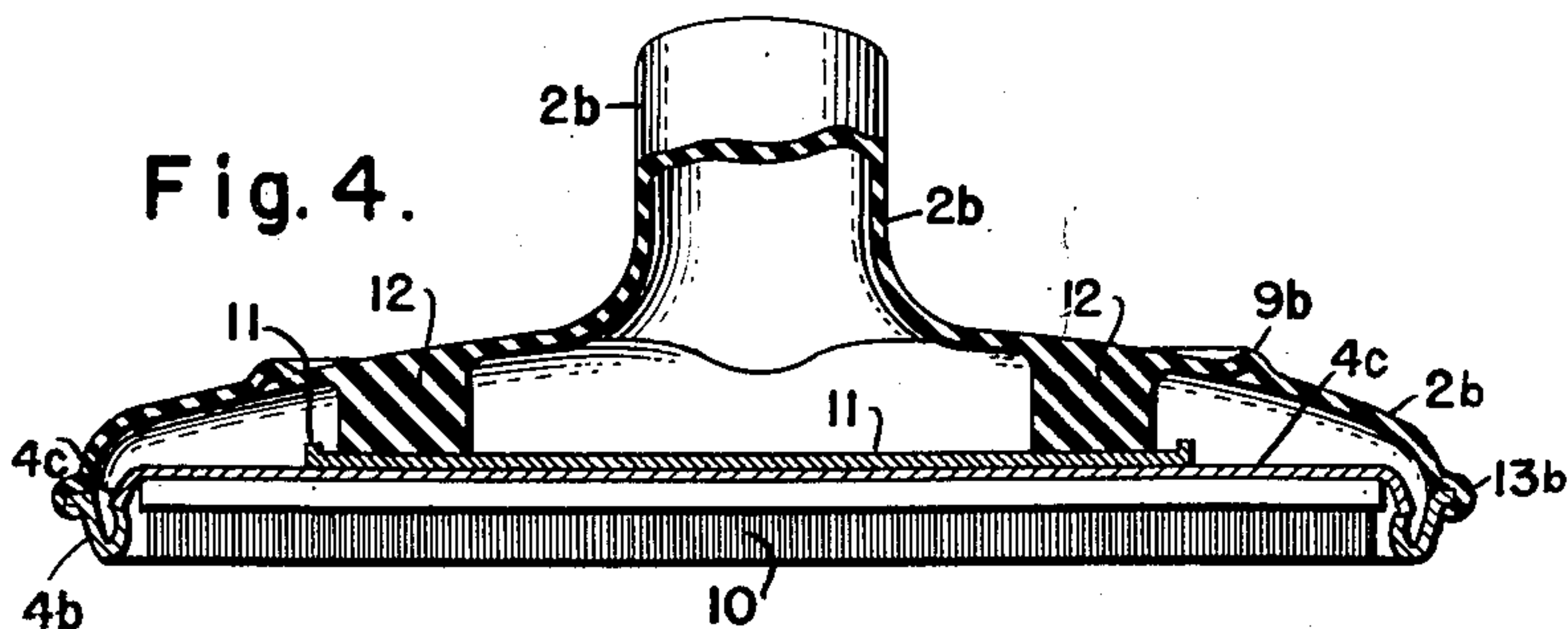


Fig. 4.



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SUCTION NOZZLE FOR SUCTION CLEANERS

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5 Claims. (Cl. 15—373)

1

In order to be able, when using a suction cleaner, to displace the suction nozzle beneath furniture and the like in a simple way, it is usual to provide a hinged junction between the suction nozzle and the suction tube which is to be held in the hand.

The hinged junction, however, introduces difficulties because in all positions it must be air-tight. Moreover, such a hinge allows for rotation in only one plane.

The present invention aims at providing an air-tight universal connection between the nozzle and tube.

The nozzle according to the invention is mainly characterized in that it consists of an upper part of a strong resilient material, for example, rubber, closed at the lower side by a bottom of metal which is provided with one or more suction openings.

The invention will be disclosed and explained by reference to the accompanying drawing which forms part of this specification.

Fig. 1 is a vertical sectional view of one embodiment of the invention;

Fig. 2 is a similar sectional view of another embodiment;

Fig. 3 is a vertical sectional view of a further modification; and

Fig. 4 is a transverse view in sectional elevation of the nozzle shown in Fig. 3.

The mechanism of Fig. 1 comprises a suction nozzle, which can be pushed onto a tube 1, and which has the usual external shape. However, according to the invention, the nozzle comprises an upper part 2 of rubber which ends in a short connecting tube 3 which fits onto the tube 1.

The rubber part 2 which is in the nature of a deformable diaphragm ends at the lower side in a circular edge 13, wherein a metal plate 4 is placed. The plate 4 has a flat lower side, which can be moved over the floor and is provided with a central suction opening 5. The part 2 forms an upper mounting part for the plate.

In order to increase the elasticity of the whole, a circular outward bulge 9 is desirably provided around the upper part.

When using a suction cleaner of this kind it is often desirable to increase the suction power locally. This is made possible in a simple way by the embodiment according to Fig. 2. The embodiment of Fig. 2 is generally similar to the embodiment of Fig. 1. Corresponding reference characters have accordingly been applied to corresponding parts with the subscript "a" added in each instance, and no general description will be given.

2

In this embodiment, however, the metal plate 4a is formed in such a way that it is provided with two suction openings or sets of suction openings 5a and 6a, to the front and rear of an intermediate boss. Further, the portion of the rubber part 2a which is situated at the back side between the boss and the rear extremity is formed to provide a thickened inwardly displaced enlargement. This enlargement is indicated at 7. If it is desired to increase the suction power in a certain part of the floor it is possible, by turning the upper part of the tube piece 1a somewhat downward, to push the rubber part 2a at the back side so far downward that the inner part of the part 7 closes or partly closes the free space 8 above the opening 6a and rests on the upper side of the plate 4a by which the back suction opening 6a is closed off, in part at least, from communication with the tube 1a and only the opening 5a remains in operation. This increases the suction power through the opening 5a.

The embodiment of Figs. 3 and 4 is generally similar to the embodiment of Fig. 2. Corresponding reference numerals have accordingly been applied to corresponding parts with the subscript "b" added in each instance, and no general description will be given.

In Figs. 3 and 4, a brush 10 is flexibly supported centrally at the lower side of the plate 4b, which can be operated at will. The brush 10 in its normal position is not in contact with the floor. The central portion of the plate 4b is desirably cut away and is replaced by a central brush supporting section 4c. The section 4c is movably supported through a spring plate 4d.

When it is desirable, in using the suction cleaner, to treat a part of the floor also with the brush, a slight pressure exercised in a vertical direction on the tube piece 1b will result in some ridges 12, arranged in the interior of the suction nozzle, being displaced in a downward direction and thereby exercising a pressure on the upper side of the central part 4c and the edge of an attaching plate 11 which is fixed thereon, so that this central part of the bottom 4b is displaced downward and the brush 10 is pressed upon the floor.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. A suction nozzle for a suction cleaner comprising, in combination, a suction tube, a gener-

3

ally rigid, substantially flat bottom plate having a suction opening therein, the bottom plate extending both laterally and in a fore and aft direction for substantial distances outward from the end of the suction tube, a deformable diaphragm of highly resilient material extending flatwise and covering the entire bottom plate, said diaphragm including a central, integral, tubular extension through which it is connected to the suction tube, said diaphragm with its tubular extension constituting the sole means of connection of the bottom plate with the suction tube, and being sufficiently yielding to enable the suction tube to have limited bodily and universal tilting movement relative to the bottom plate.

2. A suction nozzle for a suction cleaner comprising a rigid substantially flat bottom plate having a surface for engagement with a flooring and one or more suction openings, and forming a bottom part of said nozzle, an upper part formed of a readily distortable resilient material having a neck substantially at the center thereof which forms the only connection between said plate and a suction tube, said upper part covering the bottom plate and having an upper surface extending outwardly from said neck substantially parallel to said first-mentioned surface, said neck being movable by means of a suction tube relatively to said bottom plate so as to distort the upper surface of said upper part relatively to said first-mentioned surface without affecting the relation of said bottom plate to the surface of a flooring with which said plate is in contact, the distance between the forwardmost floor contacting portion of said plate and the rearmost floor contacting portion of said plate and the distance between the lateral extremities of said plate, each being at least several times the vertical distance between the plate and the said upper surface of the upper part.

3. A suction nozzle for a suction cleaner, characterized by a suction tube, a rigid, substantially flat bottom plate having a surface which engages a floor and supports the nozzle, said plate being provided with one or more suction openings, a thin readily distortable upper part of highly resilient material covering the bottom plate and in which said plate is mounted, said upper part having a neck substantially at the center thereof which forms the only connection between the bottom plate and the suction tube, said upper part enabling through its own distortion a substantial movement of the suction tube with respect to the bottom plate to be effected in any selected direction, without affecting the relation of the bottom plate to a floor, said bottom plate including an upwardly displaced, yieldable central section, a brush carried directly by said central section of the bottom plate, said section normally supporting the brush out of contact with a floor engaged by said bottom plate, the upper part being formed with projections engageable with the central brush supporting section of the bottom plate and the brush supporting section being sufficiently yieldable to shift the brush into engagement with a floor engaged by said bottom plate in response to downward pressure exerted from the tube through said upper part.

4. A suction nozzle for a suction cleaner, char-

4

acterized by a suction tube, a rigid, substantially flat bottom plate having a surface which engages a floor and supports the nozzle, said plate being provided with one or more suction openings, a thin readily distortable upper part of highly resilient material covering the bottom plate and in which said plate is mounted, said upper part having a neck substantially at the center thereof which forms the only connection between the bottom plate and the suction tube, said upper part enabling through its own distortion a substantial movement of the suction tube with respect to the bottom plate to be effected in any selected direction, without affecting the relation of the bottom plate to a floor, said bottom plate including a yieldable central section, a brush carried directly by said central section of the bottom plate, said plate section normally supporting the brush out of contact with a floor engaged by said bottom plate, the resilient upper part of the nozzle having ridges displaceable downward in response to downward pressure exerted upon the suction tube and sufficiently rigid when so displaced to depress the central section of said plate, thereby to shift the brush into engagement with a floor.

5. A suction nozzle for a suction cleaner, characterized by a suction tube, a rigid, substantially flat bottom plate having a surface which engages a floor and supports the nozzle, said plate being provided with suction openings, a thin readily distortable upper part of highly resilient material covering the bottom plate and in which said plate is mounted, said upper part having a neck substantially at the center thereof which forms the only connection between the bottom plate and the suction tube, said upper part enabling through its own distortion a substantial movement of the suction tube with respect to the bottom plate to be effected in any selected direction, without affecting the relation of the bottom plate to a floor, said bottom plate having said suction openings situated to the front and rear of the transverse axis of the nozzle, the resilient upper part of the nozzle above a rear suction opening having a thickened enlargement displaceable downward in response to downward tilting of the suction tube to engage the bottom plate forwardly of such rear opening, thereby to close off air flow, in part at least, from the rear opening to the suction tube.

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