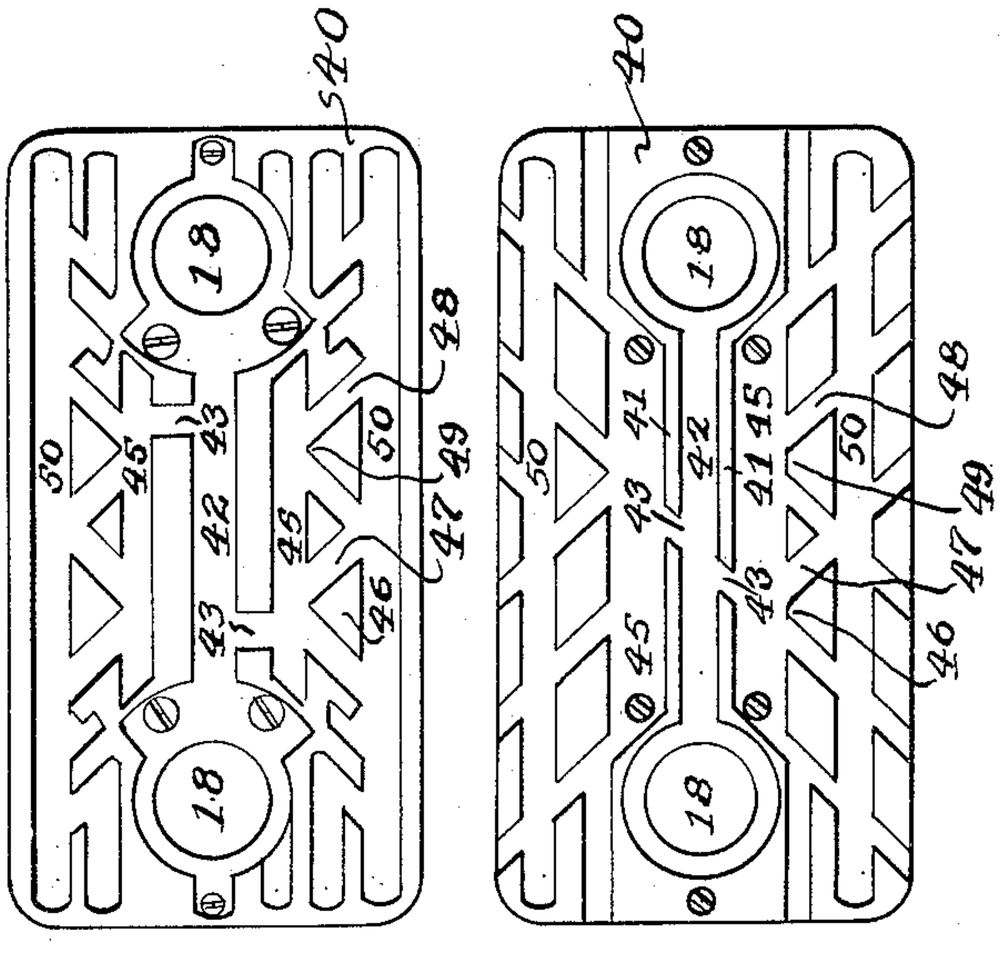
Oct. 31, 1950 K. A. KENDRICK 2,528,278

NOZZLE FOR SUCTION CLEANERS

Filed Aug. 11, 1945 2 Sheets-Sheet 1

Fig. 5



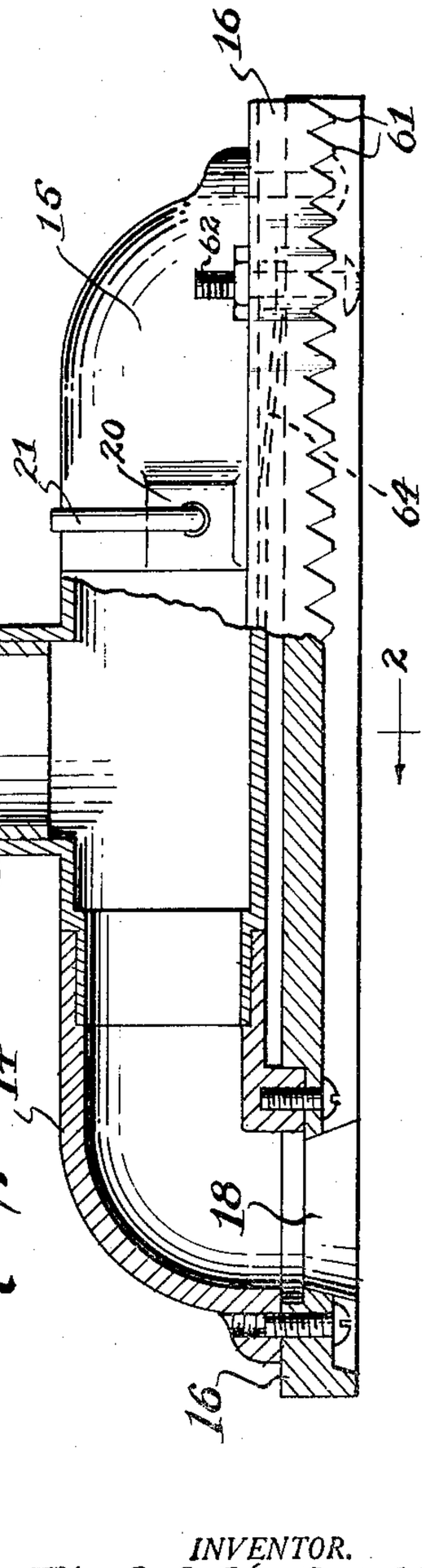


Fig. 4

Fig. 1

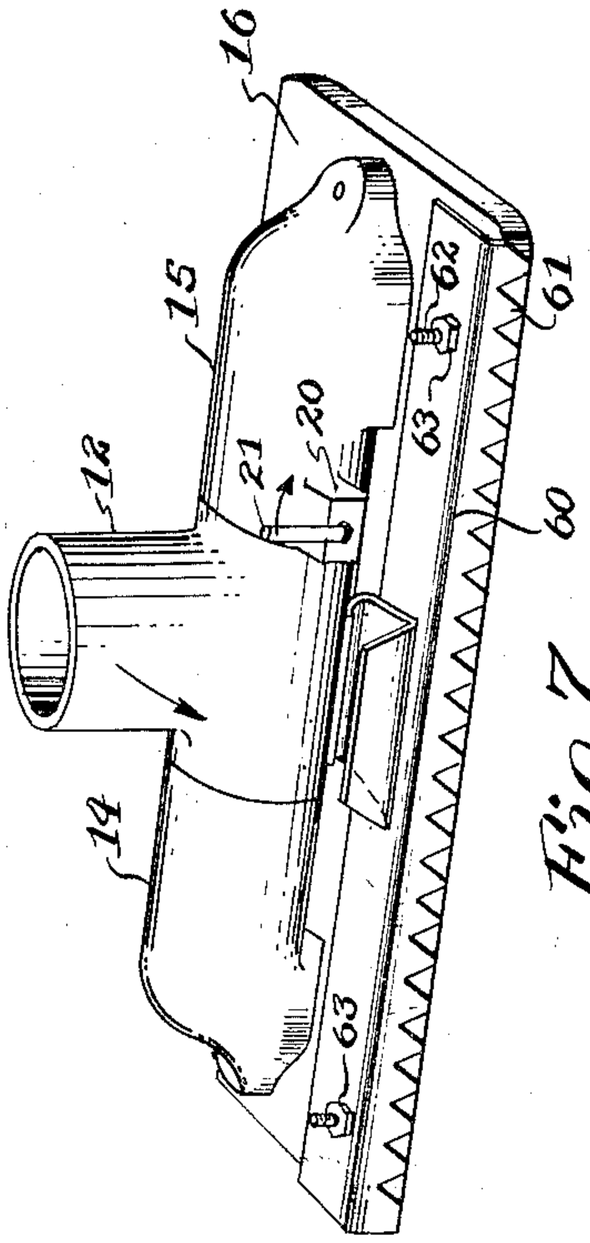


Fig. 7

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Oct. 31, 1950 K. A. KENDRICK 2,528,278

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Filed Aug. 11, 1945 2 Sheets-Sheet 2

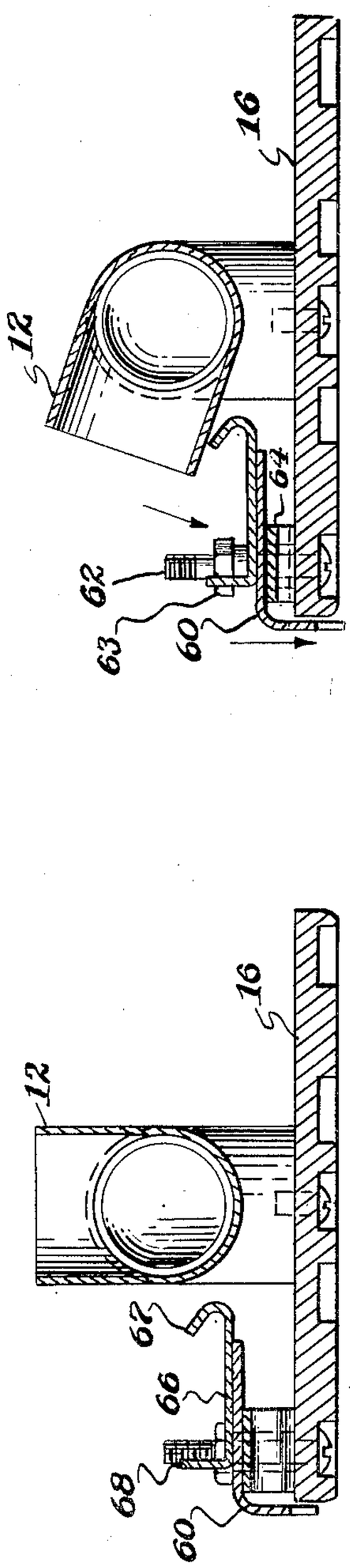

Fig. 3

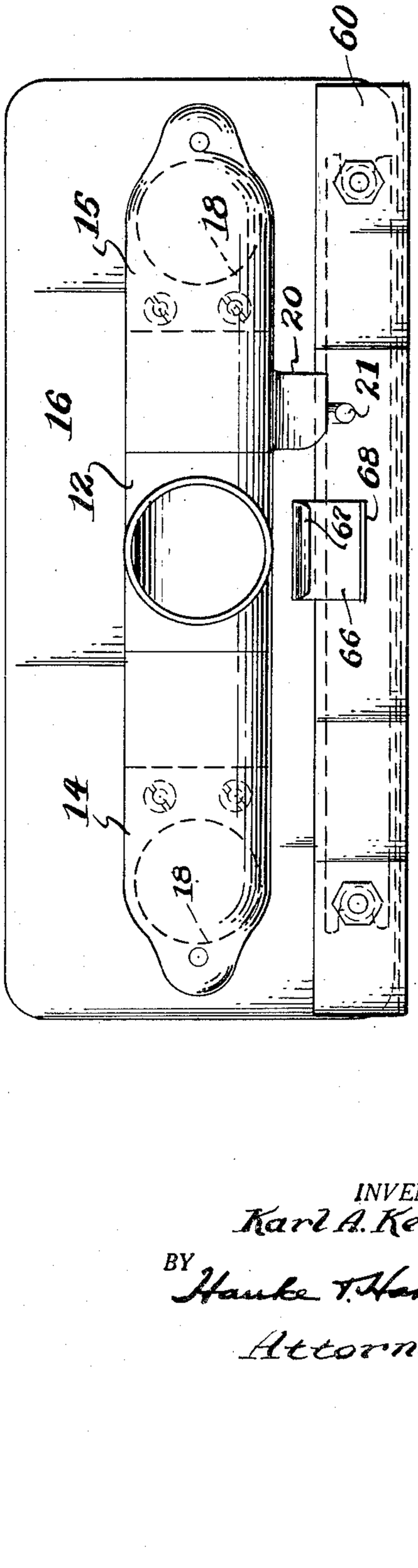

Fig. 6

Fig. 2

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2,528,278

NOZZLE FOR SUCTION CLEANERS

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Application August 11, 1945, Serial No. 610,276

2 Claims. (Cl. 15—420)

1

This invention relates to nozzles for vacuum cleaners and the like, being particularly concerned with the construction of nozzles for use with remotely located suction apparatus, the parts being connected by a hose or tube which also, at least in part, constitutes the handle for the nozzle.

A further object is the provision of a nozzle construction having a relatively large active surface area, all of which is rendered effective by reason of the novel provision of suction channels so distributed thereover and so interconnected as to define areas of relatively lower and higher suction, the high suction area being concentrated in a narrow transverse channeled section extending across the mid portion of the nozzle surface, while the lower suction areas are arranged farther from the center, also defined by channels extending entirely across the nozzle, certain of the channels having ends exposed at the front and back edges of the nozzles. A related object is to incorporate dividing partitions between the suction channels, which partitions also include portions constituting teeth adapted to loosen matter adhering to the surface being cleaned, the teeth being flush with the bottom of the nozzle and so arranged that they can not injure or catch upon delicate materials.

In the drawings:

Fig. 1 is a view partly in central section and partly in side elevation of a vacuum cleaner nozzle incorporating the principles of this invention.

Fig. 2 is a transverse section taken substantially on the line 2—2 of Fig. 1, and looking in the direction of the arrows.

Fig. 3 is a view similar to Fig. 2 but with the parts in a different position.

Fig. 4 is a bottom plan view of the cleaning plate certain parts shown in the figures being omitted.

Fig. 5 is a bottom plan view of a modified form of cleaning plate certain parts shown in the figures being omitted.

Fig. 8 is a top plan view of the nozzle structure and

Fig. 7 is a perspective view thereof.

Referring now to the drawings, it will be seen that the head of the nozzle, through which the air is conducted, via a hollow handle 10 or the like, is comprised of tubular or pipe sections assembled and rotatable with relation to each other. These include an inverted T 12 and a pair of elbows 14—15, the cross head portion of the T extending into and being rotatable

2

but substantially sealed with respect to the elbows. The elbows are at their other ends secured to a plate 16, openings 18 being provided in the plate through which the elbows project, and in which they may be secured by welding or otherwise.

One of the elbow sections, as 15, is provided with a lug or boss 20, tapped for the reception of a set screw conveniently extended into a handle portion 21, by means of which the T 12 may be fixed against rotation when desired.

As best shown in Figs. 2, 3, 6 and 7, the plate 16 extends the full length of the nozzle construction, and projects at its ends beyond the elbows and forms the cleaning head. My preferred cleaning head for surfaces, such as rugs and floors, which do not require brushing, is of flat, plate-like construction, of hard material, such as metal or hard rubber.

Referring to Fig. 4, it will be seen that the bottom of the plate forming the cleaning head is grooved to provide air channels arranged in a novel manner to restrict and control the air flow through and from the various parts of the surface against which the plate is pressed, this being effected by controlling the flow of air to the eduction openings 18, in a manner which is also dependent upon the permeability of the surface being cleaned, and the tightness with which the plate is pressed against it. Surrounding the openings 18 wall portions as 40 are provided. It will be seen that this and the other wall or baffle portions may constitute substantially the thickness of the plate, which is channeled and relieved to define them, either by machining or casting. Openings 18 communicate only with a narrow channel 42 extending transversely of the plate and connecting such two openings. Walls 41 bounding channel 42 are relieved only by small lateral cut-out openings 43, which greatly restrict communication with the remainder of the plate when the latter is pressed against the surface being treated. Channel 42 will be seen to constitute the area of highest vacuum, while on either side of such channel, separated therefrom by the walls 41, are channels 45 of lesser vacuum, which also extend across the plate. When the plate is pressed against a surface to which it conforms, air may be drawn from the channels 45 only through the openings 43, although it will be understood that ordinarily some air also flows between the walls 41 and the surface being cleaned, and directly through the material being cleaned. Channels 50 of lower vacuum are pro-

vided nearer the front and the back edges of the plate, between which and the intermediate vacuum channels 45 angularly disposed connecting channels as 47—48 are provided, intersecting each other in such fashion as to form upon the surface of the plate teeth portions having angular ends, as 46—49, the bottoms of such teeth portions being flush with and forming part of the surface of the plate. These and the other wall-defining portions between the channels 42—45—50, lying in a common plane. Channels 47—48 extend to the edges of the plate, as also do portions of the channels 45, providing effective air paths through which air and dirt may be drawn directly from the edges of the plate. This arrangement greatly facilitates cleaning in corners, close to walls, furniture and other objects.

Considering the entire channel arrangement, it will be appreciated that their decreasing proportionate area as the distance from the inlet openings 18 becomes greater, insures relatively high air velocity, and consequently more effective cleaning. This, together with the teeth formed by the angular intersecting channels, insures effectively loosening lint, threads and other objects sticking to the nap of the material, so that when the high vacuum portion is passed thereover, if not before, such things are readily removed and drawn into the cleaner.

In addition to the dirt loosening teeth 46—49, it is also sometimes desirable to provide a more positive nap agitation or scraping action so as to effectively dislodge material adhering tightly to the surfaces being cleaned.

Such agitation and scraping is accomplished by the element shown best in Figs. 1, 6 and 7. In these figures, the nozzle structure is shown as provided with an L-section plate 60 overlying one longitudinal edge of the plate 16 and extending downwardly along such edge, this depending portion being provided with blunt teeth 61.

The plate 60 is carried on suitable studs 62 on which it slides freely up and down, being limited in its upward movement by the nuts 63 and supported in its upward position by a suitable flexible spring 64. In its upper position, the teeth 61 are well above the level of the bottom face of the nozzle, as indicated in Fig. 2, but when the plate is pushed down, the teeth 61 extend slightly below such face as shown in Fig. 3.

This movement of the plate 60 is accomplished by fixing to its upper side a small plate 66 having its forward edge 67 turned up and curved over as shown in Figs. 2 and 3 and its rear edge also turned up as at 68, so that when the T 12 is rotated downwardly, it strikes these edges 67—68, or one of them, and presses down the plate to the position of Fig. 3. Of course, as soon as the T is moved up again, the plate 60 immediately rises.

Fig. 5 illustrates a modified form of the nozzle of Fig. 4 in which the modification consists chiefly in providing a continuous ridge 70 around the outer edge of the nozzle face.

The present application is being filed to take the place of abandoned application Serial No. 122,105, filed January 25, 1937.

I claim:

1. A nozzle member for suction cleaners and the like, comprising a plate having a substantially flat bottom surface, a pair of spaced air eduction openings extending therethrough, a channel connecting said openings, an additional channel extending transversely of the plate and spaced from said first mentioned channel, means providing restricted communication between said channels, a third channel spaced from both of said first mentioned channels, and additional connecting channels providing restricted communication between the last-mentioned channel and the second mentioned channel, all of said channels being open to the said bottom surface.

2. A nozzle member for suction cleaners and the like, comprising a plate having a substantially flat bottom surface, a pair of spaced air eduction openings extending therethrough, a channel connecting said openings, an additional channel extending transversely of the plate and spaced from said first-mentioned channel, means providing restricted communication between said channels, a third channel spaced from both of said first mentioned channels, and a plurality of additional connecting channels providing restricted communication between and obliquely intersecting the last mentioned channel and the second mentioned channel, and diverging from said first mentioned channel, said additional communicating channels providing a greater area of communication between said second and third mentioned channels than between the first and second mentioned channels, all of said channels being open to the said bottom surface.

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