Sept. 14, 1965 C. T. FROMKNECHT ETAL 3,205,528

VACUUM CLEANER NOZZLE

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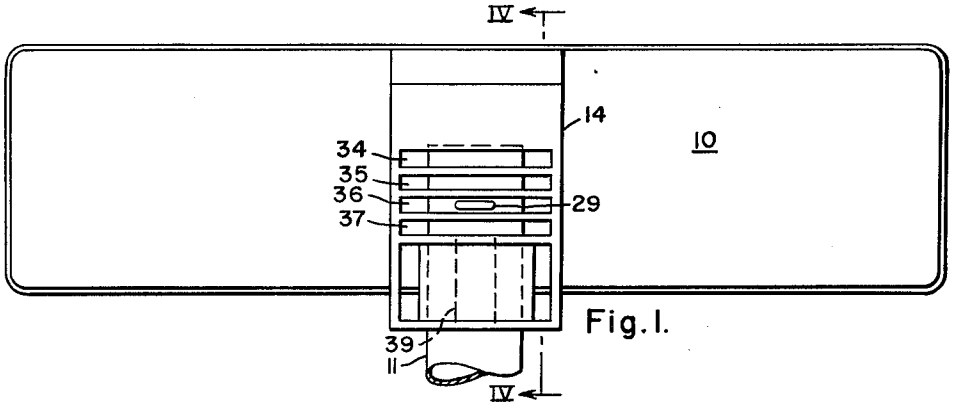


Fig. 1.

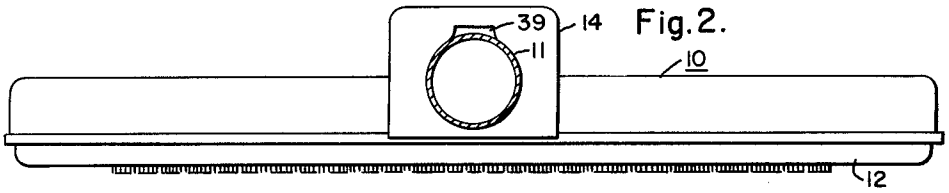


Fig. 2.

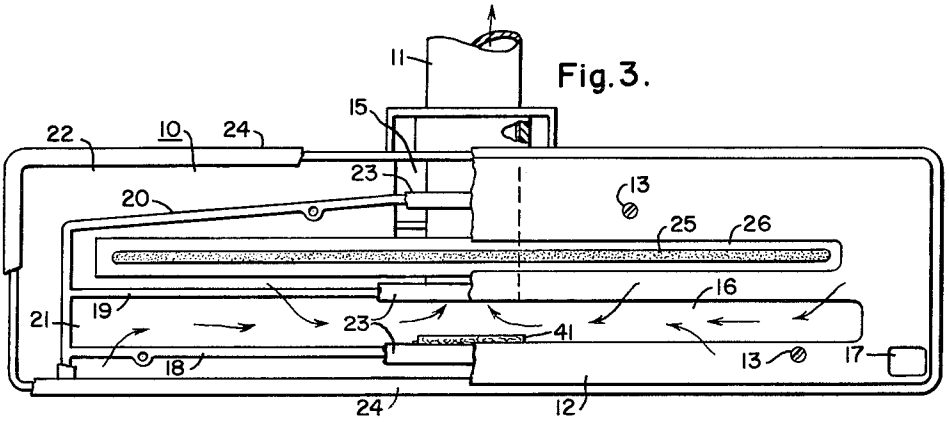


Fig. 3.

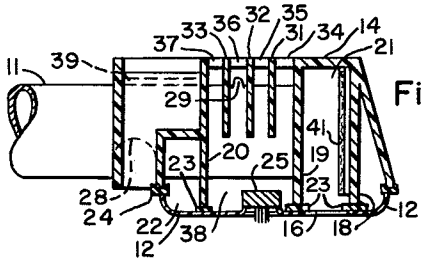


Fig. 4.

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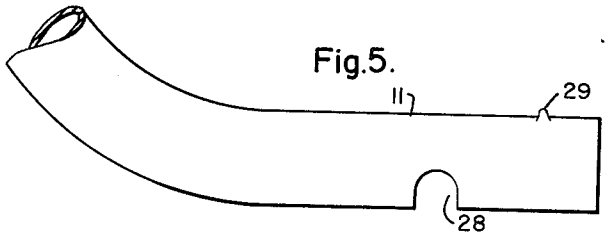
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Fig.5.



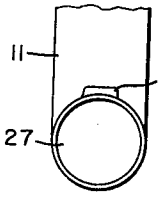


Fig.6.

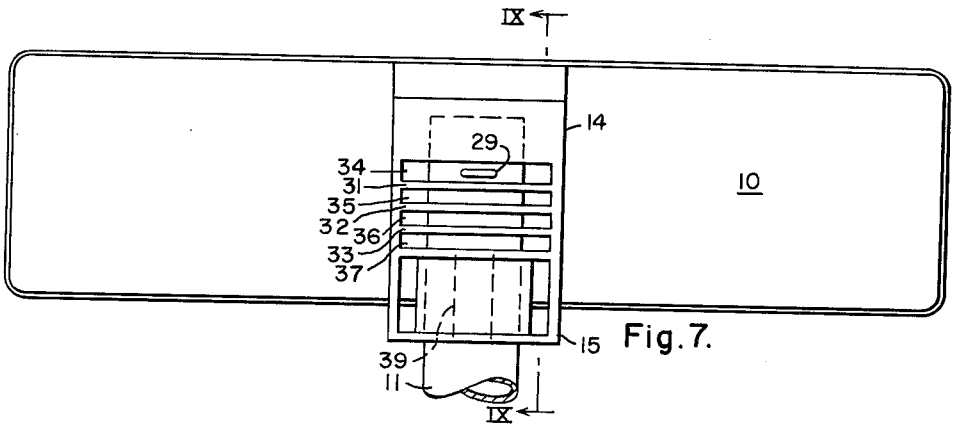


Fig.7.

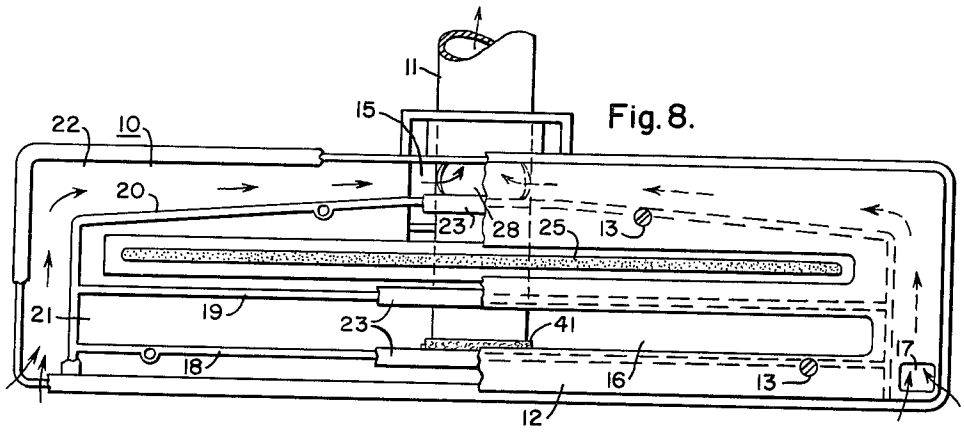


Fig.8.

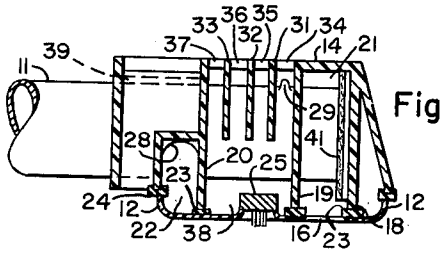


Fig.9.

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3,205,528

VACUUM CLEANER NOZZLE

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4 Claims. (Cl. 15—416)

This invention relates, generally, to vacuum cleaners and, more particularly, to nozzles for vacuum cleaners.

Vacuum cleaner nozzles of the usual type do not clean well along walls and in corners. This is because they do not have adequate air suction at the edges of the nozzles. However, adequate suction can be obtained by concentrating all of the available suction at the edges of a nozzle.

An object of this invention is to provide a vacuum cleaner nozzle which can be adjusted to concentrate its air cleaning power at desired locations, such as the edges of the nozzle.

Another object of the invention is to provide a means for readily adjusting a vacuum cleaner nozzle to have either normal suction or concentrated suction.

A further object of the invention is to provide a combined means for holding the nozzle adjusting means in a selected position and for indicating the type of suction for which the nozzle is adjusted.

Other objects of the invention will be explained fully hereinafter or will be apparent to those skilled in the art.

In accordance with one embodiment of the invention, a vacuum cleaner nozzle, the face of which is generally rectangular, has a relatively large generally rectangular opening in the face for normal suction and a relatively small opening at each forward corner of the face for concentrated suction. The position of a tube for connecting the nozzle to a cleaner wand relative to air passages from the nozzle openings determines whether the suction is normal or concentrated. A projection on the connector tube cooperates with slots in the nozzle housing to retain the tube in selected positions and to indicate the type of suction for which the nozzle is adjusted.

For a better understanding of the nature and objects of the invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a view, in plan, of a vacuum cleaner nozzle and a portion of a connector tube embodying principal features of the invention, the tube being in position for normal suction;

FIG. 2 is a view, in rear elevation, of the nozzle and tube portion shown in FIG. 1;

FIG. 3 is a view, in bottom plan, of the nozzle, a portion being broken away for clearness;

FIG. 4 is a view, in section, taken along the line IV—IV in FIG. 1;

FIG. 5 is a view, in side elevation, of a portion of the connector tube;

FIG. 6 is a view, in end elevation, of the connector tube;

FIGS. 7 and 8, are views, similar to FIGS. 1 and 3, respectively, showing the connector tube in position for concentrated suction, and

FIG. 9 is a view, in section, taken along the line IX—IX in FIG. 7.

Referring to the drawing, and particularly to FIGS. 1, 2 and 3, the vacuum cleaner nozzle shown therein comprises a generally rectangular body portion **10**, a removable connector tube **11** and a bottom plate **12** which constitutes the bottom face of the nozzle and is removably attached to the body **10** by screws **13**. The body **10**

may be molded from a suitable metal or a suitable plastic material.

As shown most clearly in FIGS. 1 and 2, the body has an integrally formed enlarged housing portion **14** for receiving the connector tube **11**. The tube **11** may be utilized to connect the nozzle to a cleaner and wand which, in turn, is connected to a suction device by a flexible hose of the usual type. The enlarged portion **14** extends to the rear of the body to provide a sealed chamber **15** for a purpose which will be explained more fully hereinafter.

As shown most clearly in FIG. 3, the bottom plate **12** has a relatively large, generally rectangular opening **16** therein which is the opening for normal air suction through the nozzle. The bottom plate **12** also has a relatively small opening **17** at each forward corner of the plate. The openings **17** are for concentrated air suction through the nozzle. The body **10** has integrally formed partitions **18**, **19** and **20** which provide a passage **21** from the normal suction opening **16** and a pair of passages **22** from the concentrated suction openings **17**, only one of the passages **22** being shown. Sealing gaskets **23** are provided on the edges of the partition members **18**, **19** and **20** between the bottom plate **12** and the partition members. A similar gasket **24** is provided around the outer rim of the body **10** between the bottom plate **12** and the body. A brush **25** may be mounted in the body if desired. The bristles of the brush **25** extend through an opening **26** in the bottom plate **12**.

As shown most clearly in FIGS. 5 and 6, the connector tube **11** has an opening **27** in one end thereof and an opening **28** in one side of the tube at a predetermined distance from the end of the tube. The tube **11** also has an integrally formed or stamped projection **29** on the side of the tube opposite the opening **28** and located between the opening **28** and the end of the tube having the opening **27**. As previously explained, the other end of the tube **11** may be connected to a cleaner wand (not shown).

As shown most clearly in FIGS. 1 and 4, the enlarged housing portion **14** of the body **10** has a plurality of spaced ribs **31**, **32** and **33** disposed between partitions **19** and **20** of the body. Slots **34**, **35**, **36** and **37** are provided between the ribs and the partition members. As shown in FIG. 4, the ribs **31**, **32** and **33** do not extend the full depth of the housing **14**, thereby providing a space **38** between the lower ends of the ribs and the bottom of the housing. A groove **39** extends to the rear of the housing **14** from the partition **20**.

In order to adjust the nozzle to obtain either normal suction or concentrated suction, as desired, the position of the connector tube **11** relative to the air passages **21** and **22**, which communicate with the openings **16** and **17**, respectively, is changed in the housing portion **14** of the body **10**. The tube **11** is rotatably disposed in the housing **14** and it may be moved longitudinally in the housing. When the tube **11** is in the position shown in FIGS. 1, 3 and 4 with the projection **29** disposed in the slot **36** between the ribs **32** and **33** the tube communicates with the air passage **21** for the opening **16** which, as explained hereinbefore, provides normal suction through the nozzle. As shown by the arrows, the end of the tube **11** communicates with the air passage **21** to permit air to enter the tube through the opening **27** in the end of the tube. The opening **28** in the side of the tube is disposed in the chamber **15** which is sealed to prevent air from entering the tube through the opening **28**.

In order to adjust the nozzle for concentrated air suction, the tube **11** is changed to the position shown in FIGS. 7, 8 and 9. The position of the tube is changed by first rotating the tube through an angle of approxi-

mately 90° to put the projection **29** in the space **38** below the ends of the ribs in the housing **14** and then moving the tube longitudinally until the projection **29** is between the rib **31** and the partition **19** of the housing after which the tube is rotated to place the projection **29** in the front slot **34**. When the tube is in this position the front end of the tube is compressed against a gasket **41** on the partition **18** of the housing, thereby preventing air from entering the tube through the opening **27**.

As shown in FIGS. 8 and 9, the opening **28** in the tube **11** communicates with the air passage **22** to permit air to be drawn through the openings **17** in the bottom face plate **12**. Since the openings **17** are small in size compared with the opening **16**, concentrated suction is obtained through these openings.

Furthermore, the openings **17** are located at the forward corners of the nozzle where they are most effective in cleaning along walls and in corners. Thus, the type of suction obtained is determined by the position of the tube **11** which communicates with the different air passages from the normal suction opening **16** and the concentrated suction openings **17**. If the tube **11** is moved to a position in which the projection **29** is in the slot **35** between the ribs **31** and **32**, the air flow obtained is a compromise between normal suction and concentrated suction since the tube will communicate with both air passages **21** and **22**.

The tube **11** may be removed from the housing **14** by rotating the tube to place the projections **29** in the space **38**, moving the tube longitudinally until the projection **29** engages the partition **20**, then rotating the tube to place the projection **29** in the slot **37** and then withdrawing the tube with the projection **29** passing through the groove **39**. The tube may be inserted in the housing by reversing the foregoing operation.

In order that the projection **29** will function as an indicator to indicate the type of suction for which the nozzle is adjusted, markings or labels are provided on the top of the nozzle **10** adjacent to the slots in the top of the housing portion **14** of the nozzle. The projection **29** is visible from above the nozzle through the slots in the housing. Thus, the operator can tell the type of suction for which the nozzle is adjusted by observing the position of the projection **29** in the slots. In this manner, the projection **29** cooperates with the housing to retain the connector tube in position in the housing to obtain the desired suction and also to indicate the type of suction for which the nozzle is adjusted.

From the foregoing description it is apparent that the invention provides for adjusting a vacuum cleaner nozzle to obtain air suctions of different types and to concentrate the air suction at desired sections of the nozzle. Provision is also made for inserting a connector tube into the nozzle and retaining it at the desired position in the nozzle. An indicator is provided to show the position of the tube and the type of suction for which the nozzle is adjusted.

Since numerous changes may be made in the above described construction and different embodiments of the invention may be made without departing from the spirit and scope thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim as our invention:

1. In a nozzle for a vacuum cleaner having a suction device, in combination, a body having a generally rectangular face, a relatively large generally rectangular opening in the face for normal suction, a relatively small opening at each forward corner of the face for concentrated suction, separate air passage means in said body from said openings, a connector tube for connecting the nozzle to the suction device, said tube having an opening in one end for communicating with the normal suction opening through a first selected air passage means, an

opening in the side of the tube for communicating with the concentrated suction openings through another selected air passage means, said tube being rotatable and movable longitudinally in said body, said nozzle including means responsive to such movement to establish communication selectively between the interior of said tube and said first or said another air passage means.

2. In a nozzle for a vacuum cleaner having a suction device, in combination, a body having a generally elongated face, a relatively large generally central opening in the face for normal suction, a relatively small opening at each end of the face for concentrated suction, first and second air passage means in said body from said openings, a connector tube for connecting the nozzle to the suction device, said connector tube having air admission means for communicating with the normal suction opening through said first air passage means, said air admission means being further adapted to communicate with the concentrated suction openings through said second air passage means, said tube being rotatable and movable longitudinally in said body, said nozzle including means responsive to such movement to establish communication selectively between the interior of said tube and said first or said second air passage means.

3. In a nozzle for a vacuum cleaner having a suction device, in combination, a body having a generally rectangular face, a relatively large generally rectangular opening in the face for normal suction, a relatively small opening at each forward corner of the face for concentrated suction, separate air passage means in said body from said openings, a connector tube for connecting the nozzle to the suction device, said tube having a first opening for communicating with the normal suction opening through a selected air passage means, said tube having a second opening for communicating with the concentrated suction openings through another selected air passage means, said tube being rotatable and movable longitudinally in said body, said nozzle including means responsive to such movement to establish communication selectively between the interior of said tube and one or the other of the air passage means.

4. A nozzle for a vacuum cleaner having a suction device, said nozzle comprising a body having a relatively large opening therein for normal suction and a relatively small opening for concentrated suction, separate air passages in said body from said openings, a plurality of spaced ribs with slots therebetween depending from one wall of said body and extending approximately half the distance between said one wall and an opposite wall thereby providing a space between the free ends of the ribs and the opposite wall, a connector tube for connecting the nozzle to the suction device, a projection on said tube, said tube being rotatable in said body for positioning said projection in said space whereby said tube is movable longitudinally in said body for selecting the desired suction opening, said projection being adapted upon rotation out of said space to cooperate with said ribs to retain said tube in communication with the selected opening.

References Cited by the Examiner

UNITED STATES PATENTS

1,140,462	5/15	Johnson.	
1,860,854	5/32	Engberg et al.	15—416
2,048,273	7/36	Ljungquist	15—416
2,131,548	9/38	Barrner.	
2,219,802	10/40	Bjorkman	15—418
2,274,560	2/42	Ott	15—416
2,348,861	5/44	Smellie	15—377 X
2,620,506	12/52	Weiland	15—411 X
2,824,334	2/58	Laningham	15—416 X

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