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VACUUM CLEANER NOZZLE

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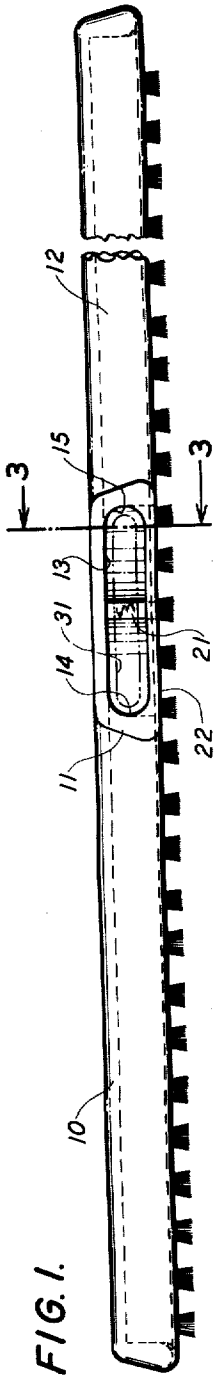


FIG. 1.

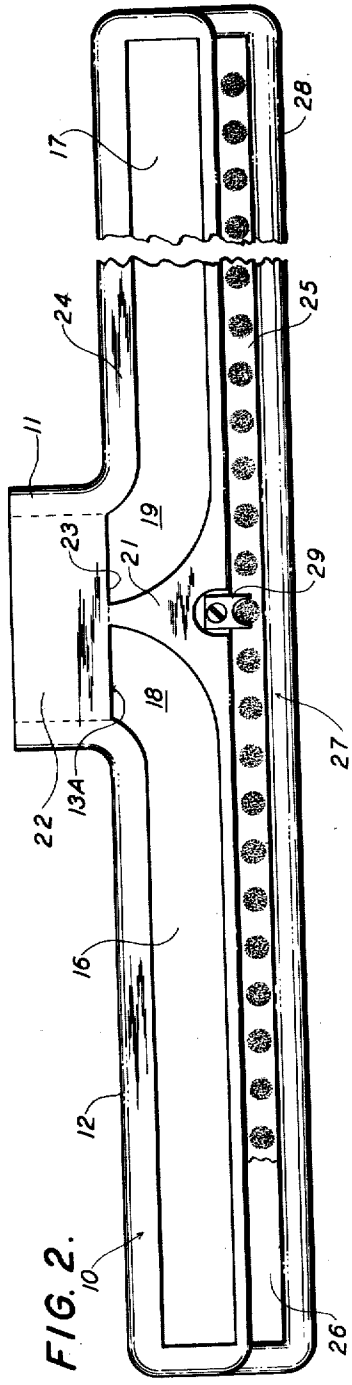


FIG. 2.

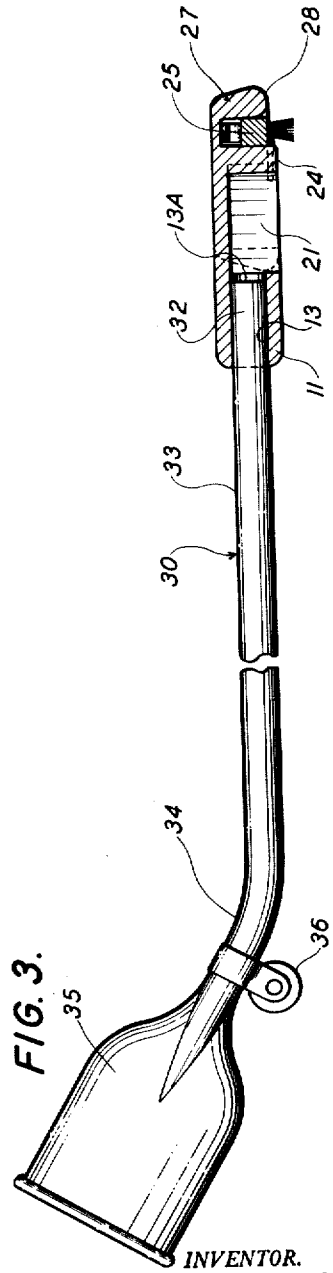


FIG. 3.

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VACUUM CLEANER NOZZLE

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6 Claims. (Cl. 15—400)

This invention relates to vacuum cleaners and particularly to a suction attachment for application in restricted or confined areas.

Vacuum cleaning under low objects such as divans and other overstuffed furniture pieces has never been efficient or convenient either because effective attachments of appropriate dimensions were not available, or because attachments were not capable of cleaning the rear areas under wide objects.

The attachment of the invention achieves efficient cleaning of such areas because its unique design results in a minimum height and great mobility.

The vacuum cleaner attachment of the invention comprises a rectangular body in the form of a long and flat rectangular parallelepiped having a top and bottom surface defined by its length and width, a front and a back side surface defined by its length and height, two end surfaces defined by its width and height. The body has a central horizontal projection having the same vertical dimension as the body. The projection defines a suction throat of approximately rectangular vertical cross-section. The body includes a pair of oppositely extending suction channels opening into the throat.

The term: "approximately rectangular vertical cross-section" includes those cross-sectional shapes having one dimension that is appreciably greater than the opposite dimension, and includes a rectangle with rounded corners. In the attachment of the invention the largest of the dimensions is in the horizontal plane.

The configuration of the suction throat permits use of connecting means between the throat and the suction end of a vacuum cleaner that gives the attachment full cleaning range under low objects of more than average width.

Preferably the connecting means comprises a long tube that, for most of its length beginning at the end that fits tightly into the suction throat of the attachment, has a cross-section approximating that of the throat. Near its other end the tube curves upwardly and flares out to form a socket providing for connection to a vacuum cleaner extension tube.

The advantages of the invention will be more clearly understood by reference to the following detailed description and drawing in which:

Fig. 1 is a fragmentary elevation of a preferred form of the invention;

Fig. 2 is a bottom plan view of the embodiment of Fig. 1; and

Fig. 3 is a partial sectional view of the assembled tube and attachment, taken along line 3—3 of Fig. 1.

Referring to Figs. 1 and 2, the vacuum cleaner attachment has a rectangular body **10** which may, for example, have a vertical thickness of approximately one-half inch or less. The body has a horizontal projection **11** that is located at the approximate midpoint of a long side **12** of the body. The projection has the same vertical thickness as the body and defines a substantially rectangular suction throat **13** that has rounded side walls **14, 15.**

The suction throat extends at right angles to the long side **12** of the body, and as is apparent from the drawings, the suction throat effectively surrounds or defines an opening through the side **12** of the body to which a pair of channels **16, 17** communicate.

A pair of channels **16, 17** are formed in the body opening at the lower face thereof and together extending substantially the entire length of the body. The channels curve rearwardly at **18, 19** to meet the suction throat at the central portion of the body, the curved portions of the channels being defined by a divider section **21** of the body.

Since the greatest suction effect normally would be at the throat entry **13A**, the division of the suction channels increases the efficiency of the attachment. The divider **21** tends to restrict the suction-induced air flow in this area so that there is a compensating increase in air flow from the outward portions of the channels.

Bottom wall **22** of the throat has a terminating edge **23** at the juncture of the throat with the channels. The outer surface of wall **22** is in the same plane as the smooth rim **24** surrounding the suction channels.

A brush **25** is mounted in a groove **26** that extends across a forward portion **27** of the body and substantially parallel to the reach of channels **16, 17.** The forward portion of the body has a lesser vertical dimension than the rest of the body and a rounding rim **28** is provided on the lower leading edge. A keeper **29** is recessed into the body for holding the brush in the groove.

The utility of the above described attachment is increased when it is used in conjunction with a cooperating connecting tube **30.** Fig. 3 illustrates the assembly of the two elements. The cross-sectional configuration of one end **32** of the tube is shown by broken line **31** in Fig. 1. The end **32** of the tube has an outer configuration similar in size and shape to the throat **13** so that a tight seal exists when the two are mated.

The tube retains this outer configuration through a straight shank portion **33** and through a curved portion **34.** The curve gives an upward tilt of approximately thirty degrees to the tube and leads into a flared socket **35** displaced sufficiently from the floor to prevent its greater vertical dimension from tilting the tube and attachment. Socket **35** may conveniently be connected to a tapered metal end of a flexible hose of a conventional vacuum cleaner (not shown).

The tube is long enough to propel the attachment under low objects into those rear areas that could not heretofore be reached conveniently by efficient cleaning attachments.

The tube has a roller **36** at its upwardly curving portion to lessen the friction between floor and tube and to stabilize the approach angle of the attachment. The roller is preferred for these reasons but is not necessary to the operation of the invention.

In operation the illustrated attachment is attached to the end of a conventional suction cleaner extension hose as by means of the described connecting tube. Because of its novel design and consequent relatively small vertical dimension, the attachment is readily projected into confined spaces heretofore virtually inaccessible to conventional cleaning equipment. Effective cleaning air flow is insured throughout the comparatively wide reach of the attachment by the construction of the air channels therein and as previously described. The attachment is passed over the area to be cleaned either by manipulation of the connecting tube or the adjacent hose with the brush acting in the usual manner to increase the effectiveness of the suction cleaning.

I claim:

1. A vacuum cleaner attachment comprising a suction

head in the form of a flat and elongated rectangular body having a closed top and having a pair of oppositely extending channels which open through the bottom of the body throughout their length, the body also having an opening through one of its sides to which the channels communicate, the opening being located at a position about midway along the length of the body, a throat connected to the body for coupling the suction head to a vacuum cleaner, the throat abutting against the side of the body and surrounding said opening with the height and upper surface of the throat being substantially the same as those of the body, and a divider substantially separating the two channels where they enter said opening, the divider providing a restriction in the suction head to restrict the suction-induced flow of air in the portions of the two channels which are adjacent the opening.

2. A vacuum cleaner attachment comprising a suction head in the form of a flat and elongated rectangular body having a closed top and having a pair of oppositely extending channels of approximately uniform size and which open through the bottom of the body throughout their length, the body also having an opening through one of its sides to which the channels communicate, the opening being located at a position about midway along the length of the body, a flat tubular throat connected to the body, the throat abutting against the side of the body and surrounding said opening with the height and upper surface of the throat being substantially the same as those of the body, a divider substantially separating the two channels where they enter said opening, the divider providing a restriction in the suction head to restrict the suction-induced flow of air in the portions of the two channels which are adjacent the opening, and means for detachably connecting the throat to the suction end of a vacuum cleaner.

3. The apparatus described in claim 2 wherein the connecting means comprises a long, substantially straight flat tube, one end of the tube being accommodated by the throat and the other end of the tube curving upward and flaring out into a cylinder for accommodating the suction tube from a vacuum cleaner.

4. A vacuum cleaner attachment comprising a suction head in the form of a flat and elongated rectangular body having a closed top and having a pair of oppositely extending channels which open through the bottom of the body throughout their length, the body also having an opening through one of its sides to which the channels communicate, the opening being located at a position about midway along the length of the body, a throat connected to the body for coupling the suction head to a vacuum cleaner, the throat abutting against the side of the body and surrounding said opening with the height and upper surface of the throat being substantially the same as those of the body, and divider means substantially separating the two channels where they enter said opening, the divider providing a restriction in the suction head and defining concave surfaces along each channel with the respective concave surfaces being disposed back to back at said opening to cause the two channels to be of approximately uniform size throughout their length.

5. A vacuum cleaner attachment comprising a suction rectangular parallelepiped, the suction head having a top head shaped approximately in the form of a long and flat and a bottom surface defined by its length and width, a front side and a back side surface defined by its length and height, and two end surfaces defined by its width and height, the top, front side and two end surfaces being closed, the bottom surface having two oppositely extending suction channels which are open throughout their length, the back side surface having an opening located about midway along its length to which the suction channels communicate, a throat surrounding said opening through the back side surface and projecting from the back side surface for coupling the suction head to a vacuum cleaner, the throat having a height and an upper surface which are substantially an extension of those of the suction head, and a divider centrally located with respect to said opening for separating the two channels at their entry into said opening and providing a restriction in the head to restrict the suction-induced flow of air in the portions of the two channels which are adjacent said opening.

6. A vacuum cleaner attachment comprising a suction head shaped approximately in the form of a long and flat rectangular parallelepiped, the suction head having a top and a bottom surface defined by its length and width, a front side and a back side surface defined by its length and height, and two end surfaces defined by its width and height, the top, front side and two end surfaces being closed, the bottom surface having two oppositely extending suction channels which are open throughout their length, the back side surface having an opening located about midway along its length to which the suction channels communicate, a throat surrounding said opening through the back side surface and projecting from the back side surface for coupling the suction head to a vacuum cleaner, the throat having a height and an upper surface which are substantially an extension of those of the suction head, a divider centrally located with respect to said opening for separating the two channels at their entry into said opening, the divider providing a restriction in the suction head and defining concave surfaces along each channel with the respective concave surfaces being disposed back to back at the opening so that the divider restricts the suction-induced flow of air adjacent the opening, and a brush in the form of a row of bristles disposed along the length of the bottom surface near the front side surface.

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