

Nov. 22, 1966

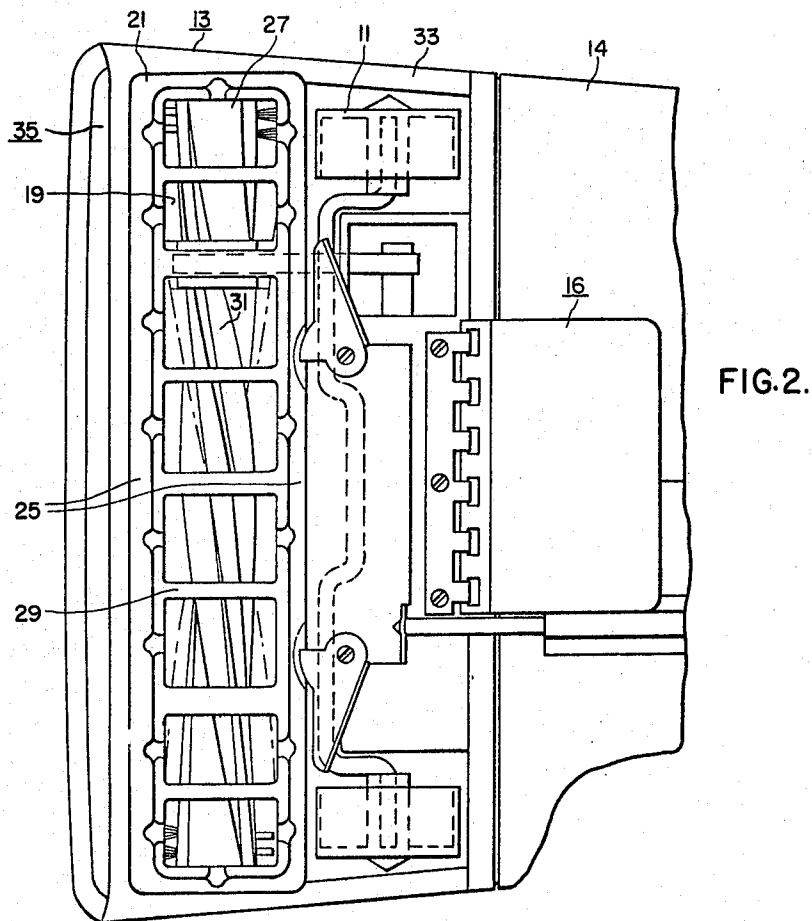
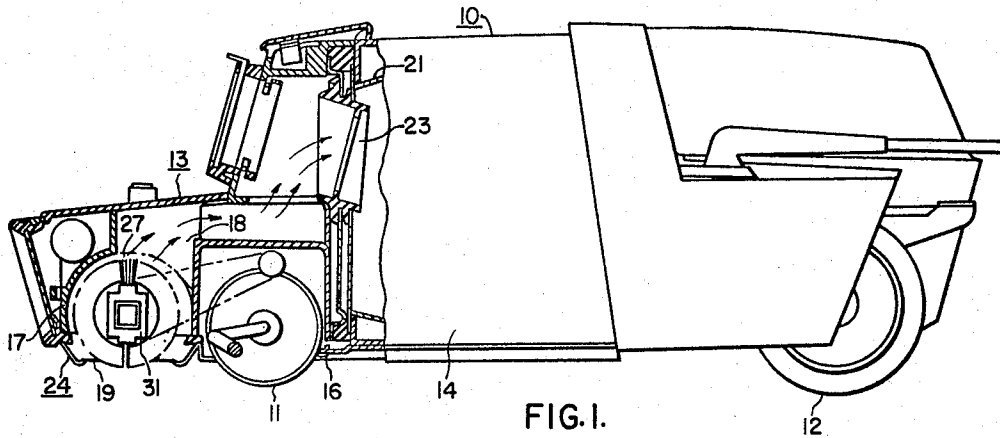
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3,286,296

VACUUM CLEANER

Filed Sept. 8, 1964

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2 Sheets-Sheet 2

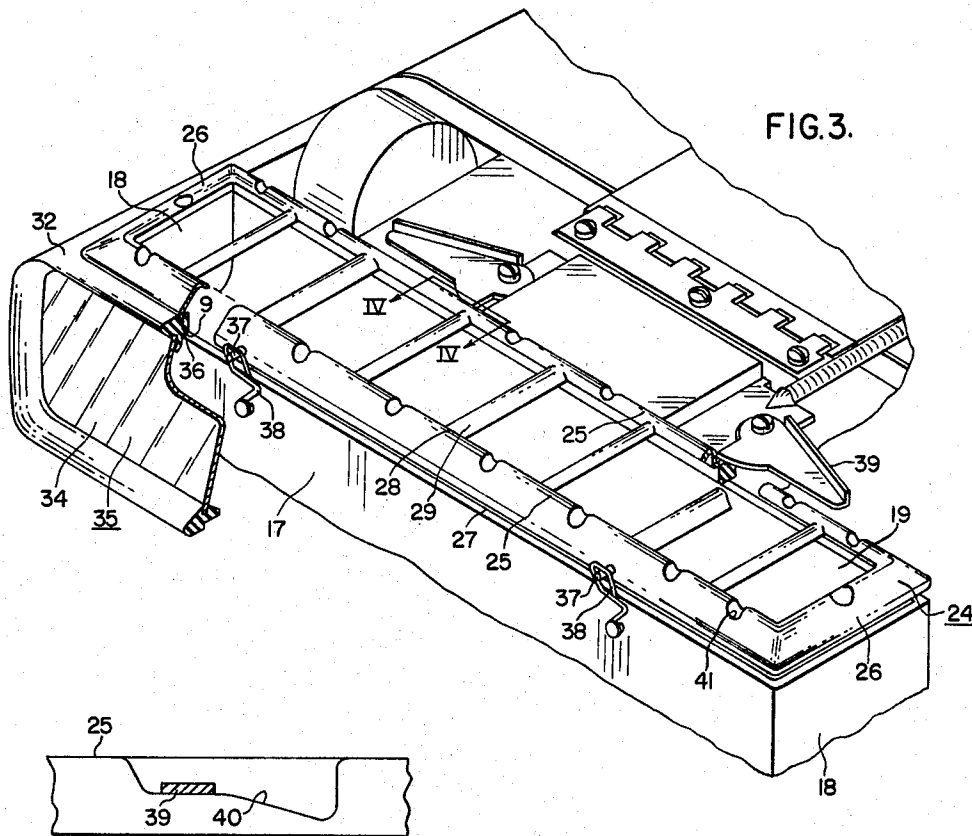


FIG.4.

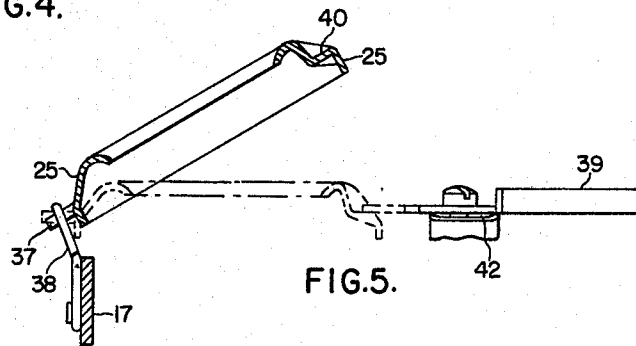


FIG.5.

WITNESSES

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3,286,296

VACUUM CLEANER

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5 Claims. (Cl. 15-422)

This invention relates to upright vacuum cleaners in general and, more particularly, to a rug nozzle guard for vacuum cleaners of this type.

The type of cleaner herein contemplated is so constructed that dirt-laden air passes into a dirt separating container before entering the fan unit of the cleaner. An apparatus of this type may, therefore, utilize a fan designed to draw only clean air, inasmuch as the dirt is filtered out before the air reaches the fan. As is well known to those skilled in the art such a fan is capable of producing a much higher suction than one that is designed to pass dirt-laden air.

Ordinarily, a suction cleaner can be readily moved over the surface to be cleaned because most rugs possess sufficient weight or body to resist excessive arching of the rug into the nozzle which is caused by the high suction produced by the type of fan described above. However, other types of rugs, such as lightweight cotton or throw rugs are drawn into the nozzle, creating resistance to movement, thereby making it more difficult to manually propel the cleaner over the rug as well as impairing proper cleaning.

Various solutions to the above outlined problem have been tried which for the most part have been successful but their success has been lessened by the problems and disadvantages encountered.

For example, some prior art devices have been provided with skeletal attachments for maintaining the inlet to the nozzle at a spaced distance from the surface of the rug for preventing the rug from being drawn into the nozzle. The disadvantage of this type of arrangement is that it eliminates the air seal that normally exists between the nozzle and the rug thereby decreasing the efficiency of the cleaner. Other prior art devices have been provided with attachments which fit into the inlet of the nozzle for reducing the area of suction. Obviously, this is undesirable from the standpoint of suction efficiency. In other words, the attachment creates an additional pressure drop at the inlet of the nozzle which substantially decreases the quantity of air flow therethrough.

Accordingly, it is the general object of this invention to provide a new and improved rug nozzle guard for upright vacuum cleaners.

It is a more particular object of this invention to provide a new and improved rug nozzle guard for upright vacuum cleaners which minimizes the adverse affect of high suction on lightweight or similar rugs, yet provides a leak proof seal between it and the cleaner nozzle.

Another object of this invention is to provide a new and improved rug nozzle guard that can easily be removed and replaced without the use of tools.

Still another object of this invention is to provide a new and improved rug nozzle guard which can be made inexpensively by simple manufacturing methods.

Further objects and advantages of this invention will become apparent as the following description proceeds and features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the invention, reference may be had to the accompanying drawings in which:

FIGURE 1 is a side elevational view of a vacuum cleaner, partly broken away, incorporating one embodiment of the invention;

FIG. 2 is a partial bottom plan view of the vacuum cleaner illustrated in FIG. 1;

FIG. 3 is a fragmentary perspective view, partially in section, of the bottom of the cleaner shown in FIG. 1;

FIG. 4 is a cross-sectional view taken on the line IV-IV of FIG. 3; and

FIG. 5 is a schematic view showing the initial and final position of the nozzle guard with respect to the sealing gasket.

Referring to the drawings, especially FIGS. 1 and 2, reference character 10 designates a vacuum cleaner movably supported by front wheels 11 and rear wheels 12, only one of the rear wheels being shown. The cleaner 10 comprises a nozzle structure 13 pivotally mounted to a dust-container housing 14 by means of a hinge 16 (FIGS. 1 and 2). The nozzle structure 13 is provided with a pair of longitudinal walls 17 and a pair of transverse walls 18 which cooperate to provide a suction inlet 19 (best shown in FIG. 3) which opens through the bottom of the nozzle structure 13 and communicates with a dust-container 21 through a duct 22 (see FIG. 1) and an outlet 23 provided in the nozzle structure.

A nozzle guard 24 (FIGS. 1, 2 and 3), made from any suitable material, for example, metal, is adapted to be mounted at the inlet 19 in a manner to be described below. The nozzle guard comprises parallel longitudinal members 25 which are joined at their extremities by parallel transverse members 26 to form a substantially rectangular box-like structure having continuous top and bottom surfaces 27 and 28 (see FIG. 3), the top surface being coextensive with the free ends of the walls 17 and 18 when the nozzle guard is mounted on the nozzle structure. Attached to the bottom surface 28 in a spaced parallel arrangement are a plurality of cross members 29 which serve to prevent the carpet from being drawn up into the nozzle and at the same time permit maximum contact between a rotating brush 31 (FIGS. 1 and 2) and the carpet being cleaned. The distance between the surfaces 27 and 28 is predetermined such that the cross members 29 are uniformly spaced a distance from the suction inlet 19 in order to minimize clogging of the inlet due to the long soft pile of certain types of carpets and to prevent the carpet from being pulled against the inlet.

A combination sealing gasket and bumper 32, made from any suitable material, for example, vinyl, is secured to the side walls of the nozzle structure 13, as indicated at 33, by any suitable means. The bumper portion extends across the front of the nozzle structure 13 and is provided with a central opening 34 having a peripheral recess for receiving a lens element 35 (best shown in FIG. 3).

The gasket portion of the combination sealing gasket and bumper 32 is fastened to the free ends of the walls 17 and 18 intermediate the suction inlet 19 and the nozzle guard 24 and is provided with a peripheral recess 36 (FIG. 3) for receiving the top surface 27 of the nozzle guard 24. When the nozzle guard is secured in place (FIGS. 2 and 3) the top surface 27 of the nozzle guard engages the sealing gasket within the recess 36 and the free ends of the walls 17 and 18 engage a continuous flange 9 in the sealing gasket (see FIG. 3) to produce an effective air seal thereat, pressure being applied at four points in a manner to be described below.

A pair of pins 37 provided on the forward one of the longitudinal members 25 are adapted to cooperate with a pair of spring hooks 38 provided on the forward one of the walls 17. The spring hooks are vertically positioned with respect to the inlet 19, such that when the pins are initially inserted, the nozzle guard 24 is oriented at an angle with respect to the plane of the inlet 19 (see FIG. 5). As the rear one of the longitudinal members 25 is pushed down against the sealing gasket 32, the spring hooks are extended thereby exerting pressure be-

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tween the forward half of the continuous top surface 27 and the sealing gasket. A pair of cam levers 39 rotatably mounted on the nozzle structure 13 are adapted to cooperate with a pair of cam followers 40 disposed in the rearward one of the longitudinal members 25 of the nozzle guard 24. The cam levers when rotated to their locked positions engage the cam followers 40 thereby applying pressure between the rearward half of the top surface 27 and the sealing gasket 32. A spring washer 42 (FIG. 5) interposed between the cam lever and the nozzle structure serves to bias the cam lever in a well known manner upon actuation thereof of transverse notches 41 which serve to direct air flow through the pile of a rug in a direction parallel to the surface being cleaned rather than through the back of the rug. It will be understood that this arrangement enables the cleaner to be used on rubber-backed rugs with a maximum degree of efficiency since the air cannot be drawn through the back of the rug.

It will be apparent that there has been disclosed a nozzle guard for an upright vacuum cleaner which increases the overall efficiency of operation of the cleaner.

While there has been shown and described what is at present considered to be the preferred embodiment of the invention, modifications thereof will readily occur to those skilled in the art. It is not desired, therefore, that the invention be limited to the specific arrangements shown and described and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In an upright vacuum cleaner having a nozzle structure adapted to move over a surface to be cleaned, in combination, a pair of longitudinal wall members and a pair of transverse wall members cooperating to form a suction inlet, a nozzle guard having a pair of parallel longitudinal frame members and a pair of transverse frame members cooperating to form a substantially box-like structure having a continuous top surface, a sealing gasket interposed between said nozzle and the free ends of said wall members, a pair of pins disposed on one of said longitudinal frame members and projecting outwardly therefrom, extensible spring hooks secured to one of said longitudinal wall members and adapted to receive said pins in such a manner that the plane of said pins and the top surface of the nozzle guard are angulated with respect to the plane of the sealing gasket, at least one rotatable lever secured to the nozzle structure adjacent the other of said longitudinal wall members and adapted to exert pressure on a cam follower provided in the other of said longitudinal frame members while

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simultaneously extending said spring hooks whereby sealing between said wall members and said sealing gasket and between said top surface and said sealing gasket is effected.

2. Structure as specified in claim 1, wherein said sealing gasket is provided with a continuous flange on one surface thereof and a continuous recess on a surface of the gasket opposite said flange, said flange being adapted to abut the free ends of said wall members and said recess to receive said continuous top surface.

3. In an upright vacuum cleaner having a nozzle structure adapted to move over a surface being cleaned, in combination, a pair of longitudinal wall members and a pair of transverse wall members cooperating to form a suction inlet, a nozzle guard having a pair of longitudinal frame members and a pair of transverse frame members, said frame members each comprising a vertical portion and a horizontal portion and cooperating to form a substantially box-like structure having a continuous top surface at the free ends of said vertical portions, a sealing gasket positioned between the free ends of said wall members and said continuous top surface, extensible means including a hook for securing one of said longitudinal members to an adjacent longitudinal frame member to form a hinge between said nozzle guard and said nozzle structure, rotatable means secured to the nozzle structure adjacent the other of said longitudinal wall members and adapted to exert pressure on the other of said longitudinal frame members while simultaneously extending said extensible means, whereby sealing between the free ends of said walls and the sealing gasket and between said top surface and said sealing gasket is effected.

4. Structure as specified in claim 3, including a plurality of cross members secured in a spaced parallel arrangement to the horizontal portions of said longitudinal frame members, said cross members being adapted to minimize arching of a rug into the suction inlet.

5. Structure as specified in claim 3, wherein said horizontal portions of said longitudinal frame members are provided with a plurality of notches for directing air in a direction parallel to the surface being cleaned.

References Cited by the Examiner

UNITED STATES PATENTS

1,328,737	1/1920	Hoover	15—338 X
2,785,431	3/1957	Pardee	15—378 X
2,799,040	7/1957	Hageal	15—420 X
2,851,717	9/1958	Kasper	15—378 X

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