Nov. 29, 1960 C. E. MEYERHOEFER 2,961,689

VACUUM CLEANER NOZZLE

Filed Oct. 25, 1957

FIG. 1

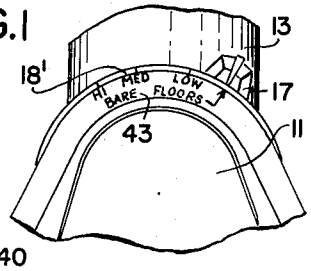


FIG. 2

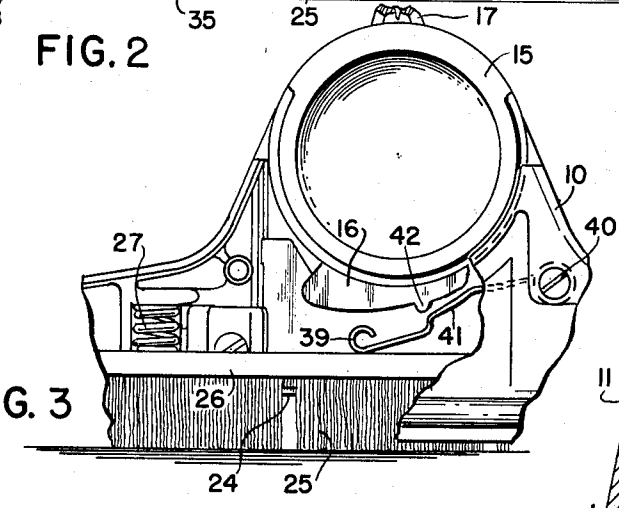


FIG. 3

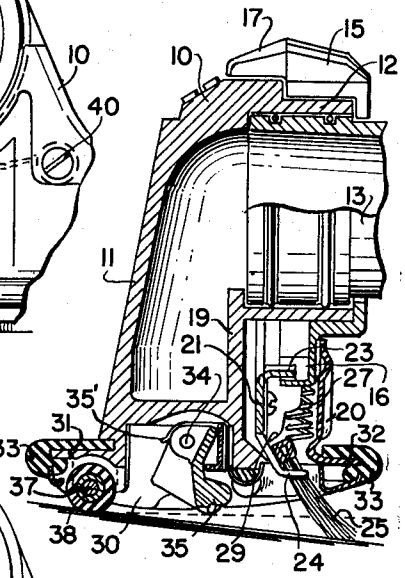


FIG. 5

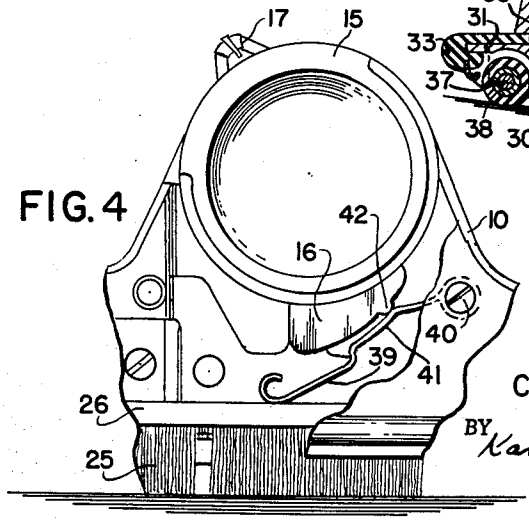


FIG. 4

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VACUUM CLEANER NOZZLE

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1 Claim. (Cl. 15—371)

This invention relates to a structurally and functionally improved vacuum cleaner nozzle; the present application being an improvement of the device of my prior application filed on August 11, 1955, under Serial No. 527,774, now abandoned.

It is a primary object of the invention to furnish an improved unit of this character which may be connected to a suction apparatus so as to effectively clean carpets. Moreover, the nozzle may be traversed over bare floors for the same purpose. When used in the latter connection, it will not mar the finish of the floor by scratching or otherwise injuring the surface of the same.

The parts may be readily adjusted for traversal over desired surfaces such as carpets or bare floors. When so adjusted, the elements of the assembly will automatically assume predetermined and proper positions, so that no conscious effort, which will require skillful correlation of the mechanism, will be necessary on the part of the operator. Once adjusted, the parts will remain in the positions which they have assumed, until further manual adjustment is resorted to.

Among other objects of the invention are those of providing a nozzle assembly which will include relatively few parts, each individually simple and rugged in construction and capable of manufacture at minimum expense; the several parts being readily associated with each other to furnish a unitary apparatus operating over long periods of time with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheets of drawings illustrating practical embodiments of the invention and in which:

Fig. 1 is a fragmentary front view of the upper nozzle portion or housing;

Fig. 2 is a rear elevation of a nozzle assembly of alternative construction with certain of the parts broken away to disclose underlying structure;

Fig. 3 is a fragmentary rear elevation in enlarged scale showing the parts of the nozzle adjusted to one position;

Fig. 4 is a view similar to Fig. 8 but showing those parts adjusted to a different position; and

Fig. 5 is a view similar to Fig. 4 but showing the assembly of the alternative type of nozzle.

In these figures, the numeral 10 indicates the body of a nozzle which will preferably have a centrally enlarged section 11 from which it tapers toward its ends. This body is hollow and is preferably furnished with a rearwardly extending hub or collar 12 lying in the upper zone of the central section and connecting with the interior of the nozzle body. A fitting such as a tube 13 extends into the bore of hub 12. At its inner end this fitting may be formed with annular grooves each receiving bearing and sealing rings 14. These have sliding engagement with the bore surface of hub 12. As will be noted, the inner end of the fitting embraces a diameter greater than the opening furnished at the base of hub portion 12. Therefore inward movement of the fitting is prevented.

Rotatably mounted upon this hub is a ring 15. The

latter is furnished with a tangentially extending portion providing a pocket 16. An indicating extension 17 may also form a part of the ring and lie adjacent indicia 18' associated with the exterior face of the central portion of the nozzle body. The base of the pocket projects radially beyond the outer surface of the ring 15. In the inner face of this base a series of notches may be formed, as shown in the prior patent to Lewyt et al., 2,682,682, of July 6, 1954. These notches will lie at varying distances from the center as defined by the axis of hub 12.

The nozzle body may also include a rear wall 19. Between this and the forward face of the nozzle body, a passage is furnished for the flow of air. The side walls of the nozzle extend beyond rear wall 19 and mount a plate 20 which is spaced from wall 19 to thus provide a compartment. A plate 21 is slidably mounted on the rear face of wall 19 by means of guides 22. This plate has a centrally disposed, rearwardly extending part 23 adjacent its upper edge. It has similarly projecting bracket portions 24 extending from points to each side of its center and adjacent its lower edge. As shown, part 23 may be V-shaped to ride against the inner surface of the wall of pocket 16 and to bear against the surfaces defining the notches formed in that face. Thus, as ring 15 is turned, extension 23 will function as a follower in conjunction with these cam surfaces, and will be raised and lowered to correspondingly shift plate 21.

Within the well or space between wall 19 and plate 20 the backing 26 of a generally flat brush 25 rides. The body of that brush extends downwardly beyond the well. The bracket portions 24 engage the lower edge of the backing 26. Therefore, as plate 21 is raised, the brush will move correspondingly. A pair of springs 27, preferably of a compression type, are arranged within guides 28 having angularly extending edge portions 29. These are preferably integral with wall 19 and extend rearwardly therefrom. The upper ends of the springs bear against roof portions extending between each pair of guide ribs. The lower ends of these springs thrust against the backing 26 of the brush 25 to each side of its center. Therefore these springs urge the brush downwardly. The springs being disposed one to each side of the central section 11 of the nozzle, a somewhat floating support is furnished for the brush which permits the latter to rock so that either one of its ends may elevate above its central portion. Also, when encountering an obstruction or when subjected to undue pressure, the entire brush may retract into the well portion. Additionally, and within limits, the brush may, when partially projected, oscillate around an axis generally defined by its backing strip 26.

A sole plate 30 is suitably secured to the underface of body 10. This plate provides an opening which is aligned with the forward compartment of the nozzle through which air flows to the fitting 13, as well as with the space defined between the wall 19 and the closing plate 20. The area of plate 30 is such that it extends conveniently from a point adjacent the forward edge of flange 31, forming an integral part of body 10, to a point adjacent the rear edge of flange 32, similarly forming a part of the plate 20. A contact strip 33, preferably of rubber, envelops the edges of flanges 31 and 32 as well as the edges of plate 30. This strip serves to prevent marring contact between side wall surfaces, furniture, etc. and the nozzle. Plate 30 may also pivotally support, as at 34, a comb element 35. Springs 35' yieldingly maintain that element in the position shown in Fig. 5. The outer or lower edge of the comb is provided with teeth which on the forward stroke of the nozzle entangle with threads, hair, etc. embedded within or upon the surface of a rug. On the rearward nozzle stroke the

comb element rocks, due to its frictional engagement with the rug surface, to flex springs 35'. As it moves toward the forward wall 11, it will shift these foreign materials to the throat of the nozzle so that the inrushing air may remove the same.

Flange portion 31 has extending from it forked brackets 36. These receive between them shafts 37 which are prevented from being axially displaced by adjacent parts of the forks 36. These shafts mount rollers 38, which are covered with rubber or other suitable material. Further openings are furnished in plate 30 which merely permit of the passage of the peripheral portions of these rollers. In other words, parts of the sole plate underlie the exposed end portions of shafts 37 and prevent the displacement of the latter from the supporting forks 36. Thus, the rollers will remain in association with the underface of flange 31.

In using a nozzle of this type, it will of course be understood that tube or fitting 13 is connected to a wand or directly coupled to a hose attached to a suction apparatus. In view of the fact that the nozzle is intended to be employed in connection with floor surfaces and coverings, a wand will ordinarily be utilized. Assuming that a rug is to be cleaned, then according to the depth of the rug material, the height of the brush 25 will be adjusted. This result will be achieved by rotating ring 15. With such rotation, the cam surface furnished in the inner face of the base of pocket 16 will retract extension 23 to a greater or lesser extent and thus compress springs 27 incident to the lifting action occurring upon the part of the brush by the brackets 24. The nozzle may now be traversed back and forth over the rug. In such traversal, with the brush partially projected, it will be free to rock within limits both in longitudinal and transverse directions.

With the brush in more or less retracted position, rollers 38 may function to a greater or lesser extent. This is immaterial, because the lower surface of plate 30 will act as a sled type of support for the nozzle as the latter is traversed over a carpet. This will be true of a forward movement of the nozzle. A rearward movement of the same will result in the brush rocking around its longitudinal axis.

As will be understood, in the assembly of the parts the rollers 38, the comb element 35 and the brush 25 are disposed in proper position with respect to the body of the nozzle, as are also their associated parts. With the sole plate 30 secured against detachment, the lower face of the nozzle is properly defined and rollers 38 are retained. The follower 23 will be enclosed within the interior of pocket 16 as the ring 15 is passed over the fitting 13. This follower will be constantly urged into engagement with the faces 18, due to the fact that springs 27 bear against backing strip 26 and bracket portions 24 underlie that strip. Those portions forming parts of plate 21, and the latter in turn forming a part of the follower 23, the action of the springs will have this result. It will be observed that fitting 13 is retained in position by the inwardly extending flange portion of ring 15. The latter has its enlarged or extended pocket portion 16 covered by plate 20. Therefore, with that plate secured in position, the parts are retained as an assembly.

A relatively stiff spring 39 is furnished which has a free end bearing against backing strip 26 at a point preferably midway of the latter. This spring has its opposite end mounted for swinging movement by being attached, for example, to one of the screws 40 serving to secure plate 20 in position. The spring 39 is preferably formed with a portion 41 extending toward the base zone of pocket 16. That base carries on its outer face an actuator or projection 42.

In addition to the indicia 18', the face of the nozzle body may carry a legend 43 conveniently reading "Bare Floors." A registry mark is associated with this legend, and the indicator 17 attached to ring 15 may be brought into alignment with this mark. As the ring is rotated through the arc defined within the range of indicia 18', the cam surfaces within the base of pocket 16 will cooperate with the follower so that the parts will function as heretofore traversed. When, however, ring 15 is shifted to an extreme position at which the indicator 17 registers with the proper mark designating the legend 43, then the protuberance 42 extending outwardly from the base face of part 16 will ride against the projecting portion 41 of spring 39. So shifted, this relatively stiff spring will somewhat rigidly bear against the backing strip 26 to maintain at least the central zone of the latter projected. Such maintenance will not prevent that strip and the brush from longitudinal rocking to a limited extent around this zone. This rocking will be resisted by one or the other of the springs 27, which will under normal conditions return the brush to a point where the free ends of its bristles extend parallel to the underface of the nozzle. However, with the shifting of spring 39 incident to being engaged by projection 42, the backing strip 26 will move downwardly and brace against the adjacent edge surfaces of the sole plate. Also, it will brace against the bracket portions 24. Thus, as shown in Fig. 5, the bristles of the brush together with rollers 38 will support the surfaces of the lower face of the nozzle out of contact with the floor. Accordingly, no marring or scratching of the latter will occur as the nozzle is moved thereover.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. It is obvious that numerous changes in construction and rearrangements of the parts may be resorted to without departing from the spirit of the invention as defined by the claim.

I claim:

A vacuum cleaner nozzle assembly including in combination a hollow body having in its lower face an inlet opening and an upwardly located outlet opening for connection with a source of suction to draw air through such inlet opening, said body providing a downwardly extending space adjacent and rearwardly of said inlet opening, a brush disposed within such space and comprising a backing strip and downwardly extending bristles attached thereto, spring means acting against such brush to yieldingly project its bristles into a plane below the lower nozzle face, shiftable adjusting means carried by said body and connected to said brush to limit the amount of its projection while permitting brush retraction against the action of the spring means in response to thrusts against its bristles, a substantially rigid support forming a part of said assembly, a movable member and a cam forming a part of said adjusting means to force said member into contact with a surface of said backing strip, a further and relatively stiff spring providing said member, one end of said spring being movable into contact with said backing strip and said cam comprising a projecting surface of said adjusting means engageable with said spring to thus move the latter through the shifting of said adjusting means to its extreme position.

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