

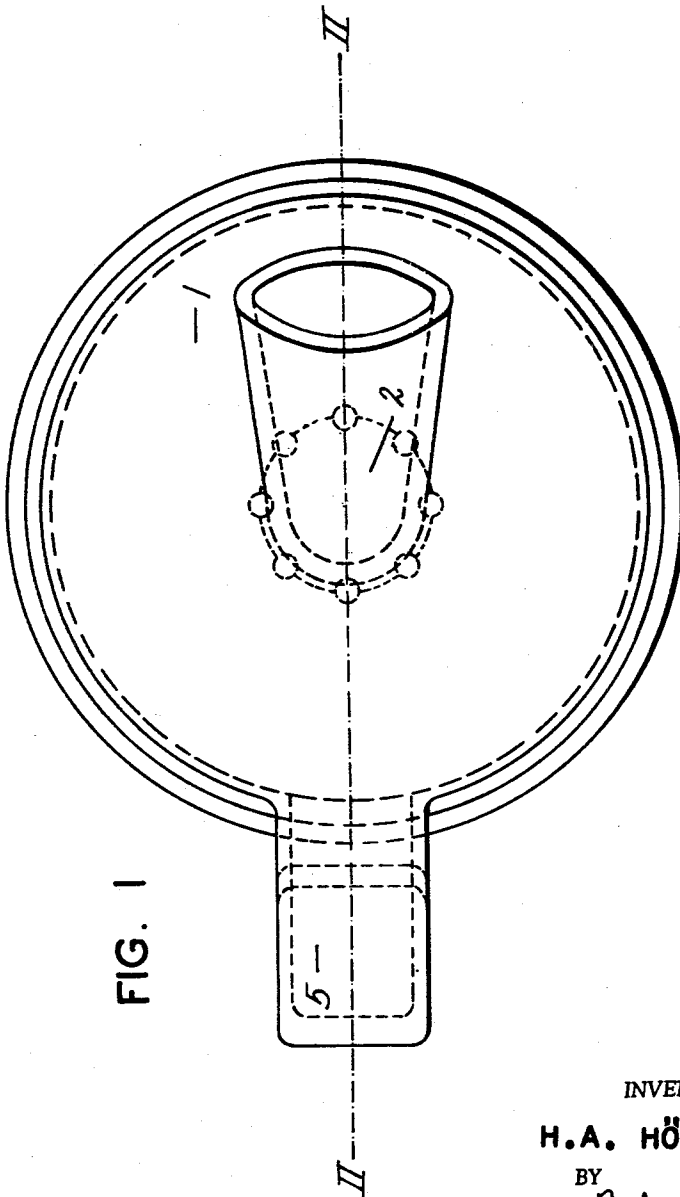
Sept. 22, 1964

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VACUUM CLEANER ATTACHMENT

3,149,363

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2 Sheets-Sheet 1



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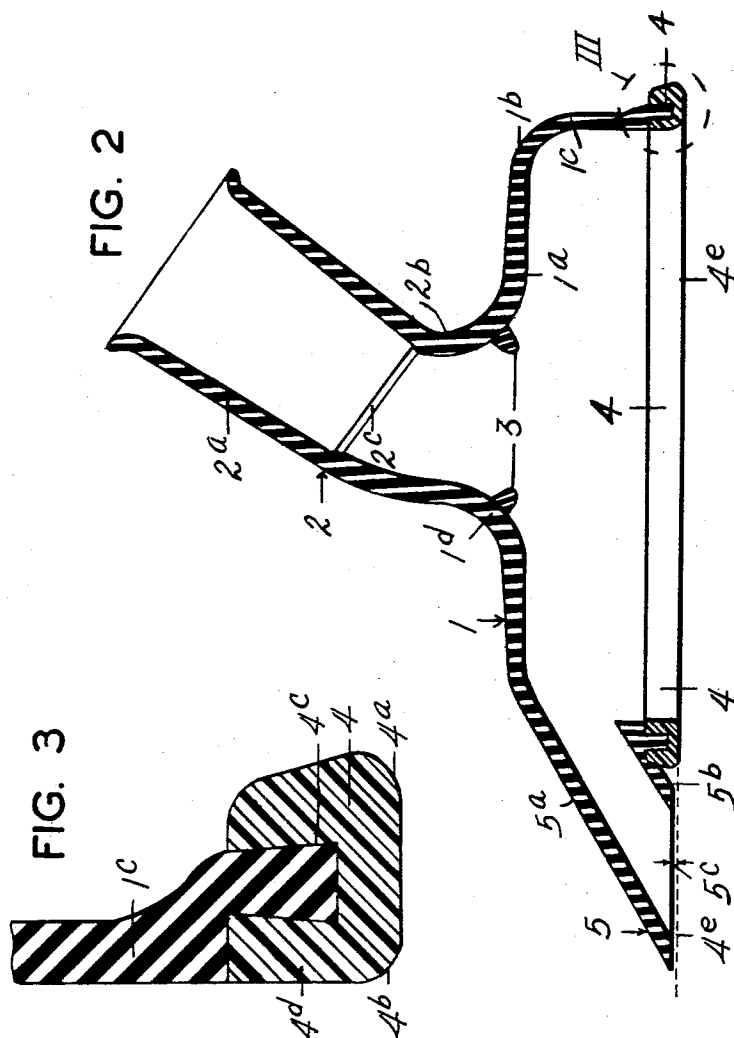
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VACUUM CLEANER ATTACHMENT

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1 Claim. (Cl. 15—373)

This invention relates to a vacuum cleaner attachment and refers more particularly to a vacuum cleaner head of elastic material having the shape of a dome and adapted to be placed over the surface to be cleaned.

In constructing prior art vacuum cleaner heads of this type it was found difficult to guide air sucked into the dome in such manner that it would effectively strike the surface to be cleaned and would cause the whirling movement of dirt and dust which is required for an intensive cleaning operation.

Suggestions have been made to provide the head with a bottom ring having raised portions so that air can be sucked in between the bottom ring and the surface to be cleaned. It was found that such constructions do not provide the desirable strong air jet which will strike the surface to be cleaned.

It was also found that the provision of openings located in the sides of the head will not provide fully effective air jets directed against the surface to be cleaned.

An object of the present invention is to improve prior art constructions.

Other objects of the present invention will become apparent in the course of the following specification.

The present invention is based in part upon the discovery that in the case of vacuum cleaner heads of the described type the effectiveness of an air jet directed against the surface to be cleaned can be greatly increased if the air jet is directed substantially from the top upon the surface to be cleaned essentially opposite to the air flow in the suction tube of the head, while the sliding ring supporting the head maintains the greatest possible air seal.

Therefore, according to the present invention the suction means of the vacuum cleaner head has the purpose of guiding the air sucked in from outside into the head in the form of at least one air jet flowing from above upon the surface to be cleaned, while the rigid supporting ring forms an airtight seal around the surface to be cleaned.

An important advantage of the present invention is the creation of a particularly advantageous joint action of this air jet directed from above upon the surface to be cleaned and of the top cover of the head which is pressed downwardly to a greater or lesser extent. Thus it is possible to regulate to a very great extent the cleaning effect of the vacuum cleaner by the extent of pressure exerted upon the cover of the head. With an increase in pressure upon the cover, the whirling of air within the head is increased, so that it will be possible for the air to take along heavy dirt pieces, such as stones and the like. The depth of penetration of air into a carpet or the like is also increased with more rapid whirling and with the resulting greater speed of flow of the sucked in air. This makes it possible to release pressed down threads and other dirt from a carpet.

According to a preferred embodiment of the present invention the cover of the head is provided with a side nozzle forming the suction means and having a channel extending at an incline to the surface to be cleaned. This suction nozzle also makes it possible to exert a concentrated dust suction effect in corners, along supports, along pieces of furniture, etc. outside of the head cover. The nozzle can operate in that case as an additional suction piece which can receive pieces of dirt which are so large that the head with its sliding ring could not move over them. The air jet produced in the nozzle is projected

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against the cover of the head and will change its direction upon striking the cover, so that it will be partly projected as a wide stream against the surface to be cleaned and in part will form air whirls in the interior of the head.

The suction nozzle also serves as effective protection of furniture and the like against damage to which the furniture may be subjected when struck by the head.

According to another feature of this invention the lower edges of the suction nozzle extend parallel to the bottom plane of the sliding ring and above this plane; this greatly improves the additional suction effect of the nozzle outside of the cover.

It was also found advantageous to provide elastically yieldable projections upon the cover close to the tubular portion of the head, the projections being of such height that they contact the surface to be cleaned only if the cover is pressed down completely.

In prior art vacuum cleaner nozzles threads and hair could be freed and removed from carpets only by means of sharp brush rollers and roughened rubber strips. These rollers and rubber strips always remain in contact with the surface to be cleaned, such as a carpet. As compared to these known constructions, the projections of the present invention, which are located within the head, have the advantage that, as a rule they remain above the surface to be cleaned, such as a carpet, and are operable only when the head cover is completely pressed down, in case there are threads or the like on the carpet which cannot be loosened and removed in any other way by means of the head or the suction nozzle. This avoids excessive wear and tear to which the carpet or other surface to be cleaned is subjected by the continuous action of sharp brushes and rubber strips of the prior art devices.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings showing by way of example only, a preferred embodiment of the inventive idea.

In the drawings:

FIGURE 1 is a plan view of a vacuum cleaner head constructed in accordance with the present invention.

FIGURE 2 is a section along the line II—II of FIGURE 1, and

FIGURE 3 is an enlarged sectional view of a portion of the device indicated by a broken line circle III in FIG. 2.

The vacuum cleaner head shown in the drawings has a casing 1 made of a yieldable plastic material or rubber.

The casing 1 has a top wall 1a which extends substantially horizontally when not under tension, and which is connected by a round portion 1b with substantially vertical side walls 1c.

Substantially in the middle of the top wall 1a there is an annular curved portion 1d which joins a suction tube 2; the suction tube 2 is inclined to the operational surface of the head in a manner known per se. The suction tube 2 is integral with the casing 1 and its upper portion 2a is conical in shape. The lower portion 2b of the tube 2, which is adjacent the curved portion 1d, has a greater thickness than that of the conical upper portion 2a, so that a shoulder 2c is provided within the suction tube 2 at the lower end of the conical portion 2a; the pipe of the vacuum cleaner (not shown) can rest upon this shoulder 2c. The lower portion 2b of the tube 2 and the curved portion 1d are of greater thickness than that of the side wall 1c of the casing 1; thus the top wall 1a has a thickness which decreases from inside outwardly until it becomes as thick as the side walls 1c at the beginning of the round portion 1b.

Resilient projections 3 are arranged in a circle upon the inner surface of the curved portion 1d substantially in the middle of the portion 1d.

An annular ring 4 made of a rigid plastic material is attached to the lower edge of the side walls 1c of the head;

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at least the lower portion of the ring 4 is smooth. The ring 4 extends around the top wall in one plane. The two lower edges 4a and 4b of the ring are rounded, so as to facilitate the sliding of the ring over the surface to be cleaned, particularly carpets.

The ring 4 is attached to the lower edges of the side walls 1c of the casing 1 by means of a groove 4c which is open at the top and which extends outwardly as a dovetail to receive the side walls. The process of attaching the ring to the side walls is carried out by placing the ring 4 provided with the groove 4c into the mold used for the spray casting of the casing 1, whereby the lower ends of the walls 1c are sprayed into the groove during the casting.

During this process, the inner portion 4d of the ring 4 is pressed into the side wall 1c (FIG. 3), so as to provide within the casing 1 a smooth vertical wall surface which does not interfere with air whirls developed within the casing during its use and which will prevent dust and dirt from being deposited within the casing.

The front side of the casing 1, i.e. that side which is in front of the inclined tube 2, is provided with a suction nozzle 5 which is formed directly from the walls 1c. The upper wall 5a of the nozzle 5 is a direct continuation of the top wall 1a of the casing, while the lower wall 5b of the nozzle joins the side wall 1c above the ring 4.

The nozzle 5 extends at such an angle to the plane 4e passing through the lower edge of the ring 4, that the top wall 1a can deflect the air current sucked through the nozzle 5 downwardly upon the surface to be cleaned.

The lower end of the nozzle 5 terminates at a distance 5c above the plane 4e, so as to serve as additional dust suction means and so as to be able to receive large dirt pieces over which the ring 4 can not be conveniently moved.

In operation, the usual procedure is to place the casing 1 over the surface to be cleaned and to press the top wall 1a downwardly to about one half of the height of the side walls 1c, with the result that air penetrating through the suction nozzle 5 finds surfaces which deviate the air jet and form whirls therein. At the same time, the round portion 2 which has been pressed downwardly over the center of the surface enclosed by the ring 4, provides an increased suction action.

This suction action becomes more and more concentrated with the approach of the curved portion 1d to the surface to be cleaned, i.e. with an increase in pressure from above upon the casing 1.

In order to remove particularly firmly attached dirt pieces, the curved position 1d can be pressed downwardly until its projections 3 contact the surface to be cleaned; the projections 3 can loosen the attached dirt particles which will be sucked into the vacuum cleaner by a particularly strongly concentrated suction. As soon as such dirt pieces have been removed, pressure upon the

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round portion 2 is released and the head with its smooth ring 4 can slide over the carpet while sucking in dust, without subjecting the carpet to any wear and tear.

The nozzle 5 has special suction effects in addition to serving as means supplying cleansing air into the interior of the casing and as means capable of absorbing large dirt pieces. Namely, the nozzle 5 can be used to gather dust along edges, pieces of furniture, various supports and legs, and is particularly suitable for cleaning furniture, namely, upholstered furniture, whereby it can be used as a slit nozzle.

It is apparent that the example shown above has been given solely by way of illustration and not by way of limitation and that it is capable of many variations and modifications within the scope of the present invention. All such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

A vacuum cleaner head, comprising a casing consisting of a soft flexible and readily yieldable material and having a substantially horizontal top wall and substantially vertical side walls depending from said top wall and integral therewith, said top wall having a substantially central opening, a suction tube connected with said top wall and surrounding said opening, resilient projections carried by an inner surface of said top wall adjacent said opening, said projections constituting agitating means adapted to engage the surface to be cleaned when said top wall is pressed against the surface, a rigid bottom ring carried by said side walls and having smooth bottom surfaces adapted to form a seal for said casing, said ring defining the perimeter of a portion of the surface to be cleaned, and a suction nozzle connected with said side walls and located to one side of said casing, said suction nozzle enclosing an inclined channel extending from the bottom of said casing toward an inner surface of the top wall so as to discharge air against said inner surface, said suction nozzle terminating in lower surfaces extending above and parallel to the bottom surfaces of said ring.

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