

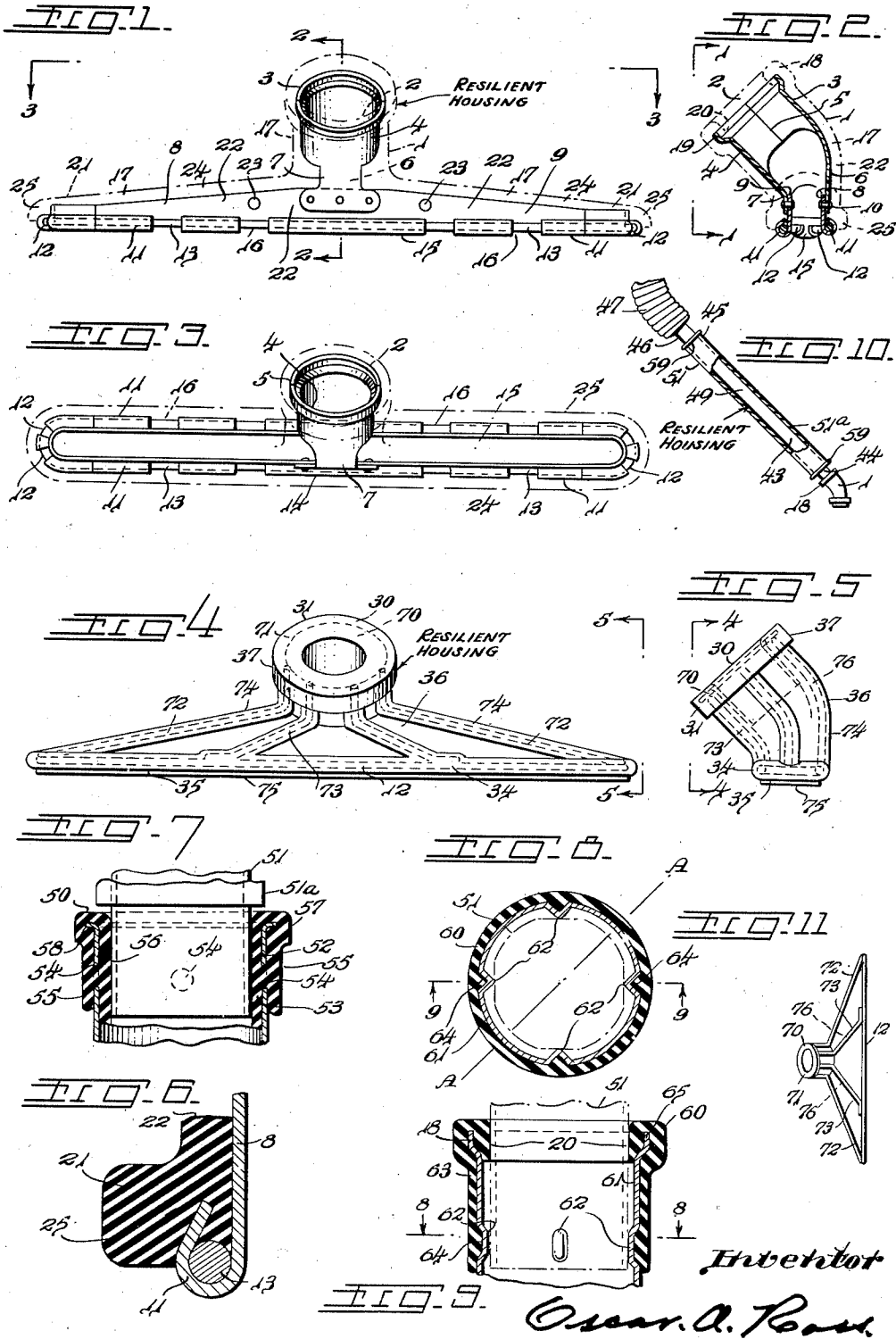
June 17, 1941.

O. A. ROSS

2,246,404

VACUUM CLEANER ATTACHMENT

Filed Oct. 20, 1939



UNITED STATES PATENT OFFICE

2,246,404

VACUUM CLEANER ATTACHMENT

Oscar A. Ross, Los Angeles, Calif.

Application October 20, 1939, Serial No. 300,411

3 Claims. (Cl. 15—155)

This invention relates to vacuum cleaner attachments and more particularly to that form for collecting foreign matter by partial vacuum from surfaces such as floors, rugs, draperies, etc.

This application forms a continuation in part application of my parent application Serial No. 79,802, filed May 14, 1936, now Patent 2,214,725.

Vacuum cleaner attachments for nozzles now generally employed for the cleaning of floors, rugs, draperies, etc., are made of metal or other hard substance and therefore great care must be exercised to prevent the striking thereof against furniture, base-boards, walls or other highly finished surfaces to prevent the marring thereof. This undue care requires the employment of highly skilled operators since carelessness in handling said attachments may seriously blemish said furniture, base-boards, walls or other highly finished surfaces requiring the re-finishing of the same.

This invention comprehends furnishing vacuum cleaner attachments for vacuum cleaning rugs, floors, draperies, etc., which will prevent the marring or blemishing of highly finished surfaces on furniture or other articles should said attachment accidentally come in contact therewith during said cleaning. This is accomplished by pre-forming a frame-like rigid metal structure having suction inlet and outlet openings and thereafter embedding said frame-like structure in a plastic resilient housing forming a suction-like seal between the inlet and outlet openings of said inlet and outlet portions, said housing being formed of a soft, yielding material, thereby preventing the marring of highly finished surfaces when accidentally brought into contact therewith.

The invention further comprehends furnishing a vacuum cleaner attachment as hereinbefore described wherein the suction inlet nozzle portion for engaging surfaces to be cleaned is formed of rigid material for more easily passing over said surfaces. One manner of accomplishing this feature comprises in permitting the rigid, frame-like structure to extend beyond said resilient housing at the suction inlet or nozzle end of the attachment. Another manner of accomplishing this feature comprises in embedding the entire rigid metal frame in said plastic material at the suction inlet or nozzle end of said attachment, the portion of said plastic material housing forming the suction nozzle opening being vulcanized to a rigid hardness for more readily passing over surfaces to be vacuum-cleaned.

This invention also comprehends furnishing

more efficient coupling between male and female coupling portions of vacuum cleaner attachments, more especially with respect to improving the frictional engagement between said attachments and the preventing of one attachment from turning with respect to its correlated attachment.

This invention further comprehends the furnishing of an improved rigid connecting tube between vacuum cleaner attachments and a flexible vacuum cleaner hose, said rigid tube including a flexible and yieldable plastic material covering novelly attached thereto, said covering or housing acting to prevent the marring of highly finished surfaces when accidentally brought into contact therewith during vacuum cleaning, said rigid tube portion having the male end thereof exposed for purposes of coupling but the female end thereof covered by said resilient housing and extending down into the opening therein.

The invention further comprehends furnishing several forms of peculiarly assembled rigid frame-like structures or supports onto which resilient plastic material is molded and in which said supports are embedded.

Other novel features and advantages will be apparent as the description of the invention progresses and the novel and peculiar structure and features thereof will be pointed out herein, and wherein:

The invention consists in the novel construction and arrangement of parts hereinafter described, delineated in the accompanying drawing, and particularly pointed out in that portion of this instrument wherein patentable novelty is claimed for certain distinctive and peculiar features of the device, it being understood that, within the scope of what hereinafter thus is claimed, divers changes in the form, proportions, size and minor details of the structure may be made, without departing from the spirit or sacrificing any of the details of the invention.

In describing the invention in detail, reference is had to the accompanying drawing, wherein I have illustrated a preferred physical embodiment of my invention, and wherein like characters of reference designate corresponding parts throughout the several views, and in which:

Figure 1, is a rear elevational view of one embodiment of the invention taken on line 1—1 of Fig. 2, and Fig. 2 is a sectional view of the same taken on line 2—2 of Fig. 1, and Fig. 3 is a plan view of the same taken on line 3—3 of Fig. 1, and Fig. 4 is a rear elevational view of a modified form of the invention including a modified form of rigid frame or support taken on line 4—4 of

Fig. 5 and Fig. 5 is a side elevational view of the same taken on line 5—5 of Fig. 4, and Fig. 6 is a detailed sectional view showing how the resilient material is interlocked to the fabricated metal frame, and Fig. 7 is a part sectional view of a modified form of attachment coupling portion and Fig. 8 is a sectional view of still another modified coupling portion taken on line 8—8 of Fig. 9, and Fig. 9 is a sectional view of the same taken on line 9—9 of Fig. 8, and Fig. 10 is a side elevational view of a coupled assembly including a cleaning attachment, a rigid hand-piece and a flexible hose, and Fig. 11 is a side elevational view of a modified rigid frame onto which the resilient housing is molded as shown in Figs. 4 and 5.

Referring to Figs. 1, 2, 3 and 6, attachment 1 comprising a suction nozzle unit suitable for the vacuum cleaning of rugs, draperies, etc., comprises a skeleton or frame-like unit or support 2 including the dust outlet or coupling portion 19 formed by the juncture of semi-tubular stampings 3 and 4 welded together at 5, said stampings having extensions 6 and 7 secured to nozzle portion reinforcing plates or stampings 8 and 9 in any suitable manner, as for example, by spot welds 10. The coupling portion 19 receives a conventional extension tube or hand-piece 51 (Fig. 10), or may receive the male coupling portion of other vacuum cleaner attachments as for example a flexible hose. Stampings or plate members 8 and 9, are of similar form and include hinge or embracing portions 11, bent over reinforcing member or slot shaped wire 12, preferably formed of metal rod having exposed portions 13 alternating with said embracing portions 11. Said embracing portions and slotted member form the suction inlet 15 of said attachment, the spaces 16 between said embracing portions forming bleeder inlets to prevent said attachments from becoming locked to a surface being cleaned.

The coupling members 3 and 4 forming the coupling portion 19, connecting portions 6 and 7, nozzle plates 8 and 9 secured to slotted member 12 comprise a pre-fabricated light weight structure or rigid support which is not sealed between the suction inlet and outlet openings of the attachment. For the purpose of forming a seal therebetween, a plastic material resilient cover or housing 17 is molded onto and interlocked with said support against removal, said support being embedded in said resilient housing, said housing may be formed of soft, vulcanized rubber or other suitable plastic material of a yielding nature, said housing comprising a cylindrical outlet or coupling portion 18, the upper or open end of which surrounds the upper end portion or flange of coupling portion 19, providing an annulus having a coupling face 20 arranged to engage the coupling face of a correlated attachment, as for example, hand-piece 51 of Fig. 10. It is to be noted that the cylindrical portion 18 also extends downwardly into the opening of said coupling portion 19. Molded housing 17 further comprises suction nozzle portion 21, joined to said cylindrical portion 17 by an intermediate or flaring housing portion 24. The wall 22 of said flaring or housing portion 24 is interlocked with members 6 and 7 and plates 8 and 9, perforations 23—23 acting to assist in said interlocking. Said nozzle portion 21 includes a bead or buffer portion 25, interlocked with embracing portions 11 and spaces 12 as shown in Fig. 6, said bead portion acting as a buffer in the event attachment accidentally engages furniture or other articles or highly finished surfaces during the use thereof, 75

said bead further acting as a guard for preventing said embracing portion from engaging said furniture, etc.

Referring to Figs. 4, 5 and 11 showing a modified form of vacuum cleaner 30, including a modified form of rigid support or frame 70. Said frame comprises slotted member or metal loop 12 formed of rigid material preferably metal rod or wire, see Fig. 11 to which one end of rigid reinforcing or connecting members 72, 73 and 76 are secured preferably by welding, said members likewise being preferably formed of metal rod or wire, the other end of said connecting members being secured to suction outlet coupling member 71, preferably by welding, said coupling member comprising a cylindrical portion and a flanged portion. Said rigid frame or support 70 is pre-formed and thereafter embedded in plastic resilient housing or covering 31, said housing or covering being molded onto said support and interlocked therewith. Resilient housing 31 comprises intermediate or flaring portion 36 molded onto connecting members 72, 73 and 76, coupling portion 37 molded onto said coupling members 71, and nozzle portion 34 molded onto slotted member 12, said last-named member being completely surrounded by said nozzle portion 34. In molding said resilient housing 31 onto said rigid support 70, the portion of said housing extending from the suction nozzle inlet to the suction outlet thereof is made of yieldable material, whereas the rubbing face portion 35, which engages a surface to be cleaned is preferably made of a rigid molded material. This may be accomplished by forming the housing 35 of rubber and vulcanizing the rubbing face portion 35 to a rigid hardness whereas the remainder of said housing is vulcanized to a yieldable hardness. If desired the surface engaging or rubbing face portion 35 may also be formed of resilient plastic material. The coupling portion 37 of resilient housing 35 preferably extends downwardly inwardly of the suction outlet opening for receiving the male end of a correlated tubular attachment as more fully shown in Figs. 7, 8, 9 and 10. The nozzle portion 34 is provided with a slot-shaped opening forming the suction inlet of said attachment.

Referring to Fig. 7 showing a modified form of outlet coupling portion 50 which may be employed on any one of the vacuum cleaner attachments 1 or 30 or at the upper end of hand-piece 51, said coupling portion comprises metal sleeve portion 52 having a diameter greater than the diameter of the male portion of the correlated attachments inserted therein whereby the cylindrical portion 53 formed integrally with the outer cylindrical or sleeve portion 55 will act as the coupling opening independently of engagement of sleeve portion 52. Said sleeve portion 52 is formed with apertures or orifices 54 through which said resilient material extends for joining sleeve portions 52 and 55 and also for interlocking said sleeve portions to rigid sleeve portion 52. Flange portion 58 formed on sleeve portion 52 also acts to prevent relative axial movements of resilient sleeve portions 53 and 55 with respect to rigid sleeve portions 52, said flange portion being interlocked and embedded in bead portion 57 forming the juncture between sleeve portions 53 and 55.

Referring to Figs. 8 and 9 showing a modified form of outlet coupling portion 60, said portion is similar to coupling portion 19 of attachment 1. However, rigid sleeve portion 61 is of a larger diameter than the diameter of sleeve portion 3—4

whereby a space is formed therebetween and the male coupling portion of a correlated attachment inserted thereinto. Inwardly projecting bosses 62—62 are formed on sleeve portion 61 and extend inwardly a sufficient distance to slightly deform said male portion as it is inserted therebetween, said bosses tending to form said male coupling portion to a rectangular form whereby it will not readily turn or twist with respect to coupling portion 60. Since the rigid metal tube of hand-piece 51 has a comparatively thin wall, a slight deflection thereof may be made without permanently deforming the same, said male portion assuming its normal cylindrical form after being withdrawn from contact with said bosses 62. One of the difficulties experienced during use of vacuum cleaner attachments has been the loosening of the nozzle unit as one or 30 from the hand-piece as 51, owing to a turning movement therebetween at the point of coupling, especially when the nozzle unit comes into contact with furniture or other articles during the cleaning operation. This difficulty is overcome by slightly deforming the male coupling portions of the hand-piece as 51 as it is inserted into engagement with the bosses 62—62, thereby preventing possibility of a turning movement relatively therebetween. The molded resilient sleeve portion 63 is locked against rotation by being molded into depressions or detents 64 produced when forming bosses 62 and is also locked against actual movement by enlarged annular portion 65 of rigid sleeve portion 61. It will also be noted that the portion of head 18 extending downwardly into enlarged annular portion 65 has an opening of lesser diameter than the diameter of rigid sleeve portion 61, said opening acting to form the air seal between coupling portions 60 and the male coupling portion of a correlated attachment as 51.

Referring to Fig. 10 showing an improved form of hand-piece or rigid tube attachment 51 to which vacuum cleaner units as 1 or 30 may be attached. Said unit comprises a rigid metal tube 43 having a male portion 44 which is slightly tapered at the lower end thereof, said tapered or conical portion being inserted into the coupling portion as 19 of unit 1, the other end of said member having a female coupling portion 45 which coupling portion may be similar in form to that shown in Fig. 7 or Figs. 8 and 9, or may be of the form shown in Figs. 1, 2 and 3 and into which may be inserted the male coupling end 46 of the flexible tubular member or hose 47. The intermediate portion 49 of rigid tubular member 43 is covered by the resilient housing or tubular member 51a, having a bead 59 at each end thereof. When the coupling portion shown in Fig. 7 is employed the resilient housing 51a forms a substantial continuation of cylindrical sleeve portion 55 and when the form of coupling shown in Figs. 8 and 9 is employed, said resilient housing forms a substantial continuation of the resilient sleeve portion 63. Rigid tubular member 43 is of cylindrical form and is preferably made of metal. After units 51 and attachments as 1 or 30 are coupled together the space between lower bead 59 on hand-piece 51 and bead 18 of nozzle unit 1 is comparatively small and insufficient to permit ordinary protrusions of the furniture or other room articles from entering therebetween as said

coupled units are moved under chairs, dressers, beds or the like.

If desired the extension tube or hand-piece 51 may have male portions as 44 at each end thereof, or said hand-piece may have female coupling portions as 45 at both ends thereof.

It will be noted that by forming the light weight supports or frames as 2 or 70 in the manner shown, weight reducing openings are produced between the connecting or reinforcing members or portions 6, 7, 8, 9, of support 1 and similar members or portions 72, 73 and 76 of support 70, which openings are air sealed when said plastic material resilient housing or cover is molded thereonto.

It is also to be noted that said connecting or reinforcing members or portions, as 6, 7, 8, 9 of support 1, and similar members or portions 72, 73 and 76 of support 70, plastic housing molded thereonto will form an air tight suction chamber between the suction outlet and inlet openings of the improved attachments as 1 and 30.

What I claim is:

1. In a vacuum cleaner attachment, a rigid skeleton support comprising an orificed coupling member adapted to receive a correlated attachment, an orificed suction nozzle member and a plurality of rod-like connecting members arranged in skeleton-like chamber forming relation rigidly connecting said coupling and nozzle members in spaced relation, and a plastic material resilient housing in which said support is embedded extending between said coupling and nozzle member orifices and surrounding said connecting members for forming a suction type chamber between said orifices.

2. In a vacuum cleaner attachment, a rigid skeleton support comprising, a rigid coupling portion having a suction outlet opening adapted to receive a correlated attachment, a rigid suction inlet nozzle portion having a suction inlet opening, and a plurality of rigid portions arranged in skeleton-like suction chamber forming relation rigidly connecting said coupling and nozzle portions in spaced relation, and a plastic material resilient housing in which said support is embedded having one portion extending continuously between said coupling and nozzle support portions for forming a suction tight chamber therebetween and another portion extending beyond said support nozzle portion for engaging a surface to be cleaned, said last named portion having a resiliency less than the resiliency of said first named housing portion.

3. In a vacuum cleaner attachment, a rigid skeleton support comprising, a rigid suction outlet coupling member having a suction outlet opening for attachment to a correlated attachment, a rigid suction inlet nozzle member having a suction inlet opening, and a plurality of rigid skeleton members rigidly connecting said coupling and nozzle members in skeleton-like spaced relation, and a plastic material resilient housing in which said support is embedded extending over said support continuously between said coupling and nozzle members, said resilient housing including a nozzle portion completely surrounding said nozzle member and having a surface engaging face for engagement with a surface to be cleaned.

OSCAR A. ROSS.