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VACUUM CLEANER

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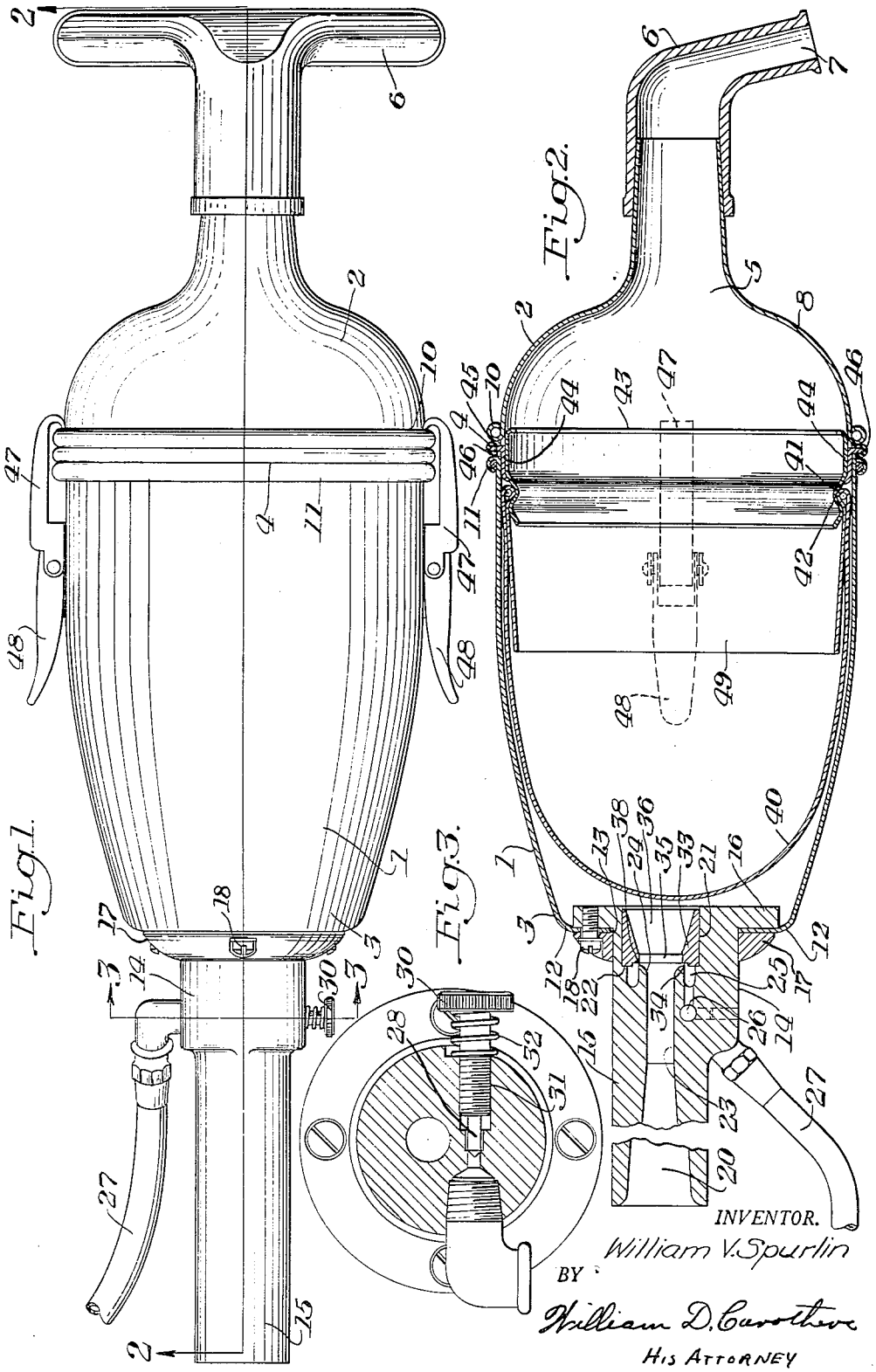

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VACUUM CLEANER

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This invention relates generally to vacuum cleaners and more particularly to a vacuum cleaner operated by compressed air.

The principal object of this invention is the provision of a simplified vacuum cleaner that is provided with an improved ejector nozzle for connection with air under pressure for the purpose of inducing an improved suction and flow through the vacuum cleaner. A vacuum cleaner operated by an ejector nozzle from air under pressure has considerable utility in garages, filling stations and other shops where automobiles are serviced and cleaned, which shops ordinarily have compressed air. The vacuum cleaner operated by compressed air is materially lighter and more readily manipulated than other types of vacuum cleaners.

Another object is the provision of a simpler and more economical ejector nozzle for a vacuum cleaner.

Another object of this invention is the provision of a novel casing making up the vacuum sweeper comprising this invention.

Other objects and advantages appear hereinafter as set out in the following description and claims.

The accompanying drawings show, for the purpose of exemplification without limiting the invention or claims thereto, certain practical embodiments of the invention wherein:

Fig. 1 is a top plan view of the vacuum cleaner comprising this invention.

Fig. 2 is a vertical section taken along the line 2—2 of Fig. 1.

Fig. 3 is a vertical section taken along the line 3—3 of Fig. 1.

Referring to the drawings the vacuum cleaner is made up of the two-part casing 1 which has an inlet part member 2 and a discharge part member 3. These casing parts are constructed so as to be joined together at 4. The inlet casing is a cap member and has a small diameter neck 5 on which is attached the hollow suction nozzle 6 which has the mouth 7 in which the dust and dirt are drawn through the throat of the neck 5 and into the cap or head portion 8. The rim of the cap of the inlet casing section 2 has a bead or flange 10 turned thereon which extends in a circular path defining the rim of the casing section 2.

The casing section 3 likewise has an annular bead or flange 11 formed thereon. The casing is cylindrical and extends rearwardly where it is provided with an inturned flange 12 having a relatively large diameter opening 13.

The opening 13 is sufficiently large to receive the butt end 14 of the ejector nozzle 15. The butt end of the ejector nozzle is provided with an annular radial flange 16 that backs up and engages the inner face of the flange 12. A clamping ring 17 encircles the butt end 14 of the ejector nozzle and is provided with a plurality of holes to receive the bolts 18 which are threadably engaged in aligned holes in the flange 16 for the purpose of clamping the nozzle 15 on the outlet casing section 3.

The ejector nozzle 15 comprises a body, the bore 20 of which extends from one end of the nozzle to the other and is made up of different cross-sectional sections. A large bore 21 of uniform diameter is shown at the butt end of the nozzle 15 which terminates at the shoulder indicated at 22. The intermediate bore 23 is a small compression bore and has a uniform cross section. An annular arcuate surface 24 connects the radial shoulder 22 with the small compression bore 23, thus providing a uniform and continuous connection between the shoulder and the bore 23. The other end of the intermediate bore 23 connects with the outwardly flaring bore section 20.

The shoulder 22 has an annular trough 25 cut therein, which trough is connected by the passageway 26 to a source of supply of air under pressure as indicated by the hose line 27. The passageway 26 is controlled by the valve 28 as shown in Fig. 3 which has a thumb screw adjusting handle 30 and is threadably engaged in the passage as indicated at 31. The valve is provided with a helical spring 32 for maintaining pressure on the threads. The valve may be adjusted under the pressure of the spring to control the amount of air under pressure admitted to the annular well 25.

The bore section 21 is constructed to receive the ring member 33 which has a uniform exterior diameter to provide a press fit in the bore 21. The inner end of the ring member 23 is cut away, as indicated at 34, for the purpose of forming a thin radial slot with a portion of the arcuate surface 24. However, the cutaway portion 34 is radial to the axis of the nozzle whereas the arcuate surface is constantly changing. The bore of the ring 33 has a uniform diameter, as indicated at 35, adjacent its inner end and a tapered bore section 36, being larger at the outer end of the ring and becoming progressively smaller to the short bore section 35. The bore section 35 is slightly smaller in diameter than the inside small diameter of the well 25, thus it overlaps slightly on the arcuate surface 24 to form the radial slot 38.

The air under pressure flows through the hose 27 and past the valve 28 and through the passageway 26 to the annular well 25. This air then flows radially outwardly towards the axis of the nozzle, however the arcuate surface 24 causes the air under pressure to flow around its surface rather than to continue in a radial path. The air under pressure that flows around the arcuate surface 24 into the intermediate bore 23 compresses the air that is in this bore owing to the fact that the bore 23 is of uniform diameter from one end to the other. This compression bore section induces a partial vacuum in the bore 35 of the ring 33 and in the tapered bore 36, thus inducing a flow of air from the chamber within the casing 12. The air under compression then expands in the bore section 20 to the discharge nozzle to increase the flow, thus the well 25 and the annular radial slot 38 form an ejector to induce a suction in the nozzle 7.

The air and dust travel through the nozzle 7 and into the dust bag 40. This bag is provided with an annular flexible ring 41 at its mouth, which ring is disposed under tension in the annular groove 42 of the intermediate housing section 43. This section is in the form of a band having the annular depression 43 and having secured thereto the hoop 44 which is provided with the outwardly projecting flange 45. A U-shaped rubber gasket 46 is placed over the annular flange 45 for the purpose of providing a seal against which the annular beads 10 and 11 of the housing sections 8 to 12 may be pressed in sealing engagement.

Pressure is exerted on the beads 10 and 11 of the housing sections 2 and 3 by means of the tines 47 of the clamps 48 attached to the section 3 of the casing. Two such clamps are provided on diagonally opposite sides of the casing and are provided with an over center locking ar-

rangement for the purpose of tightly clamping the beads **10** and **11** against the annular elastomer sealing member **46**.

The bag **40** extends up around the flexible member **41** and is provided with a depending skirt **49** which extends back beyond the intermediate casing member **43** and aids in maintaining the dust within the bag **40**. When it is desired to clean the bag the clamps **48** may be unlatched and the housing is then separated permitting the withdrawal of the intermediate casing **43** and the dirt may be shaken from the bag when turned inside out. Again the bag may be removed from the ring member **43** and another bag replaced thereon without much difficulty.

The casing of this vacuum cleaner is simple in construction and provides a very light and compact cleaner which is readily manipulated. The inlet casing **2** may be turned at any position to direct the nozzle in any way relative to the ejector nozzle and the hose **27**. The ejector nozzle **15** functions as a handle for manipulating the cleaner. The simplicity of this structure provides an inventive novelty not heretofore disclosed in other structures and the simplicity of the several parts provide an improved device which functions to operate and produce an improved result.

While, for clarity of explanation, certain preferred embodiments of this invention have been shown and described, it is to be understood that this invention is capable of different modifications, and changes in the construction and arrangement may be made therein and certain parts may be employed with conjoint use of other parts and without departing from the spirit and scope of this invention.

I claim:

1. A compressed air vacuum sweeper comprising a two

part casing forming a chamber and having matched cooperative ends, one casing part having a suction nozzle opening into said chamber, the other casing part having a handle with a compressed air suction inducing means and an air discharge passage from said chamber, a shoulder on the matched ends of each casing part, an intermediate housing section in the form of a sleeve fitting into the matched ends of each casing part and carrying in said chamber a dirt bag extended toward the air discharge passage, an annular elastomer sealing member on said sleeve to seal between the shoulders of the casing parts when fitted on said sleeve, and releasable clamping means on said casing to hold said shoulders against said sealing members.

2. The structure of claim 1, which also includes an annular flexible ring at the mouth of said dirt bag, and an annular groove in said sleeve to receive said annular flexible ring when stretched over the end of said sleeve.

3. The structure of claim 2 characterized in that said sleeve fits into said other casing part to cover said annular groove and lock the flexible ring of the dust bag in said groove.

References Cited in the file of this patent

UNITED STATES PATENTS

1,172,450	Griffin	Feb. 22, 1916
1,715,861	Owen	June 4, 1929
2,073,489	Leathers	Mar. 9, 1937
2,340,944	Easter	Feb. 8, 1944
2,346,339	Vose	Apr. 11, 1944
2,360,155	Nuffer	Oct. 10, 1944
2,475,832	Gilliland	July 12, 1949