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VALVED CLEANING TOOL FOR SUCTION CLEANERS

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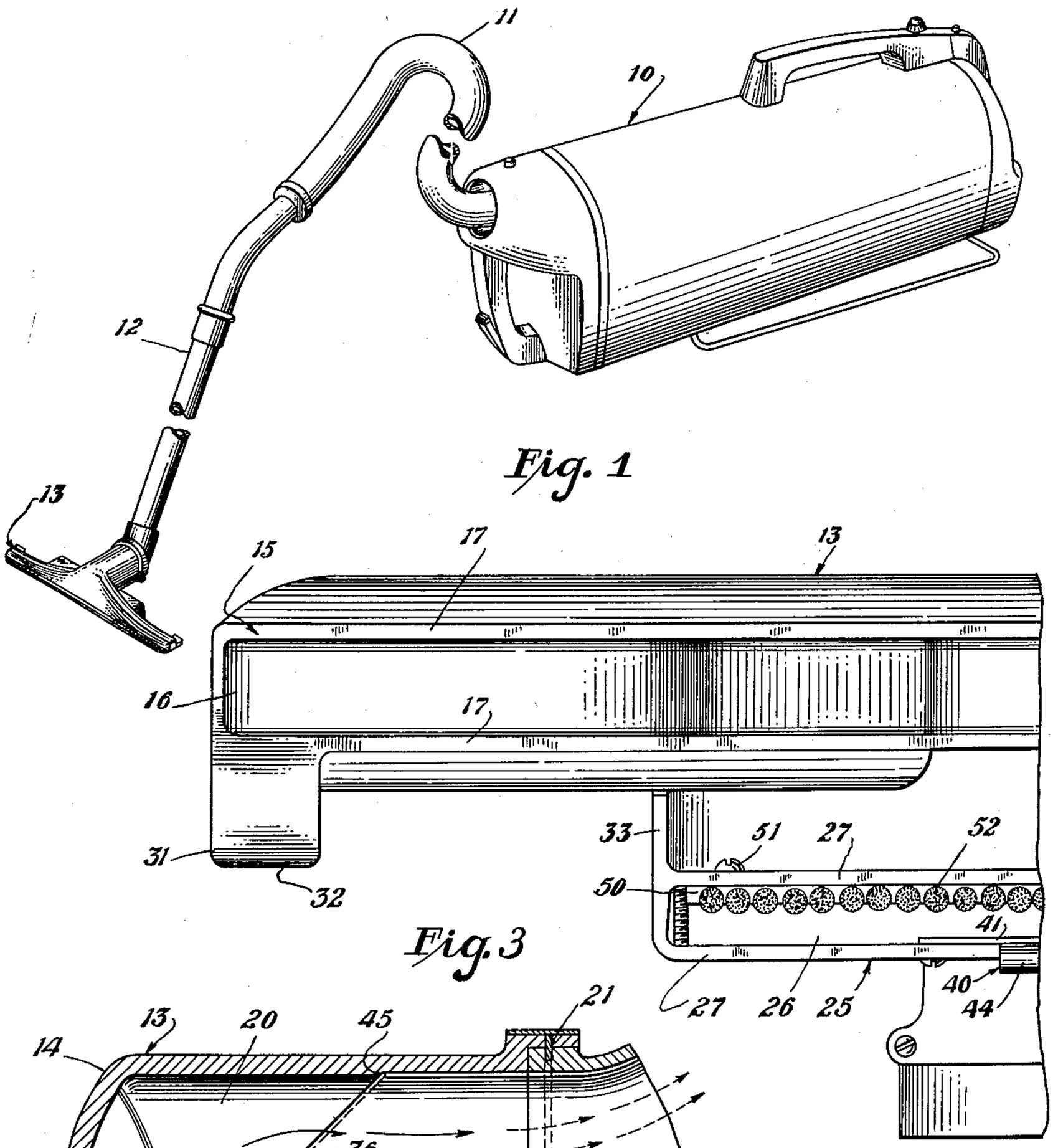

Fig. 1

Fig. 3

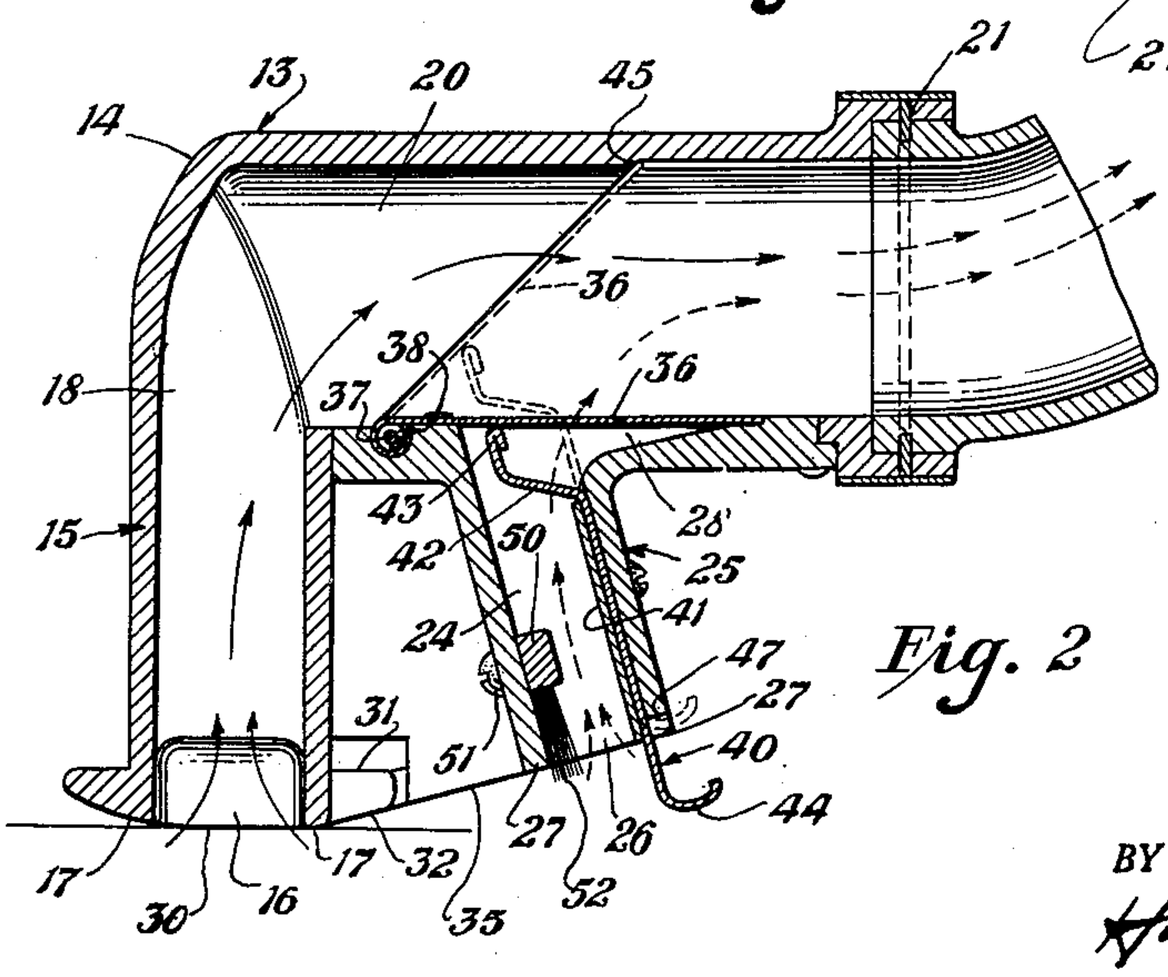

Fig. 2

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VALVED CLEANING TOOL FOR SUCTION CLEANERS

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4 Claims. (Cl. 15—417)

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The present invention relates to suction cleaners and more particularly to a surface cleaning tool for use with suction cleaning apparatus.

An object of the invention is to provide a cleaning tool having a large and small nozzle each of which are selectively operable for surface cleaning. Another object is to provide a cleaning tool having a pair of nozzles arranged in different planes and selectively operable by turning the tool on the surface being cleaned. A further object is to provide a cleaning tool having valve means operative by engagement with the surface being cleaned to connect a nozzle with a source of suction. Other objects and advantages of the invention will be apparent from the following description and drawings, wherein:

Figure 1 is a perspective view of the cleaning tool and a suction cleaner;

Figure 2 is a sectional view of the cleaning tool, and

Figure 3 is a partial bottom plan view of the tool.

The embodiment of the invention herein disclosed comprises a suction cleaning apparatus of the cylinder type having a casing 10 in which is disposed an unshown source of suction and a filter, and extending from the casing 10 is a flexible hose 11 attached to a rigid wand 12 connected to the cleaning tool 13.

The cleaning tool 13 includes a body 14 provided with an elongated rectangular front nozzle 15 having its mouth 16 defined at its surface contacting perimeter by a nozzle lip 17, and the mouth 16 communicates with a vertical passageway 18 which at its upper end connects with a passageway 20 disposed centrally in the upper portion of the body 14. Arranged at the end of the passageway 20 is a swivel joint 21 for connection to the wand 12.

Below the passageway 20 and rearwardly of the front nozzle 15 is another nozzle 25 having its mouth 26 defined by a surface contacting lip 27, and the mouth communicates with a passageway 24 and through an enlarged opening 28 to the passageway 20. The nozzle 25 is disposed centrally of the cleaning tool and is of less extent and cross-section than the nozzle 15.

The front nozzle mouth 16 is arranged in a plane indicated by the line 30, and projecting rearwardly from the opposite ends of the nozzle mouth 16 are shoes 31—31, each provided with an upwardly extending bearing surface 32 for engagement with the surface to be cleaned. Cooperating with the bearing surfaces 32—32 is the rear nozzle lip 27 and forwardly projecting

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walls 33—33 to provide a bearing surface indicated by the line 35 which is in a plane disposed at an angle to the plane 30 of the front nozzle mouth, whereby upon turning the nozzle body upwardly or downwardly on the surface being cleaned either one of the nozzle mouths 16 or 26 can be selectively engaged with the surface to be cleaned.

A valve 36 is pivotally mounted on a pin 37 and is biased by a torsion spring 38 to the full line position shown in Figure 2 to close the opening 28 and thus the small nozzle 25 to the passageway 20 and the source of suction. In order to operate the valve 36 a member 40 is slidably mounted between the rear wall of the small nozzle 25 and a plate 41 attached thereto. The operating member 40 is provided at its upper end with an off-set portion 42 the end 43 of which engages the valve 36, and the opposite end of the member 40 has a curved portion 44 for engagement with the surface being cleaned. Upward movement of the member 40 is limited by the valve 36 abutting a shoulder 45 in the passageway 20 and also by the arcuate portion 44 abutting the upper wall of a recess 47, as indicated in dotted lines in Figure 2.

Disposed within the small nozzle 25 is a brush having its back 50 secured by screws 51 to the front wall of the small nozzle, and its bristles 52 project downwardly beyond the nozzle lip 27 for engagement with the surface being cleaned when the small nozzle mouth 26 is in use.

In operation, the passageway 20 of the cleaning tool is connected through the wand 12 and flexible hose 11 to the source of suction in the casing 10. If it is desired to perform normal surface cleaning the wand 12 is manipulated to an angular position to cause the large nozzle mouth 16 to engage the surface being cleaned and the valve 36 is in the full line position shown in Figure 2 to connect the large nozzle to the source of suction. The large nozzle mouth 16 provides for passage of a relatively large volume and low velocity air stream in comparison to the small nozzle mouth 26, and thus is employed to remove dirt not embedded in the surface being cleaned.

If the dirt, threads or other litter can not be removed by the large nozzle 15 then the smaller nozzle is employed and it is moved into engagement with the surface being cleaned by tilting the wand 12 downwardly, causing the nozzle body 14 to be rotated on the surface, raising the large nozzle mouth 16 therefrom and moving the small nozzle mouth 26 into engagement with the surface. Movement of the small nozzle mouth 26 into engagement with

the surface causes the arcuate member **44** to also abut the surface and upon continued downward tilting of the nozzle body the valve operating member **44** slides upwardly to move the valve **36** from its full line to dotted line position shown in Figure 2. In the dotted line position of the valve **36** the large nozzle **15** is cut off and the small nozzle **25** connected to the source of suction. In this position of the small nozzle the air passes with greater velocity over the surface being cleaned and functions to remove the litter clinging to the surface. The brush **52** loosens the litter on the surface being cleaned and the air stream carries the litter through the small nozzle to the cleaner **10** where the filter removes the dirt from the air stream.

In order to thereafter employ the large nozzle **15** the operator raises the wand **12** and rotates the nozzle body **14** upon the surface being cleaned, whereupon the torsion spring **38** moves the valve **36** and member **40** to the full line position in Figure 2, to thereby connect the large nozzle mouth **16** with the source of suction and also disconnect therefrom the small nozzle mouth **26**. During movement of the nozzle body to its different nozzle positions the body is rotated on the bearing surfaces indicated by the lines **30** and **35**.

While I have illustrated and described the invention in considerable detail, it is to be understood that various changes may be made in the arrangement, proportion and construction of parts without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A surface cleaning tool comprising a body, a first and second nozzle in said body, a tubular wand mounted on said body connecting said nozzles to a source of suction, said nozzles being arranged in different planes disposed at an angle to each other and movable into operative position with the surface to be cleaned, valve means mounted on said body independently of said wand for selectively connecting said nozzles to the source of suction when said nozzles are in their respective operative positions, and valve operating means engageable with the surface being cleaned and responsive to such engagement upon movement of one of said nozzles into its operative position on the surface to be cleaned to shift said valve means and control communication of said nozzles with the source of suction.

2. A surface cleaning tool comprising a body, a first and second nozzle in said body, a passageway connecting said nozzles to a source of suction, said body having bearing surfaces arranged at an angle to each other for selective engagement with the surface being cleaned upon rotation of said body upon the surface, each of said nozzles being so arranged with respect to a bearing surface so as to be in operative position with the surface being cleaned upon movement of

said related bearing surface into engagement with the surface being cleaned, valve means for selectively connecting said nozzles to the source of suction, and means engageable with said surface and responsive to said engagement upon movement of one of said bearing surfaces into engagement with the surface being cleaned to move said valve means and connect the nozzle associated with said one bearing surface with the source of suction.

3. A surface cleaning tool comprising a body, means forming a first nozzle in said body, means forming a second nozzle in said body, said nozzles being arranged in different planes disposed at an angle to each other and movable into operative position with the surface to be cleaned, a tubular wand connected to a source of suction and to said nozzles and operable to tilt said nozzle body while engaged with the surface being cleaned into said different planes for selectively arranging said nozzles in said operative positions with said surface for cleaning the same, valve means for selectively controlling communication between said nozzles and the source of suction, and means responsive to engagement with the surface upon said movement of one of said nozzles into its said operative position on the surface to be cleaned to actuate said valve means and connect said one of said nozzles with the source of suction.

4. A surface cleaning tool comprising a body, a first and second nozzle in said body, a passageway in said body for connecting said nozzles to a source of suction, said nozzles being arranged in different planes disposed at an angle to each other and selectively movable into operative position with the surface being cleaned, valve means for selectively connecting said nozzles to the source of suction, and valve operating means movably mounted on said body and projecting beyond one of said nozzle planes for engagement with the surface being cleaned when the nozzle in said one plane is in its said operative position to thereby move said valve means to connect said nozzle in said one plane with the source of suction.

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