Nov. 5, 1957 F. A. GALL 2,811,738

RADIATOR TOOL AND BRUSH COMBINATIONS FOR VACUUM CLEANERS

Filed Dec. 16, 1953

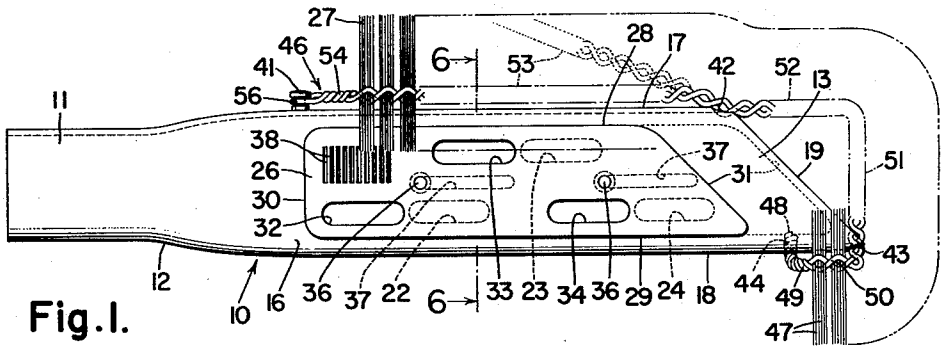


Fig.1.

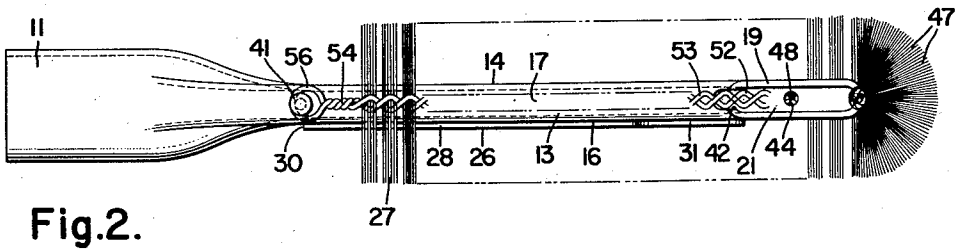


Fig.2.

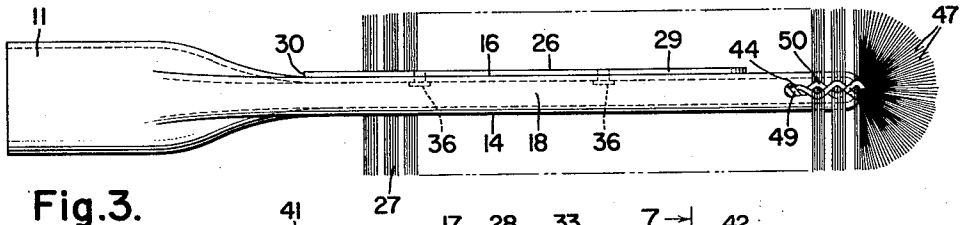


Fig.3.

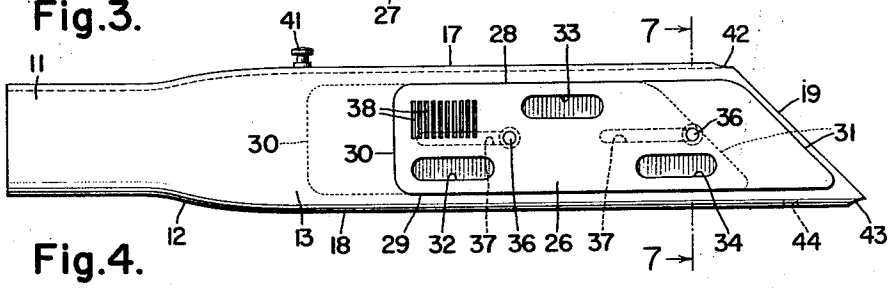


Fig.4.

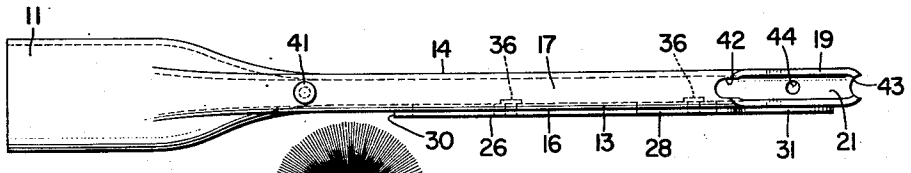


Fig.5.

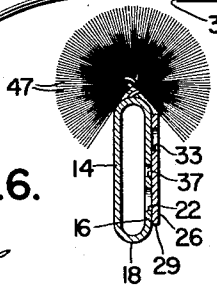


Fig.6.

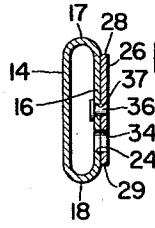


Fig.7.

WITNESS

William Martins

BY

INVENTOR.

Francis A. Gall

J. B. Stanford

ATTORNEY

United States Patent Office

2,811,738

Patented Nov. 5, 1957

2,811,738

RADIATOR TOOL AND BRUSH COMBINATIONS FOR VACUUM CLEANERS

Francis A. Gall, Springfield, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application December 16, 1953, Serial No. 398,501

3 Claims. (Cl. 15—328)

This invention relates to vacuum cleaners and more particularly to an improved combination radiator tool and brush adapted for use at the end of a hose for cleaning radiators and upholstery and for dusting; the primary object of the invention being to provide an improved device of this character.

Another object of the invention is to provide a radiator type cleaning tool having an improved brush that may easily be attached to or removed from the tool.

A still further object of the invention is to provide a radiator type cleaning tool that may quickly be transformed into an upholstery cleaning nozzle or into a dusting brush.

Another object of the invention is to provide an improved vacuum cleaner tool which has many different uses.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter described and claimed.

The features of the invention and advantages attained thereby will readily be understood from the following detailed description of a preferred embodiment of the invention illustrated in the accompanying drawings in which:

Fig. 1 is a front elevational view of a cleaning tool embodying the invention,

Fig. 2 is a top view of the tool shown in Fig. 1,

Fig. 3 is a bottom view of the tool shown in Fig. 1,

Fig. 4 is a view similar to Fig. 1 except that the brush has been removed and the slider, as shown in solid lines, has been moved to "open" position,

Fig. 5 is a top view of the device shown in Fig. 4,

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1,

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 4.

As seen in the drawings, the combination tool of the present invention comprises a member 10 of the type generally referred to as a radiator tool. The radiator tool 10 has a cylindrical tubular portion 11 which is of proper size for connection to the free end of a flexible hose (not shown) which, in turn, may be connected to the intake mouth of a vacuum cleaner (not shown). At a location indicated by the numeral 12, the cylindrical portion 11 blends into an oval tubular portion 13 having two flattened side walls 14 and 16 and two curved side walls 17 and 18. The free open end of the oval portion 13 is cut on a bevel 19 of approximately forty-five degrees (45°) to provide the characteristic thin pointed suction mouth 21 usually associated with radiator tools.

The present device differs from ordinary radiator tools heretofore manufactured in that, first, one of the flattened sides 16 is provided with three oblong apertures 22, 23 and 24, second, a slider 26 is slidably mounted on the outer face of the wall 16, and, third, the oval portion 13 is provided with means for mounting a dusting brush 27.

As best seen in Fig. 1, the apertures 22, 23 and 24 are staggered so that aperture 22, which is located nearest to the tubular portion 11, is adjacent to the curved wall 18, whereas the aperture 23, which is next remote from the portion 11, is located adjacent to the curved wall 17, and the aperture 24, which is nearest the beveled end 19, is adjacent to the curved wall 18. The slider 26 is in the form of a flat plate having parallel upper and lower edges 28 and 29, one square end edge 30 and one beveled edge 31, the latter having a forty-five degree (45°) slope so that the edge 31, as seen in Fig. 4, may extend parallel to the beveled end 19 of the oval tube 13. The slider 26 is provided with three oblong apertures 32, 33 and 34, these apertures being staggered in the same manner as the corresponding apertures 22, 23 and 24 are staggered and positioned so that when the slider 26 is moved to the position shown in solid lines in Fig. 4, the apertures 32, 33 and 34 in the slider 26 will be aligned exactly with the corresponding apertures 22, 23 and 24 in the wall 16. The slider 26 is slidably held to the wall 16 of the tubular portion 13 by means of a pair of headed rivets 36—36 which are secured to the slider 26 and pass through a pair of colinear slots 37—37 in the wall 16. The heads of the rivets 36—36 are larger than the width of the slots 37—37 and thus the slider 26 is held against the wall 16. The slider 26 is provided with a roughened thumb-engaging pad 38, thus facilitating the movement of the slider 26 along the wall 16. As best seen in Fig. 4, the length of the slots 37—37 are such that when the slider 26 is moved to the position where apertures 32, 33 and 34 align with the apertures 22, 23 and 24, the rivets 36—36 are located in one end of the slots 37—37, whereas when the slider 26 is moved to the position (Fig. 1) so that the apertures 22, 23 and 24 are covered by the slider 26, the rivets 36—36 are at the other end of the slots 37—37.

In order to support the dusting brush 27, the radiator tool 10 has been modified by, (*a*) the attachment of a headed pin 41 to the curved side 17 adjacent to the place 12 where the side wall 17 blends into the cylindrical portion 11, (*b*) the formation of a notch 42 at the place where the side wall 17 ends and the beveled mouth 21 begins, (*c*) the forming of a notch 43 at the extreme pointed end of the mouth 21, and (*d*) the provision of a small hole (44) in the curved side 18 close to the notch 43. The brush 27 is formed from a stiff spring wire 46 bent back on itself and twisted together to support a multiplicity of bristles 47 which radiate from the twisted wire 46 in an arc, as seen in Fig. 6, of approximately two hundred and eighty degrees (280°). In general the brush 27 is J-shaped in form and a short tightly twisted unbristled free end 48 of the twisted wires enters the hole 44. The end 48 is disposed at an angle of ninety degrees (90°) with respect to an unbristled portion 49 and a bristled portion 50. The sections 49 and 50 are disposed at an angle of 90° with respect to a bristled section 51. The section 51, which may be termed a link section, is disposed at an angle of 90° with respect to a bristled section 52. When the brush 27 is removed from and thus unsupported by the tool 10, the section 52 is disposed at an angle of approximately one hundred and fifty-five degrees (155°) with respect to a bristled section 53 which ends in a small unbristled section 54 having a free-end loop 56. However, when the brush 27 is installed on the tool 10, the section 53 is flexed downwardly from the dotted position shown in Fig. 1 to the position shown in solid lines in Fig. 1 which shows sections 53 and 54 to be parallel with the side wall 17. When this is done, the loop 56 is sprung over the headed pin 41 in such a manner that the sections 53 and 54 are held parallel to the side wall 17. This locks the brush 27 to tool 10 in such a manner that it will not be released during normal use of the tool and brush. This downward flexing causes

the brush section **53** to become substantially colinear with the brush section **52** and causes the brush section **53** to become parallel with the brush section **50**, which is also parallel with the brush section **52**.

Persons versed in the art will appreciate that the above described device may be used in several different ways. For example, when the brush **27** is removed from the tool **10** and the slider **26** is moved to close the apertures **22, 23** and **24** the tool becomes an ordinary radiator tool. This is clearly indicated by the dotted position of the slider **26** in Fig. 4. If the slider **26** is moved to the position shown in solid lines in Fig. 4, the apertures **32, 33** and **34** in the slider **26** will align with the apertures **22, 23** and **24** and the tool is converted into an upholstery nozzle. If the slider **26** is moved to close the apertures **22, 23** and **24**, and the brush **27** is attached in a manner shown in Fig. 1 the tool is converted into a dusting brush. If the slider **26** is moved from the closed position shown in solid lines in Fig. 1 to the position indicated by dotted lines, the apertures **32, 33** and **34** align with the apertures **22, 23** and **24** and the tool is converted into an upholstery nozzle provided with a dusting brush.

Having thus set forth the nature of the invention, what I claim herein is:

1. A combination tool adapted for use at the end of a vacuum cleaner hose, said tool comprising a cylindrical tubular portion for attachment to said hose, an oval tubular portion formed integral with said cylindrical portion and having a beveled open end, a flat wall formed on one side of said oval portion, said wall being provided with three oblong apertures staggered with respect to one another, a slider slidably mounted on said wall, said slider having three oblong staggered apertures which by movement of said slider may be aligned with said apertures in said flat wall, a pair of opposed curved side walls formed on said oval portion, one of said side walls being provided with a hole adjacent to the beveled end of said oval tubular portion, and the other of said side walls being provided with a headed pin located adjacent to the said cylinrical portion, and both of said curved side walls where they join the beveled end of the oval portion being provided with a notch, and a brush attachable to said tool, said brush having an unbristled end inserted into said hole in one of said curved walls, a first bristled section extending from said hole to one of said notches, a second bristled section extending between said notches and a third bristled section extending beyond said last notch, an unbristled section extending beyond said third bristled section, and a loop carried at the extreme end of said last named unbristled section, said loop engaging said headed pin, said third bristled section and said last unbristled end forming a member bent outwardly away from a parallel position with respect to said curved side walls prior to said loop being engaged with said pin.

2. A combination tool adapted for use at the end of a vacuum cleaner hose, said tool comprising a tubular portion for attachment to said hose, a flattened tubular portion attached at one end to said tubular portion and at its other end formed with an open end, a flat wall formed on one side of said flattened portion, said wall being provided with a plurality of apertures, a slider slidably mounted on said wall, said slider having a plurality of apertures which by movement of said slider may be aligned with said apertures in said flat wall, a pair of opposed edge walls formed on said flattened portion, one of said edge walls being provided with a hole, and the other of said edge walls being provided with a headed pin, a brush having an end inserted into said hole in one of said edge walls, a first brush section extending from said hole to the open end of said flattened tubular portion, a second brush section extending across the open end of said flattened tubular portion, and a third brush section extending from said second section and having a portion which extends at an acute angle away from the edge wall which carries carries said headed pin prior to engagement therewith and a loop carried at the extreme end of said third brush section, said loop engaging said headed pin.

3. A combination tool adapted for use at the end of a vacuum cleaner hose, said tool comprising a tubular portion for attachment to said hose, a flattened tubular portion attached at one end to said tubular portion and at its other end formed with an open end, a flat wall formed on one side of said flattened portion, said wall being provided with a plurality of apertures, a slider slidably mounted on said wall, said slider having a plurality of apertures which by movement of said slider may be aligned with said apertures in said flat wall, a pair of opposed edge walls formed on said flattened portion, one of said edge walls being provided with a hole, and the other of said edge walls being provided with a headed pin, and both of said edge walls being provided with a notch, a brush attachable to said tool, said brush having an end inserted into said hole in one of said walls, a first brush section extending from said hole to one of said notches, a second brush section extending between said notches and a third brush section extending beyond said last notch, a fourth brush section extending beyond said third brush section, and a loop carried at the extreme end of said fourth brush section, said loop engaging said headed pin, one of said last two named brush sections forming a member bent outwardly away from a parallel position with respect to said edge walls prior to engagement of said loop with said pin.

References Cited in the file of this patent

UNITED STATES PATENTS

1,053,665	Spencer	Feb. 18, 1913
2,206,738	Brock et al.	July 2, 1940
2,243,120	Pollitt	May 27, 1941
2,659,924	Forsberg	Nov. 24, 1953

FOREIGN PATENTS

1,046	Great Britain	Nov. 20, 1897
502,239	Great Britain	Mar. 14, 1939
540,869	Germany	Dec. 20, 1931
625,072	Great Britain	June 21, 1949