March 19, 1935. D. B. REPLOGLE ET AL 1,994,872

DOUBLE FACED FLOOR TOOL FOR AIR METHOD CLEANING SYSTEMS

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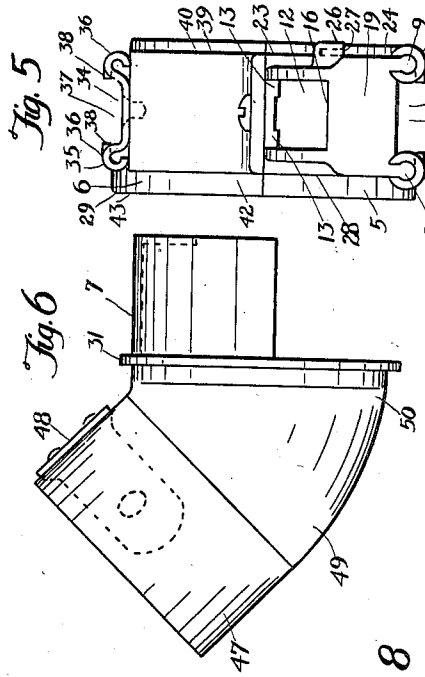


Fig. 5

Fig. 6

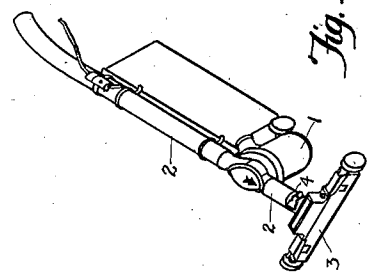


Fig. 1

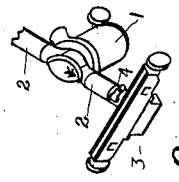


Fig. 2

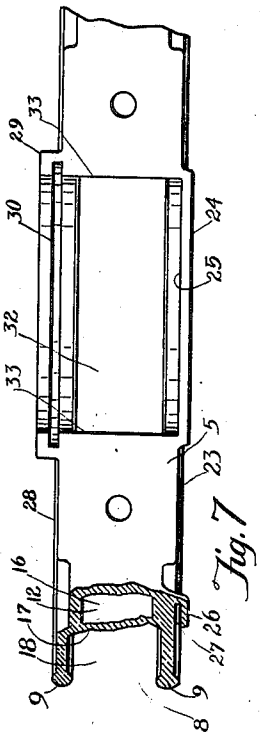


Fig. 7

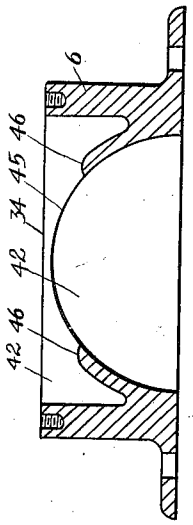


Fig. 8

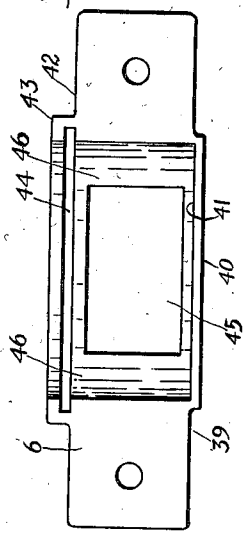


Fig. 9

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Fig. 3

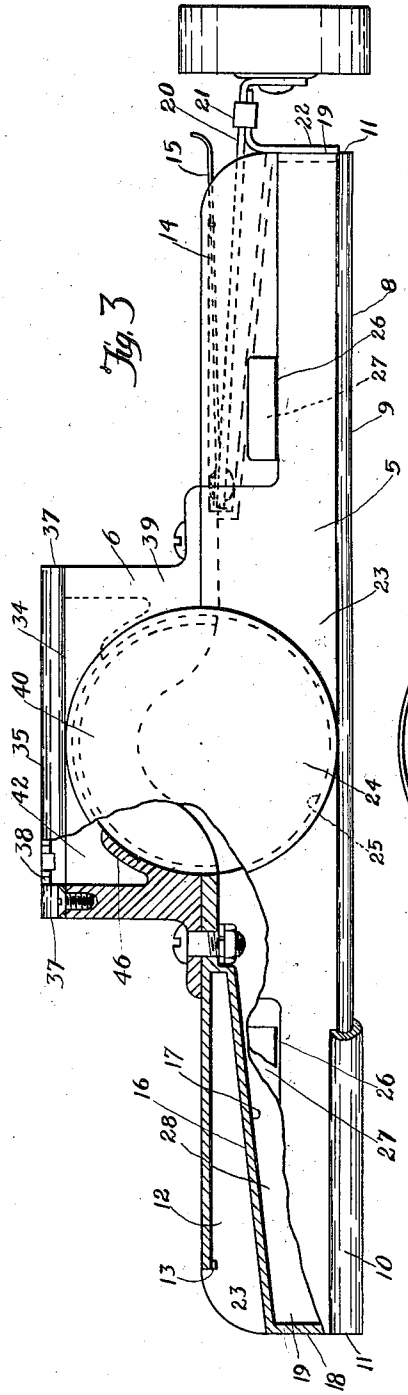
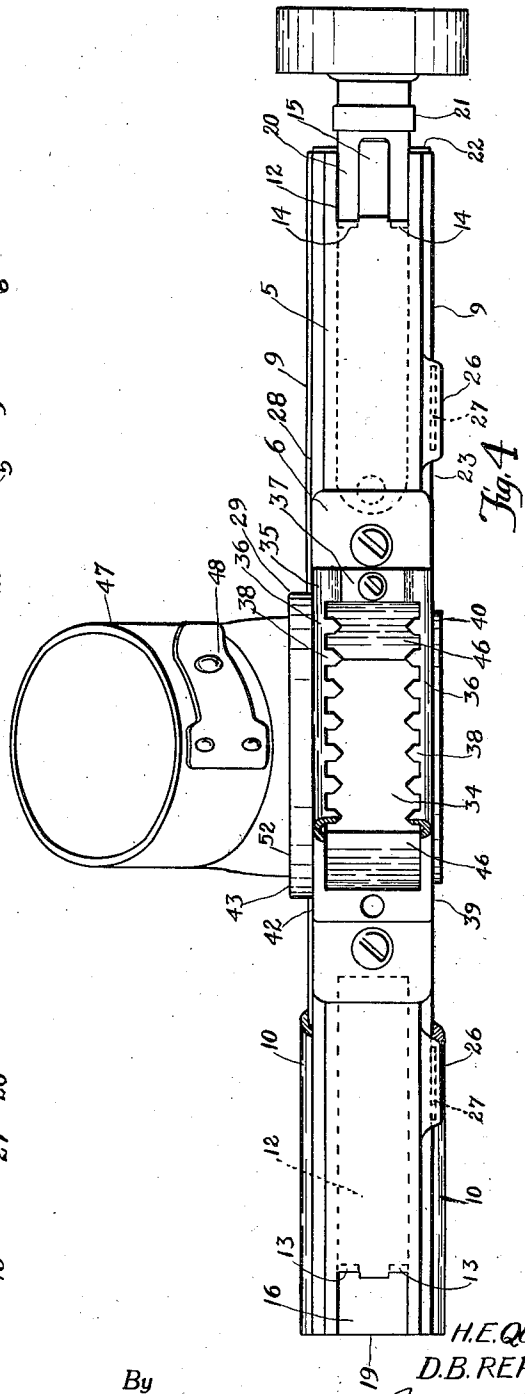


Fig. 4



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DOUBLE FACED FLOOR TOOL FOR AIR METHOD CLEANING SYSTEMS

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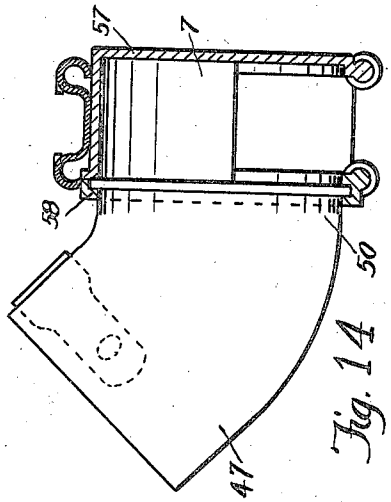


Fig. 14

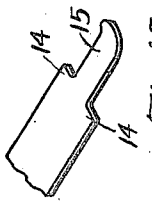


Fig. 15

Fig. 12

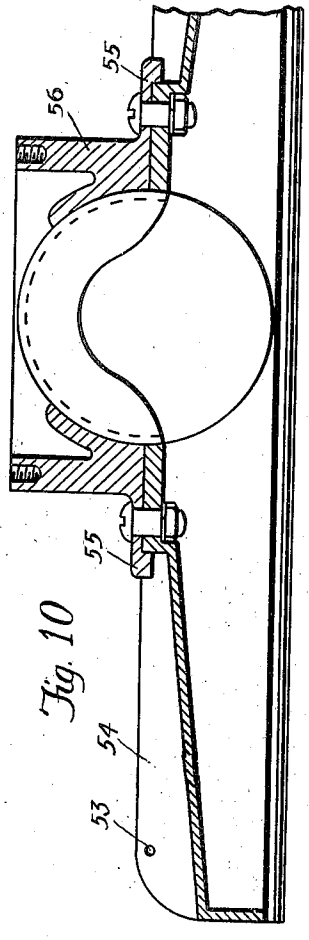


Fig. 10

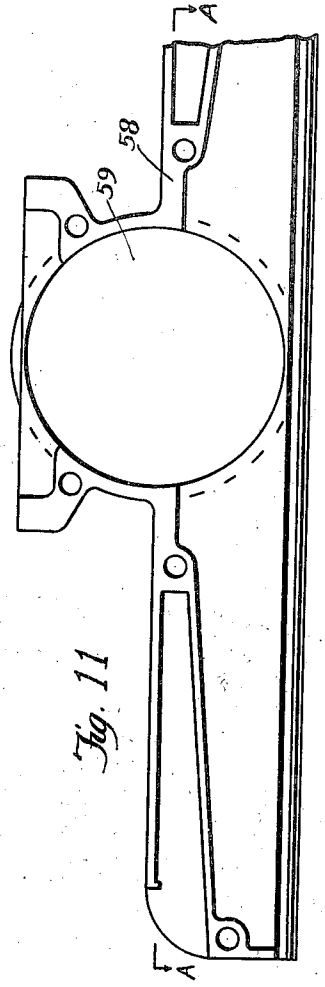


Fig. 11

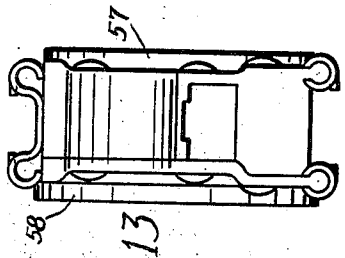


Fig. 13

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UNITED STATES PATENT OFFICE

1,994,872

DOUBLE FACED FLOOR TOOL FOR AIR-METHOD CLEANING SYSTEM

Daniel Benson Replogle, Berkeley, Calif., and Harold E. Queen, Washington, D. C., assignors, by direct and mesne assignments, to Citizens Trust Company, Toledo, Ohio, a corporation of Ohio, as trustee

Application May 24, 1932, Serial No. 613,290
In Great Britain April 19, 1932

10 Claims. (Cl. 15—155)

This invention pertains to the application tools through which suction is applied, particularly to floors and floor coverings, by means of so-called vacuum cleaner systems; but is more particularly applicable to that form of electrical motor driven portable cleaner of the type commercially known under the registered trade-mark "Air-Way", in which suction producing means are directly connected to the suction pipe that carries the floor cleaning tool; and are moved about manually with the pipe, or some part of it, used as a handle.

According to the preferred embodiment of the invention the floor tool is provided with two mouths, one of which may be employed for ordinary floor cleaning purposes, while the other is of restricted size and is employed especially for thread picking purposes. Devices of this general character are known per se and require valve means for selectively cutting off one or the other mouth, whichever is uppermost, from the outlet pipe or conduit which is connected to a suitable source of suction. In previous devices of this general character difficulty has been experienced in maintaining a rotatable but fluid tight connection between the floor tool or nozzle and the outlet conduit in which is incorporated the valve. According to the present invention we overcome this difficulty by providing a nozzle composed of two sections, including complementary portions adapted to rotatably engage a member carried by the hollow handle. When the two sections of the nozzle are secured together they engage the joint member with a fluid tight fit, which permits of relative rotation between the nozzle and hollow handle, while preventing accidental removal so long as the two sections of the nozzle remain assembled. An added advantage of this construction resides in the fact that the two parts of the nozzle may be economically and efficiently manufactured.

Another feature of the invention is the novel form of stroker or floor engaging member employed in connection with the nozzle or floor tool.

Other features of the invention reside in improved details of construction of the floor tool and its attachments.

The invention will be more apparent from a consideration of the specific embodiments shown in the accompanying drawings, which are intended as illustrative only.

In the drawings:

Fig. 1 is a perspective view, on small scale, of the entire cleaner with the tool attached, and with the longer mouth downward;

Fig. 2 is a view similar to that in Fig. 1, but with the short mouth downward;

Fig. 3 is a front elevation of the tool with one roller and spring removed, the other spring being shown in dotted lines, the front wall partly broken away to disclose the interior spring pocket and the valve shoes, and the fibre stroker partly broken away;

Fig. 4 is a top plan view of the tool with the fibre stroker of the short mouth partly broken away;

Fig. 5 is an end view of the upper and lower members joined, but with the valve member removed;

Fig. 6 is a side view of the valve member;

Fig. 7 is a top view of the central part of the lower member;

Fig. 8 is a sectional elevation of the upper member;

Fig. 9 is an underside view of same;

Fig. 10 is a sectional front elevation of a modified form of the tool;

Fig. 11 is a front elevation of the rear member of a second modification;

Fig. 12 is a sectional plan of the modification shown in Fig. 11, taken on line A—A;

Fig. 13 is an end view of the front and rear members of the second modification, and

Fig. 14 is a sectional elevation of the second modification.

Fig. 15 is a fragmentary detail view showing one end of one of the spring fingers of the supports for the end rollers.

Characters of reference used in any of the views denote like or similar parts where they are used in the other views.

In Figs. 1 and 2, a suction producing means 1 is directly connected to the suction pipe handle 2. The subject of this invention is the tool 3 attached to one end of the pipe 2 by means of the slip joint 4.

In Figs. 3 and 4, and 5 to 9, numeral 5 denotes the lower member of the tool, and numeral 6 the upper member when in the attitude for general cleaning. The valve member is denoted by numeral 7.

Referring particularly to Figs. 3, 4, 5 and 7, the lower member 5 is a chamber having a mouth 8 with lips 9—9, upon which are slid strokers 10—10, leaving at either end of the tool openings 11—11. In the upper part of member 5 and opening toward either end of the member are pockets 12—12 with lugs 13—13 at the open end of either pocket adapted to engage shoulders 14—14 (Fig. 15) on roller springs

15—15. The bottoms 16—16 of pockets 12—12 form the top 17 of chamber 18 of member 5. The ends 19—19 of the member 5 and the lips 9—9 form the previously enumerated end openings 11—11. Roller shanks 20—20, by means of clasps 21—21, carry flat covers 22—22 adapted to automatically uncover or cover end openings 11—11 according as downward pressure is applied to the tool or relieved. The front wall 23 of member 5 carries a semi-circular boss 24 with semi-circular recess 25 on the inner side adapted to receive and assist in centering valve member 7. The small bosses 26—26 with downwardly opening pockets 27—27 are adapted to receive the hooks of an attachable brush not shown. The rear wall 28 of member 5 has an annular boss 29 with an upwardly opening semi-circular groove 30 adapted to receive flange 31 of valve member 7. The top 17 of chamber 18 is cut at the center to form valve port 32 defined by shoes 33—33 and walls 23 and 28.

As shown in Figs. 3, 4, 5, 8 and 9, the upper member 6 is a chamber having a mouth 34 with coplanar edges to which is fastened a stroker 35 having beads 36—36 and end openings 37—37. Beads 36—36 have coplanar hooks 38 pointing toward the center line of mouth 34. The front wall 39 of member 6 carries a semi-circular boss 40 with semi-circular recess 41 on the inner side adapted to receive and assist in centering valve member 7. The rear wall 42 of member 6 has an annular boss 43 with a downwardly opening semi-circular groove 44 adapted to receive flange 31 of valve member 7. The lower part of member 6 has a port 45 defined by shoes 46—46 and walls 39 and 42.

In Fig. 6 the valve member 7 is a tubular conduit having a cylindrical section 47 adapted to slip over conduit pipe 2, thus forming slip joint 4, and be retained by latch 48. Cylindrical section 47 merges into an elbow 49 of approximately 40 degrees. Elbow 49 in turn merges into a cylindrical section 50 which has its lower half cut away, leaving a half cylindrical shape which constitutes a valve which closes either port 45 or port 32, according to which is uppermost. Upon the rear part of cylindrical section 50 is formed a flange 31 adapted to engage grooves 44 and 30 constituting a rotatable joint 52 allowing reversement of the tool about valve member 7.

In Fig. 10 there is shown a modified form of the invention in which the top of the pocket is omitted from the lower member and its function is performed by a pin or bolt through holes 53—53 in lower member 54, and by the tips 55—55 of upper member 56.

In Figs. 11 to 14 is shown a second modified form of the invention in which the tool is divided, for purposes of casting and assembling about the flange 31, into front member 57 and rear member 58. In assembling, the shank 47 of valve member 7 being smaller than cylindrical section 50 is threaded through the hole 59 in rear member 58.

In operation, the main mouth is used in general cleaning, but there are times when a concentrated swift current of air is needed at a single point to pick up recalcitrant threads imbedded in the rug. To meet this condition, the short inlet mouth is provided on the tool, which mouth may be brought into use by revolving the tool on the handle.

The lips of the mouths of the tool are provided with the renewable strokers 10—10 and 35 of hard fibre, rubber, rawhide or other suitable material, in order that fabrics being cleaned shall not be discolored and that wooden or linoleum covered floors shall not be scratched. In the construction shown, the stroker 35 on the shorter mouth 34 is shaped to form hooks or notches 38 to assist in removing recalcitrant threads from rugs. These hooks 38 point inwardly of the mouth and lie parallel to the surface being cleaned. The strokers 10—10 of the main mouth 8 may be smooth or may be equipped with hooks 53 for a short distance at their mid section.

When the main mouth of the tool is applied to rugs it is supported by rollers at either end of the tool. These rollers are connected to the tool by springs of such tension that the mouth of the tool bears lightly on the rug. Either or both of these rollers are quickly removable to allow cleaning along base boards.

When the short mouth of the tool is applied to rugs to remove persistent threads the tool is not supported by the rollers and any pressure desirable may be used against the rug.

In the construction shown in Figs. 3 to 10, the tool is made in upper and lower halves suitably joined together, each having a semi-circular annular groove adapted to fit over a flange on the valve member forming a revolvable joint. The invention also contemplates the division of the tool into front and rear members, as shown in Figs. 11 to 14, which are suitably joined together after being assembled about the flange of the valve member. The tool may be made of any suitable material, as for example cast metal, die cast synthetic resin, or it may be stamped from sheet metal. According to the specific embodiment of the invention as illustrated in the drawings, die cast aluminium is contemplated.

We claim:

1. In combination with a suction handle having an annular rib adjacent one end, a suction nozzle formed of two sections, each section carrying a complementary portion of a groove adapted to rotatably engage said rib when the two sections of the nozzle are secured together, and means for securing the two sections of the nozzle together upon said handle.

2. A floor tool as defined in claim 1, in which the two sections are superposed.

3. A floor tool as defined in claim 1, in which one of the sections constitutes a rear wall for said tool.

4. A floor tool as defined in claim 1, in which one of the sections constitutes a rear wall for said tool and is provided with an opening to permit the outlet pipe to be passed therethrough in assembling the device.

5. In combination with a suction handle, a valve member carried thereby, an annular rib carried by the valve member, a suction nozzle formed in two sections, each section carrying a suction opening and each section carrying a complementary portion of an annular groove rotatably engaging the rib of said valve member when the two sections of the nozzle are secured together.

6. A floor tool comprising two superposed sections, each section having a mouth portion, one of which is of reduced size, the section having the reduced mouth having overhanging end portions spaced from the other section and forming pockets to receive supports for end rollers; and retaining means carried by the other of said members co-

operating with said pockets for holding said supports.

7. A suction cleaner nozzle comprising two superposed sections each having a suction inlet, one of said sections extending laterally beyond the other, laterally extending flanges carried by the sections and fastening means extending through said flanges for securing said sections together, the ends of the flanges of one section overhanging and being spaced from a portion of the second section to form pockets for retaining the ends of supports for end rollers, and retaining means carried by the second section cooperating with said pockets for holding said supports.

8. A floor tool for a suction cleaner comprising a nozzle having end openings adjacent the floor, end pockets formed in the nozzle above the openings, end rollers for said nozzle, spring supports for said end rollers fitting in said pockets, adjustable covers for said end openings, each having an arm extending at an angle to the cover and parallel to the adjacent spring support, and clamps encircling said arms and said supports, whereby the end covers are yieldingly mounted with reference to the end openings.

9. A detachable stroker member for floor tools of suction cleaners, comprising a continuous rectangular strip of non-metallic material having cut-away end portions providing end openings, and beaded side portions adapted to engage the floor.

10. A detachable stroker member for floor tools of suction cleaners, comprising a continuous rectangular strip of non-metallic material having cut-away end portions providing end openings, and beaded side portions adapted to engage the floor, said beaded portions being provided with thread-picking hooks.

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