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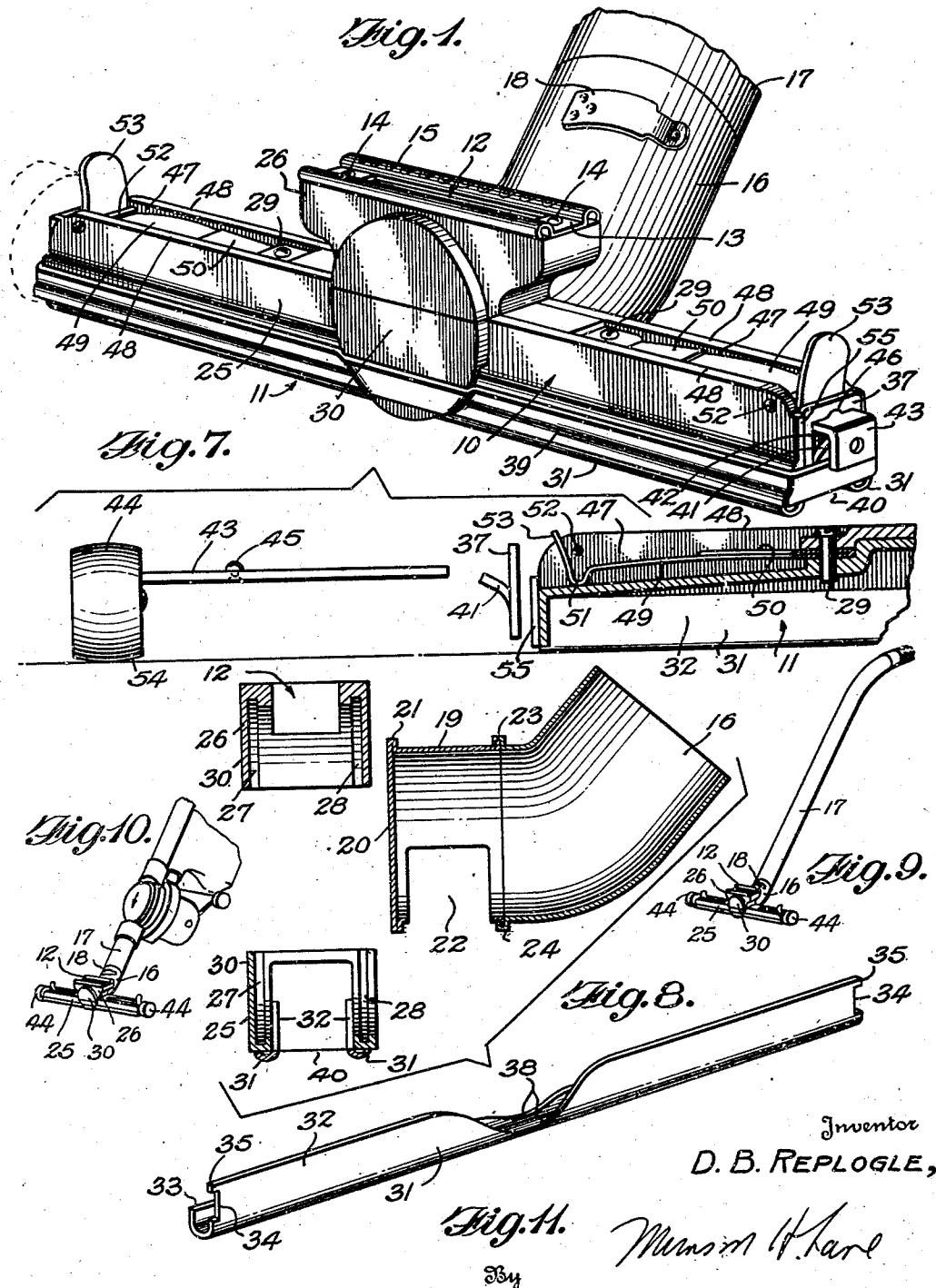
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2,190,679

SWEEPER FLOOR TOOL

Filed Oct. 15, 1936

2 Sheets-Sheet 1



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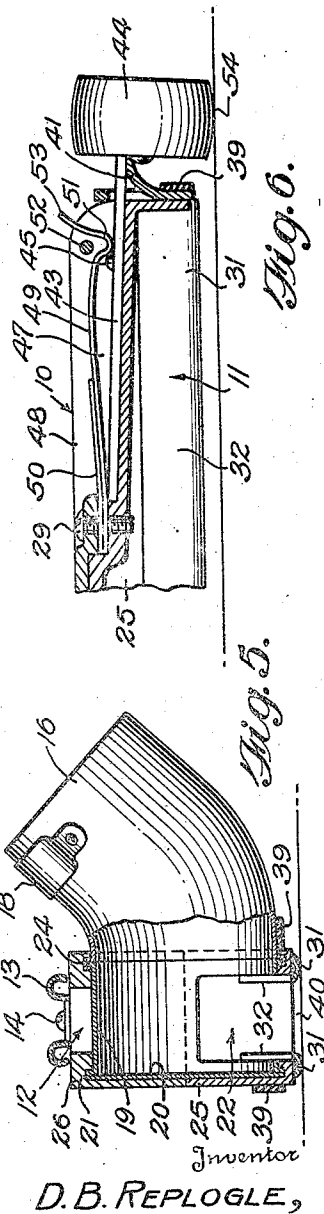
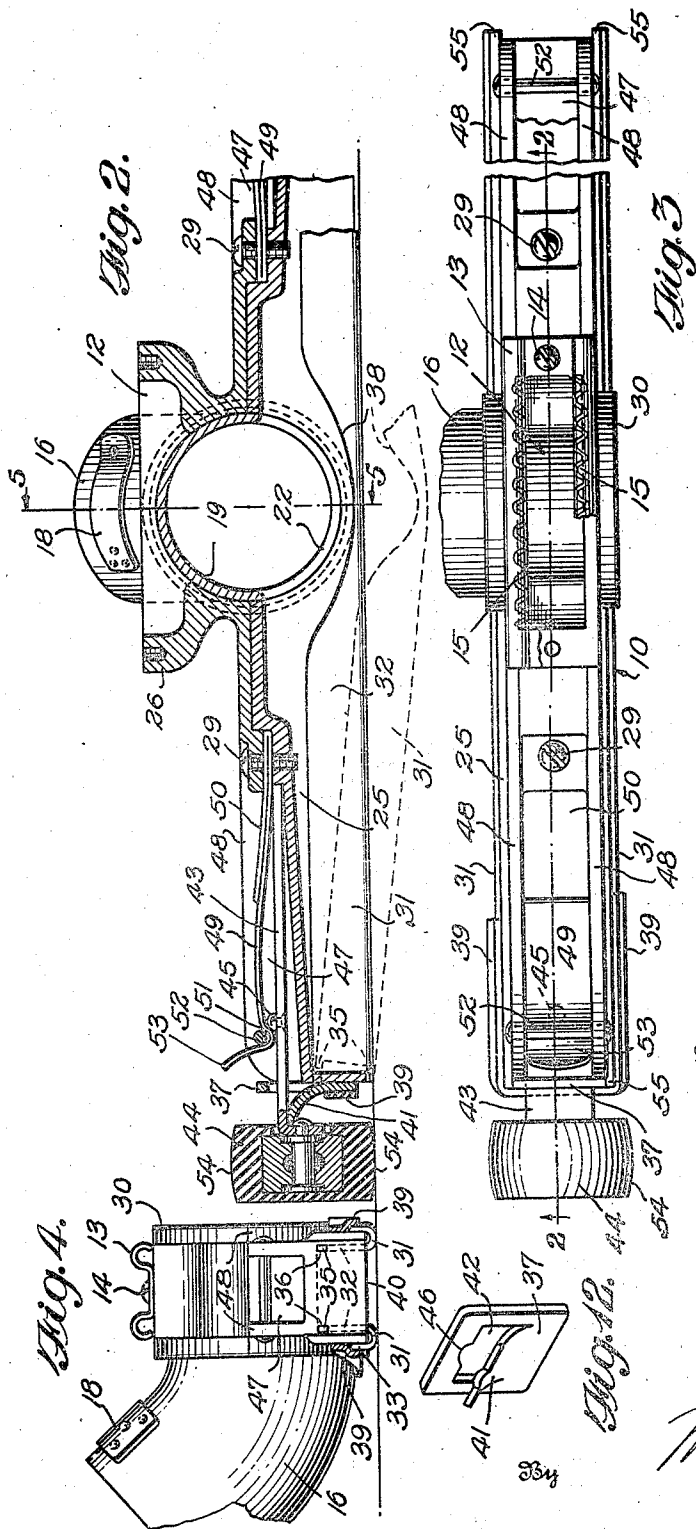
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UNITED STATES PATENT OFFICE

2,190,679

SWEEPER FLOOR TOOL

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Application October 15, 1936, Serial No. 195,789

7 Claims. (Cl. 15—157)

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.

The invention in certain of its aspects is in the nature of an improvement in the type of apparatus disclosed in Replogle and Queen Patent No. 1,994,872 dated March 19, 1935, wherein the floor tool or nozzle is of the reversible double-mouthed type and is provided with a valve which forms an extension of the outlet pipe or suction handle which serves to cut off whichever mouth is uppermost from the source of suction. As disclosed in said patent an annular rib is provided at the junction between the valve member and the outlet pipe, and the suction nozzle is formed in two sections, each section carrying one of the mouths of the tool and each section carrying a complementary portion of an annular groove rotatably engaging the rib of the valve member, when the two sections of the nozzle are secured together.

According to the aforesaid prior patent the lower section of the outlet pipe, the valve member and the rib may be formed of a single piece by stamping or die casting operations and to permit of these operations the front of the valve member was partially cut away.

According to the present embodiment of the invention the valve member may be in the form of a cap, the front of which is closed and is adapted to fit into a boss in the front of the nozzle stiffening the construction and providing more accurate rotation. The rear end of the cap may be flanged and secured by means of a standing seam to the lower end of the outlet pipe, the junction between the valve and outlet pipe forming the rib which coacts with the grooves in the complementary sections of the nozzle.

Another feature of the present invention is the improved form of lips or stoker members with which the floor tool is equipped.

Still another feature of the invention is the provision of a sealing strip which encircles the entire tool as well as the outside of the stoker members.

Another feature of the invention is the improved form of end closure plates.

Still another feature is the improved form of end rollers and supports therefor.

Other objects and advantages will appear from the further detailed description of the invention.

The invention will be more readily understood by reference to the accompanying drawings in which is set forth for the purpose of illustration an illustrative embodiment of the inventive thought involved, it being understood that the invention is not limited to such details of construction.

In said drawings:

Fig. 1 is a perspective view of the floor tool embodying my invention; one of the end rollers being removed.

Fig. 2 is a sectional view of the tool, portions being broken away, the section being taken on the line 2—2 of Fig. 3.

Fig. 3 is a top plan view of the tool, portions being broken away.

Fig. 4 is an end view, with portions in section.

Fig. 5 is a section on line 5—5 of Fig. 2.

Fig. 6 is a fragmentary sectional view of one end of the tool showing the roller mounting.

Fig. 7 is an exploded view showing the roller mounting.

Fig. 8 is an exploded sectional view showing the principal portions of the floor tool separated one from the other.

Fig. 9 is a diagrammatic view showing the tool connected to an elongated tubular handle.

Fig. 10 is a diagrammatic view showing the floor tool as forming part of a portable electric cleaner.

Fig. 11 is a detailed perspective view of one of the stokers.

Fig. 12 is a detailed perspective view of one of the fiber end plates.

Referring to the drawings 10 denotes generally a floor tool or suction nozzle shown as provided with oppositely disposed inlet mouths 11 and 12. The mouth 11 extends the full length of the tool and is employed for ordinary floor sweeping operations. The mouth 12 is reduced in size and is intended for use under special conditions where a more concentrated and swifter air-stream is required than is ordinarily needed. This mouth may be provided with a detachable stoker member 13 secured to the nozzle proper as by means of screws 14. This stoker member may be suitably roughened as indicated at 15 to aid in removing recalcitrant threads, ravelings or caked earthy spots on the floor.

The floor tool is provided with an outlet pipe 16 for dust laden air, which may be detachably connected to another section 17 communicating with a source of suction which may be either remote or carried as a composite part of a portable electric

suction cleaner. The sections 16 and 17 may be connected by a latch member 18 and together serve as a suction handle and means for propelling the apparatus across the floor. This suction handle may be in one piece if desired or may be composed of as many sections as circumstances may require. These sections may be rigid or flexible or both flexible and rigid and may be composed of any suitable material as metal, hard fiber, Bakelite or rubberized material.

According to the present embodiment of the invention a valve member 19 is secured to the lower end of the outlet pipe 16 and as shown is in the form of a cap, the front portion 20 of which is circular and is provided with a flange 21. The cap is cut away as at 22 to provide an inlet opening leading from the interior of the nozzle and adapted to be placed in communication with either the mouth 11 or 12 of the nozzle whichever is lowermost while at the same time the uncut cylindrical wall of the valve cuts off communication between the other mouth and the outlet pipe. The rear end of the valve or cap member may be flanged as at 23 and a flange 24 on the outlet pipe is rolled over the flange 23, the two being pressed together tightly so as to secure the two sections firmly together. The junction between the valve member 19 and the outlet pipe 16 provides a rib similar to the rib 21 at the front of the cap.

As shown the nozzle proper is composed of two complementary sections 25 and 26, the larger of which 25 includes the mouth 11 and the smaller includes the mouth 12. These sections may be composed of light metal such as aluminum or may be formed of plastic synthetic material such as phenolic condensation products commercially known as "Bakelite". These two sections are provided with complementary halves of the circular grooves 27 and 28 into which revolvably fit the ribs 21 and 24 of the composite valve and outlet pipe member, when the two sections 25 and 26 of the tool are secured together by any suitable fastening means as for example the screws 29, 28.

These two screws are the only fastening means required for holding the two parts of the nozzle together.

When the two sections are assembled as indicated in Fig. 1 a circular boss 30 will be provided at the front end of the tool, against which the closed end 29 of the valve 19 fits snugly, strengthening the apparatus at this point and providing for accurate rotation.

The ribs 21 and 24 fit within the grooves 27 and 28 in the nozzle head.

At the front and rear of the enlarged mouth 11 of the floor tool, stokers 31, 31 are preferably provided. These stokers may be formed of hard fiber or other suitable non-metallic and durable material, which will not mar the floor coverings when coming into contact therewith. As shown the stokers are channel shaped, one side 32 of the channel being higher than the other 33. The lower side is adapted to fit the outside of the nozzle and the member 32 to fit the inside. The channel shaped stokers are tightly fitted over the front and rear lips of the nozzle mouth 11. The ends of the sides 32 of the stokers are cut away at 34 providing tabs 35 which fit in mortised openings 36 formed in the ends of the floor tool. The lower limit of the cut away portion 34 is at substantially the same level as the top of the opposite side 33 of the stoker.

Each stroker is arcuately cut away intermediate

its ends as indicated at 38. These cut away portions are to enable the stokers to fit the rounded boss 30 at the front of the tool and the outlet pipe 16 at the rear of the tool, thus enabling the tool to be reversed as described in my patent No. 1,994,872. The routed or cut out portions 38 of the stokers also serve a second important function in removing and re-applying the stokers to the nozzle as will be apparent from the drawings. To remove the stokers they are pulled 10 downwardly at the center portion thus springing the stokers at the middle, thereby retracting the end tabs 35 from the mortises 36.

In applying the stroker to the nozzle it is simply bent intermediate its ends, then pressed up 15 straight causing the end tabs to be engaged in the mortises and the stroker to be locked in place with the side 33 extending along the interior of the nozzle and the side 32 extending along the exterior. I have found that hard fiber is particularly adapted for use with stokers of this type for the reason that it is relatively rigid when applied to the floor tool but nevertheless possesses sufficient flexibility to permit a stroker composed thereof to be bent intermediate its ends when 25 such stroker is cut away as herein indicated.

To prevent leakage between the stokers and the body of a nozzle, the flexible band 39 preferably of rubber is placed around the tool overlapping the upper portion of the exterior of the 30 stokers. This band also serves as a bumper to prevent marring of the furniture or the like with which the tool may come in contact.

The stroker members 31 form, with the ends of the tool, end openings 40, into which air is adapted 35 to be drawn laterally. Automatically adjustable lids or plates 37 are provided for opening, closing or varying the end openings according to the degree of downward pressure applied to the tool. These lids are shown as rectangular 40 in shape, each being provided with a struck out tab 41 leaving an end opening 42 through which the shank 43 of an end roller 44 is adapted to pass.

A rivet or stop member 45 may be mounted on the top of the shank 43 and a corresponding cut 45 away portion 46 may be provided in the end plate 37 at the upper margin of the opening 42. The roller shank is adapted to fit into an end pocket 47 in the floor tool, the sides 48, 49 of which pocket extend upwardly from the body of the floor tool 50 while the top of the pocket is formed of a spring-like member 49 fitting between the side walls 48 and held in place by the assembling screw 29 which as previously described holds the upper and lower sections of the tool together. As shown 55 this spring is leaf shaped and is reinforced at the inner end as indicated at 50. At the outer end there is provided a catch member 51 which is adapted to engage beyond the rivet or stop 45 on the roller shank and hold the roller assembly in position. The spring 49 exerts a constant downward pressure on the roller shank, which pressure may be overcome by pressure applied to the tool. A cross pin 52 limits the upward movement of the spring 49. A finger piece 65 53 is provided for raising the spring from the catch member 45 to release the end rollers and permit removal thereof for repair or other purposes as for example when it becomes desirable to place the end of the tool in a corner for removing the accumulated dust therefrom.

It will be noted that the end roller 44 is provided with a crowned surface 54, the curvature of which may be so selected with reference to the length of the roller shank that the crowned 75

surface will always be in contact with the floor.

As will be apparent from the drawings, horns, ears, or projections 55 are provided at the ends of the floor tool which serve as guideways for the end plates 37, the elastic band extending between said horns and the outside of the said end plates. Struck out tabs 41 which engage downturned portions of the roller shank serve to hold these lids tightly against the ends of the nozzle. It will be apparent that both ends of the floor tool are alike and the description of the end pocket, roller supports, etc. for one side is applicable to the other as well.

Operation

The apparatus may be used for ordinary floor cleaning purposes or for special cleaning operations where a high degree of vacuum is required, according to which mouth of the tool is placed in contact with the floor. For removal of ravelings or the like the reduced mouth 12 is employed, the tool being reversed from the position shown in Fig. 1 by simply turning the nozzle about the combined handle and valve. The stroker 13 with the roughened portion 15 facilitates this special work.

For ordinary floor cleaning purposes the larger mouth 11 is employed. Air is drawn into the nozzle thru the fabric or carpet and the end openings 40 may be automatically varied by the position of the fiber lids to avoid the sticking to the floor, if much downward pressure is applied to the tool. Owing to the crowned shape of the rollers, marring of the floor by engagement of sharp edges is avoided. The rollers and roller shanks may be readily removed when required as for example when it is desired to place one end of the floor tool in a corner for withdrawing accumulated dust into the nozzle through one of the end openings 41.

Where a metal floor tool is employed the removable fiber stokers 31 prevent contact between the metal lips of the tool and the surface covering being cleaned. These stokers are readily assembled by bending at the cut away center portion and then snapping into place and are similarly removed by catching hold of the stroker at the cut away portion and drawing the same downwardly thus disengaging the ends of the stokers from the mortises formed in the ends of the tool.

The invention has been described in detail for the purpose of illustration but it will be apparent that many modifications and variations may be resorted to without departing from the spirit of the invention.

I claim:

1. In a suction cleaner comprising in combination with a suction outlet pipe, 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; the improvement wherein the valve constitutes a separate cap having a flange secured to the outlet pipe forming the rib which engages in said groove, the front of the cap being closed and abutting against the interior of the front of the nozzle, the outer surface of the nozzle being bulged to form a circular boss which is concentric with and slightly greater in diameter than the cross-sectional area of the suction pipe where the cap is secured thereto, said cap including also a second rib at the front portion thereof which fits in said circular boss.

2. A suction cleaner, comprising a suction nozzle, front and rear stroker members for said nozzle, each stroker having end tabs projecting through mortises formed in the ends of said nozzle, and being cut away intermediate its ends to enable the stroker to be bent and the ends of the stokers withdrawn from the mortises in the ends of the nozzle.

3. A suction cleaner as set forth in claim 2, wherein each stroker is channel shaped and fits over a lip of the nozzle, one side of the channel extending along the interior of the nozzle, and the other side along the exterior, and means for forming a fluid tight connection between the stroker and the nozzle.

4. A suction cleaner as set forth in claim 2, wherein each stroker is channel shaped and fits over a lip of the nozzle, one side of the channel extending along the interior of the nozzle, and the other side along the exterior, and means for forming a fluid tight connection between the stroker and the nozzle, said means comprising a continuous flexible band fitting around the exterior of said nozzle and covering the upper edges of the exterior portions of the stokers.

5. A stroker for use with a suction cleaner nozzle comprising an elongated member of channel shape, having tabs at the ends of one side of the stroker adapted to fit in mortises formed in the ends of the nozzle, and being arcuately cut away intermediate its ends to permit the stroker to be bent for withdrawing the end tabs from the mortises when the stroker is to be removed from the nozzle.

6. For use with a suction cleaner nozzle which is rotatable about an outlet pipe, a floor engaging stroker for said nozzle composed of relatively rigid non-metallic material having sufficient flexibility to permit bending, said stroker having end tabs adapted to be projected through mortises formed in the ends of the nozzle, and being cut away intermediate its ends for the dual purpose of accommodating the outlet pipe and to enable the stroker to be bent and the ends of the stroker withdrawn from the mortises in the end of the nozzle.

7. A floor engaging stroker as set forth in claim 6 composed of hard fiber.

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