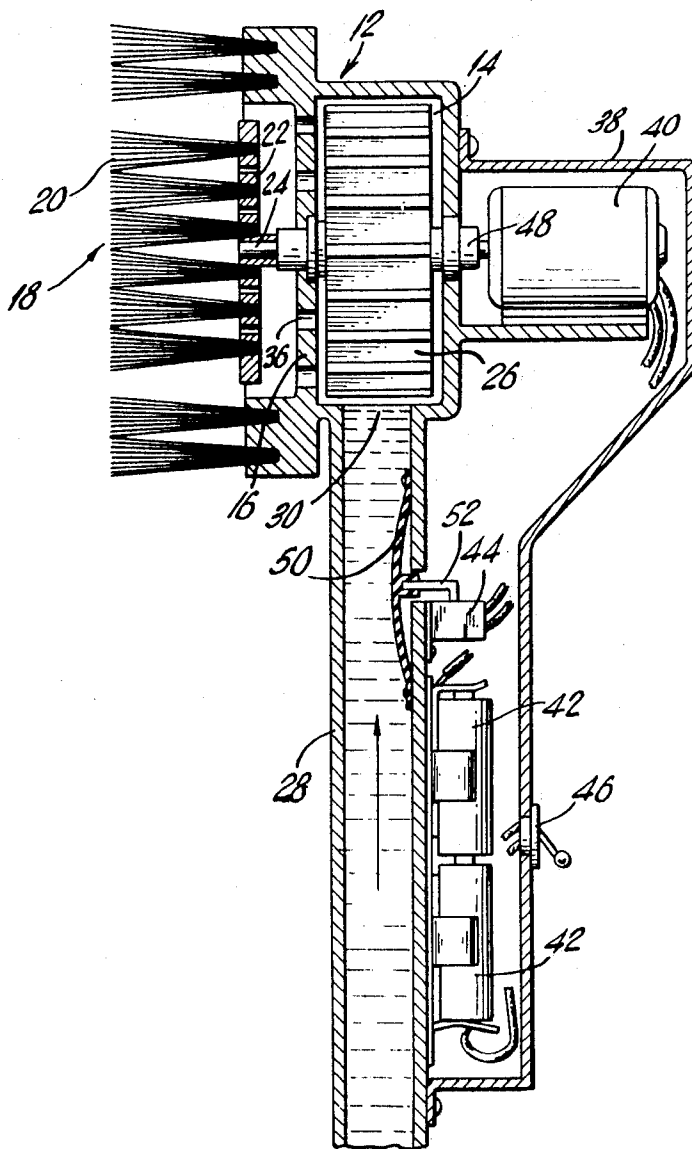
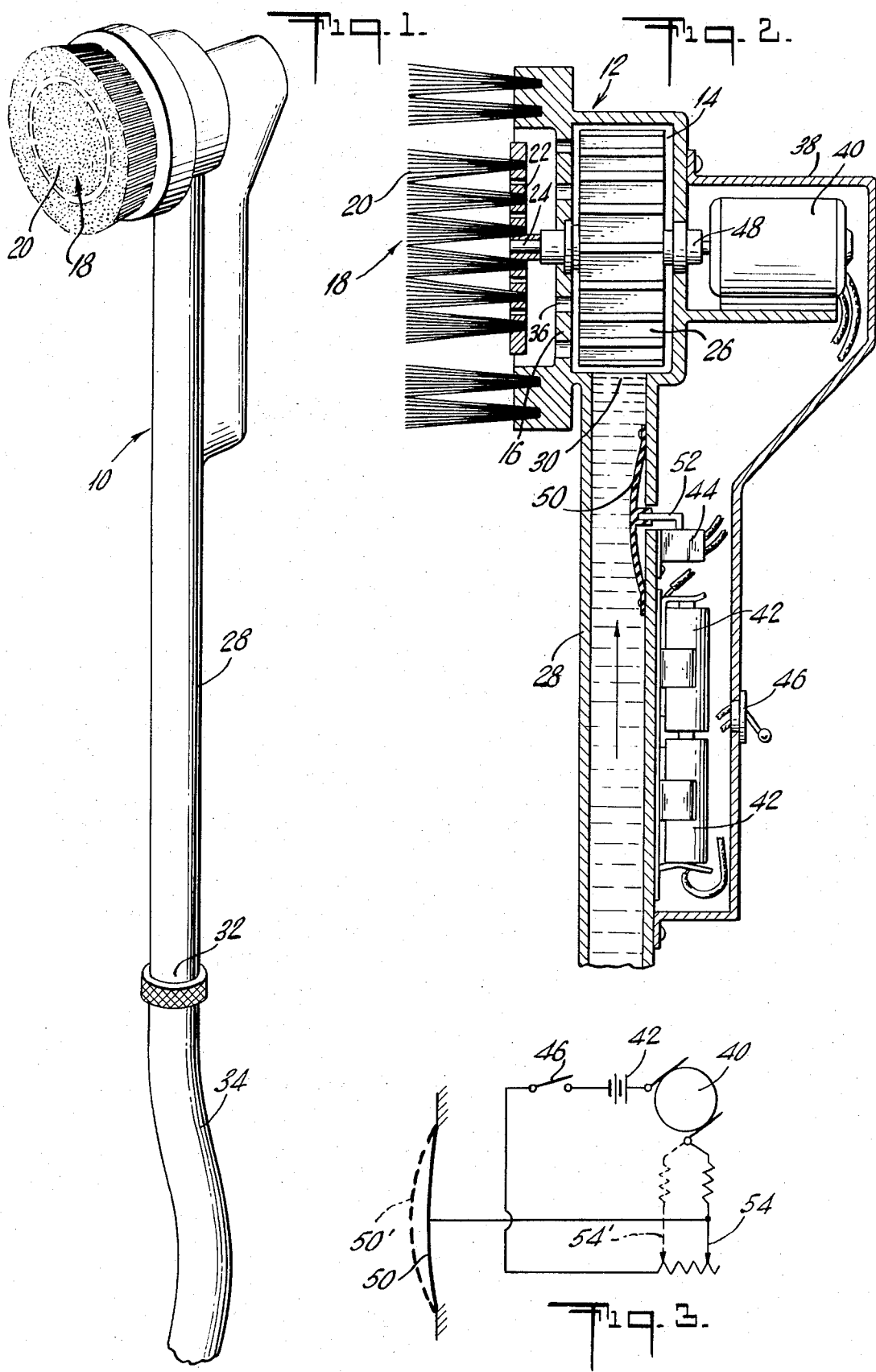


- 2,744,271 5/1956 Florence 15/29

[57] **ABSTRACT**

13 Claims, 3 Drawing Figures





CLEANING BRUSH WITH REVOLVING BRISTLES

FIELD OF THE INVENTION

This invention relates to cleaning brushes, more particularly to cleaning brushes which include bristle-bearing heads which rotate in response to water pressure, and even more particularly to such a cleaning brush which further includes motor means for rotating the bristle-bearing head in response to a decrease of water flow through the brush.

BACKGROUND OF THE INVENTION

In the prior art, it is known to provide a cleaning brush which includes a bristle-bearing head which is rotated to assist in the cleansing operation in response to water flow through the brush. Unfortunately, with this type of brush, when the flow of fluid, such as water, therethrough decreases, the speed of rotation of the bristle-bearing brush also decreases. Even more importantly, in the absence of the availability of a sufficiently high pressure fluid source, the bristle-bearing head does not rotate at all, thereby defeating its purpose.

SUMMARY OF THE INVENTION

The instant invention is directed to a cleaning brush which includes a bristle-bearing head which rotates in response to the flow of fluid through the brush. This is accomplished, like similar devices in the prior art, by causing the fluid to drive an impeller to which the bristle-bearing head is secured.

Unlike the prior art devices, however, the instant invention further includes a motor which is also connected to the bristle-bearing head to rotate same. Fluid responsive control means are provided for energizing the motor means as a function of the fluid flow through the brush. Thus, if the pressure of the fluid flow decreases, the energization of the motor increases such that the rotating bristle-bearing head will have a relatively uniform speed of rotation, independent of the changes in water pressure. Preferably, the fluid responsive control means includes a resilient diaphragm member positioned in the flow path of the fluid passing through the brush and biased toward an initial position in the absence of fluid flow. With increased fluid pressure within the brush, the diaphragm member is displaced to control a potentiometer which controls the energization of the motor as a function of the fluid pressure in the brush. Thus, a decrease in fluid pressure causes an increase in the speed of rotation of the motor, while an increase in water pressure causes a decrease in the energization of the motor. The result is a uniform speed of rotation for the bristle-bearing head, independent of the water pressure. Of course, with no water pressure, the motor is fully excited and provides the only source of energy to rotate the bristle-bearing head. Preferably, the motor is energized by conventional batteries carried on the cleaning brush within a protective enclosure.

In the preferred embodiment, an overriding clutch is employed to connect the motor to the fluid driven impeller. In this manner, rotation of the impeller by the flow of fluid thereabout has no effect upon the shaft of the motor.

Accordingly, it is an object of the invention to provide a cleaning brush which includes a fluid-driven, rotating, bristle-bearing head and which also includes

motor means for rotating the head in inverse proportion to the pressure of fluid flow through the brush.

Other objects of the invention will be most clearly understood by referring to the following specification and drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a perspective view of a cleaning brush constructed in accordance with the teachings of the instant invention.

FIG. 2 is a side elevational view, partly in section, of the brush of FIG. 1.

FIG. 3 is a schematic diagram of the circuitry employed in connection with the instant invention.

DETAILED DESCRIPTION

Turning to the figures, where like numerals are employed to designate corresponding elements, there is shown a cleaning brush 10 constructed in accordance with the teachings of the instant invention. The brush 10 includes a housing 12 having a cavity 14 located therewithin. Rotatably supported in one wall 16 of the housing 12 is a bristle-bearing head 18 comprising a plurality of bristles 20 secured on a disc-like member 22 carried by a shaft 24.

Positioned in the cavity 14 is a fin bearing impeller 26 rigidly secured to the shaft 24 whereby rotation of the impeller 26 causes corresponding rotation of the bristle-bearing head 18.

A conduit 28 communicates at one end 30 thereof with the cavity 14 and at the other end 32 thereof is provided with a conventional collar by which the conduit 28 can be connected to a supply hose 34. It will be appreciated that water supplied from the hose 34 will pass through the conduit 28 and into the cavity 14 to rotate the impeller 26 and drive the head 18. The water leaves the cavity 14 by passing through apertures 36 in the side wall 16 and thence through and around the disc member 22 to be employed in the cleaning process.

Positioned behind the housing 12 is an enclosure 38 which houses a motor 40, batteries 42 and a potentiometer 44, all of which are in a series circuit (FIG. 3) with a switch 46 which protrudes through the wall of the enclosure 38. The motor 40 is connected to the impeller 26 by a conventional overriding clutch 48 which, as is well understood, has the effect of permitting the motor 40 to drive the impeller 26 when the motor 40 is energized, but at the same time effectively disconnects and protects the motor 40 when the impeller 26 is being driven by fluid flow through the brush.

Positioned within the conduit 28 and secured to one wall thereof is a rubber-like diaphragm member 50 naturally biased to assume its initial position illustrated in FIG. 2. A connecting rod 52 connects the diaphragm 50 to the movable arm 54 of the potentiometer 44. It will be appreciated that with no water flowing through the conduit 28, the diaphragm 50 occupies the position shown in FIG. 2.

In operation, and assuming that the operator has closed the switch 46, with no fluid flowing through the conduit 28, the diaphragm 50 occupies the position shown in FIG. 2, and the arm 54 of the potentiometer 44 rests at its leftmost position (identified as 54' in FIG. 3) such that a minimum of resistance is introduced into the circuit, including the motor 40 and the batteries 42

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to maximize the energization thereof. At this point, the head 18 will be driven solely by the motor 40. However, as the water pressure increases within the conduit 28, the diaphragm begins to move from the phantom line position 50' in FIG. 3 toward the solid line position 50 in FIG. 3, and the arm 54 of the potentiometer consequently moves toward the right in FIG. 3. As the arm 54 moves to the right, a greater amount of resistance is introduced into the circuit with a corresponding decrease in current and slowing down of the motor 40. When the arm 54 of the potentiometer moves all the way to the right in FIG. 3, the circuit may be so designed as to introduce sufficient enough resistance to effectively open the circuit and deenergize the motor 40.

Thus, it may be seen, that with the instant invention, the motor 40 is employed to supplement the rotation of the head 18 in inverse proportion to the pressure of the fluid flowing through conduit 28. With greater fluid pressure, there is less rotation derived from the motor 40, and the reverse is also true. In this manner, a balancing is achieved and the head 18 will rotate at a uniform rate regardless of the water pressure and changes therein. Equally as important, without water pressure, the head 18 will be rotated solely by the motor 40.

Although this invention has been described with respect to its preferred embodiments, it should be understood that many variations and modifications will now be obvious to those skilled in the art, and it is preferred, therefore, that the scope of the invention be limited, not by the specific disclosure herein, only by the appended claims.

What is claimed is:

1. A brush comprising a housing; a bristle-bearing head rotatably mounted in said housing; driven means connected to said head for rotating said head in response to fluid flow; motor means connected to said head for rotating said head; and fluid responsive control means for energizing said motor means as a function of fluid flow.
2. The brush of claim 1 wherein said driven means comprises an impeller rotatably mounted in said housing.
3. The brush of claim 2 and further including an over-riding clutch connecting said motor means to said impeller.
4. The brush of claim 3 wherein said fluid responsive control means comprises: movable means positioned in the flow path of said

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fluid for experiencing movement as a function of said fluid flow; and

potentiometer means responsive to the motion of said movable means for increasing energization of said motor means in response to a decrease in fluid flow through said conduit.

5. The brush of claim 4 wherein said movable means comprises a flexible diaphragm member biased to return to an initial condition in the absence of fluid flow.

6. The brush of claim 2 and further including a fluid carrying conduit communicating with said housing, whereby flow of fluid through said conduit and into said housing will rotate said impeller.

7. The brush of claim 6 wherein one wall of said housing rotatably carries said head; said one wall having fluid flow apertures therethrough.

8. The brush of claim 1 and further including an over-riding clutch connecting said motor means to said driven means.

9. The brush of claim 1 and further including a fluid carrying conduit communicating with said housing; whereby flow of fluid through said conduit and into said housing will rotate said driven means.

10. The brush of claim 9 wherein said fluid responsive control means comprises:

movable means positioned in said conduit, said movable means experiencing motion as a function of said fluid flow through said conduit; and

potentiometer means responsive to the motion of said movable means for increasing energization of said motor means in response to a decrease in fluid flow through said conduit.

11. The brush of claim 10 wherein said movable means comprises a flexible diaphragm member secured to a side wall of said conduit and biased to return to an initial condition in the absence of fluid flow through said conduit.

12. The brush of claim 1 wherein said fluid responsive control means comprises:

movable means positioned in the flow path of said fluid for experiencing movement as a function of said fluid flow; and

potentiometer means responsive to the motion of said movable means for increasing energization of said motor means in response to a decrease in fluid flow through said conduit.

13. The brush of claim 12 wherein said movable means comprises a flexible diaphragm member biased to return to an initial condition in the absence of fluid flow.

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