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3,553,758

REVERSIBLE, ROTATABLE BRUSH

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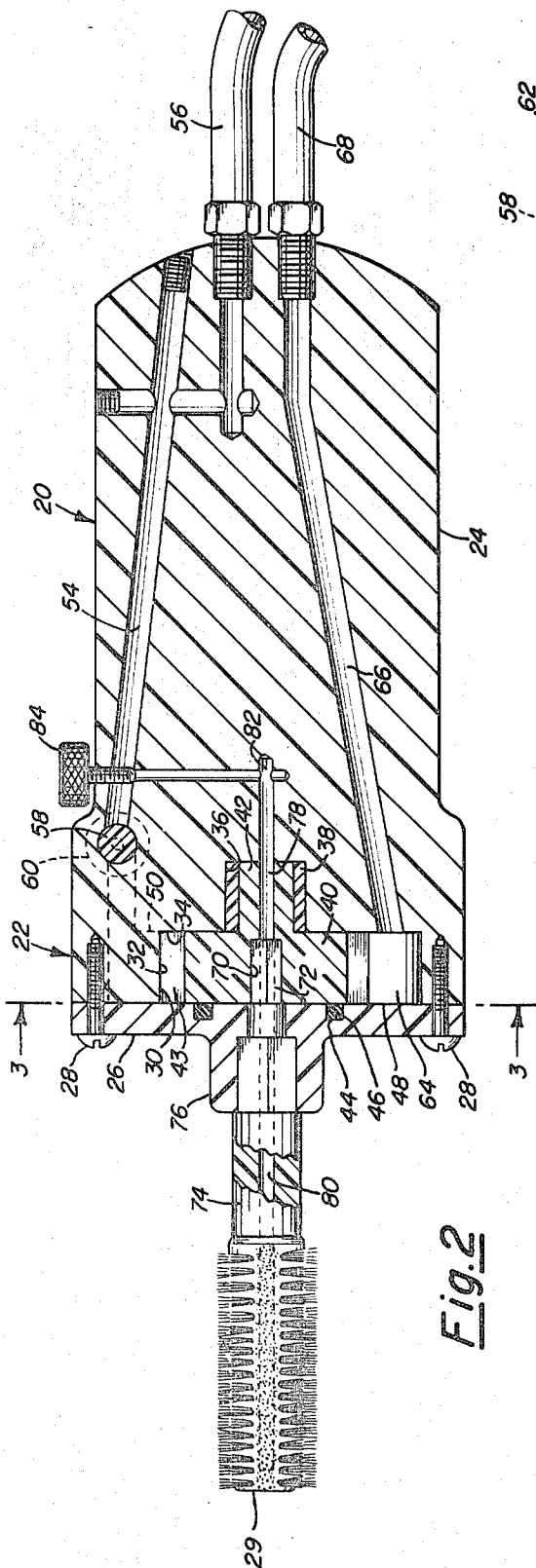


Fig. 2

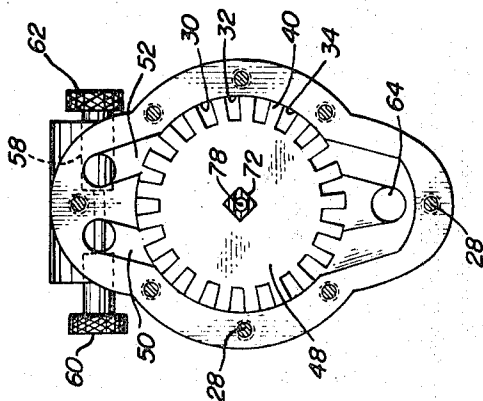


Fig. 3

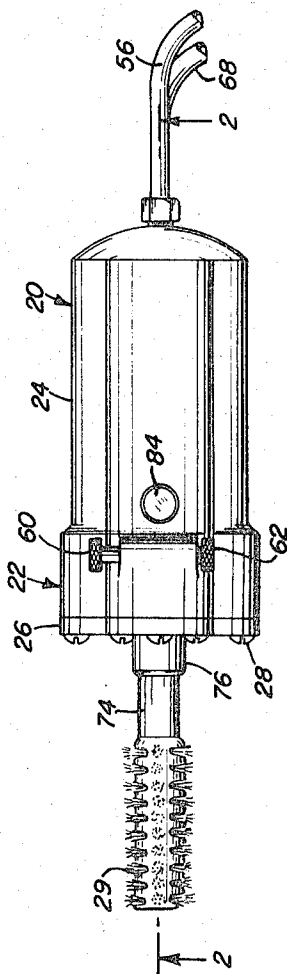


Fig. 1

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REVERSIBLE, ROTATABLE BRUSH

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9 Claims

ABSTRACT OF THE DISCLOSURE

A reversible, rotatable brush employing a casing which functions as a handle and houses a turbine for rotating a brush. The casing is provided with two passages leading to the turbine, one being disposed for causing the turbine to rotate in one direction, and the other being disposed so as to cause the turbine to rotate in the opposite direction. A valve-controlled passage for water is connected with the brush.

BACKGROUND OF THE INVENTION

(1) Field of the invention

A fluid actuated rotatable brush, particularly applicable for cleaning teeth and massaging gums, in which the brush can be rotated in either of two directions.

(2) Description of the prior art

The prior art, such as the patents to Haines No. 3,599,911, Demo et al. No. 2,678,457 and Brucker et al. No. 3,039,123, employ fluid actuated motors for rotating brushes, but do not disclose motors for rotating brushes in opposite directions.

SUMMARY OF THE INVENTION

The brush of the present invention is rotatable in either of two directions. The brush is driven by a turbine having two water inlet passages, one being disposed for directing the water on the turbine vanes for causing it to rotate in one direction and the other being disposed for directing the water on the turbine vanes for causing it to rotate in the opposite direction. The flow of water to the passages is selectively, manually controlled.

A passage for water leads to the brush, the passage extending axially through the turbine. This passage is controlled manually.

Other features and the advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the invention is illustrated.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view of the reversible, rotatable brush showing the same connected with a water main and with a drain by flexible tubes;

FIG. 2 is a longitudinal, sectional view taken along line 2-2 of FIG. 1, but on a larger scale; and

FIG. 3 is a view looking in the direction of line 3-3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The brush 20 includes a casing 22 including a main body 24 and a cover 26 which is held in place by screws 28. Casing 22 forms a handle for manipulating a rotatable brush 29.

As shown in FIG. 2, the left end of the body is circularly recessed as at 30 to provide a cylindrical surface 32 and an axially extending bearing surface 34. The surface 34 is axially recessed at 36 to provide a circular opening for a bearing 38. These recesses receive a turbine 40 hav-

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ing a hollow boss 42 which is journaled in bearing 38. The peripheral ends of the turbine blades 43 extend to the cylindrical surface 32 of the recess 30, and the right side of the turbine bears against the bearing surface 34 of the recess.

The recess 30 is covered by the cover 26, the right side of the cover being provided with a circular groove 44 for receiving an O-ring 46. The groove is disposed axially with the recess 30 and turbine 40 and bears against the left face 48 of the turbine to form a seal. Thus the recess 30 and cover 26 form a chamber for housing the turbine 40.

As is seen more clearly in FIG. 3, the recess or chamber 30 is provided with two inlet passages 50 and 52 disposed so that when water, emanating from passage 50, impinges on the blade 42 of the turbine, it will rotate in a counter-clockwise direction, as viewed in FIG. 3; and when water, emanating from passage 52, impinges on the blades, the turbine will rotate in the opposite direction. These passages 50 and 52 are connected to a common inlet passage 54, which latter is connected by a suitable flexible tube 56 with a source of water under pressure.

A suitable valve 58 is interposed between water inlet passage 54 and the passages 50 and 52. It is moved manually through two knobs 60 and 62. When the valve 58 is in its central position, it closes the ports to passages 50 and 52. When knob 60 is moved to the right, as viewed in FIG. 3, water flows into passage 50; then when the knob 62 is moved to the left, the flow of water ceases to flow to the passage 50, and, upon farther movement of the knob 62 to the left, water flows through passage 52.

The periphery of the recess 30 is provided with a discharge port 64, substantially opposite the outlets of passages 50 and 52, and this port is connected with a drain passage 66 in the main body 24, which passage is connected with a flexible drain tube 68.

The center of the turbine 40 is provided with a square opening 70 for receiving the square shaped inner end 72 of the brush shaft 74 whereby the brush 29 is rotated when the turbine is rotated. The brush shaft 74 is journaled in the hollow boss 76 of the cover 26. The brush and shaft may be held removably in position in any well-known manner.

The turbine boss 42 is provided with a passage 78 which is aligned with the square opening in the turbine and with a passage 80 in the brush shaft 74. This latter passage terminates within the bristles. The passage 78 in boss 42 is connected with a passage 82 in the main body 24, the inlet thereof being connected to either passage 54 or 56 and is herein shown as connected with inlet passage 54. A manually actuated valve 84 controls the flow of water from passage 54 to passage 82, and consequently controls the flow of water to the bristles.

The brush of the present invention is useful particularly for cleaning teeth and massaging gums. The brush 29 can be rotated first in one direction and then in the other direction as the user progressively moves the brush from one side of the interior of the mouth to the other side. Reversible rotation not only provides better cleaning, but also provides speedier cleaning. Too, the supplying of rinsing water while the brush is rotated, first in one direction and then in the other, provides quicker and more thorough rinsing.

While the form of embodiment herein shown and described constitutes preferred form, it is to be understood that other forms may be adopted.

I claim:

1. A brush, comprising in combination:

(A) a turbine having opposite side walls and radially extending vanes leading to the periphery thereof and forming radially extending passages between the

- same, the center of the turbine having a non-circular driving surface;
- (B) a casing for the turbine embracing both side walls of the turbine, said casing forming a handle and having:
- (1) a passage directed to the vanes to rotate the turbine in one direction,
 - (2) an adjacent passage directed to the vanes to rotate the turbine in the opposite direction,
 - (3) a water inlet duct connectible with a source of water under pressure and connected to said passages,
 - (4) a water outlet duct connected with the turbine opposite said passages and connectible with a drain;
- (C) valve means carried by the casing for selectively interconnecting the passages with the water inlet;
- (D) a removable brush having a driving surface which complements the driving surface of the turbine, said surfaces being movable into driving relationship with one another, said brush having:
- (1) bristles,
 - (2) a passage connecting the bristles with one of said ducts;
- (E) a valve for controlling the flow of water to the last mentioned passage.
2. A brush as defined in claim 1, characterized in that the casing (B) includes:
- (5) a main body which is recessed and the turbine is disposed in the recess,
 - (6) a cover for the recess, said brush being carried by the cover.
3. A brush as defined in claim 1, characterized in that the casing (B) includes:
- (5) a main body which is recessed and the turbine is disposed in the recess, said passages and ducts being disposed in the main body,
 - (6) a cover for the recess, said brush being carried by the cover.
4. A brush as defined in claim 1, characterized in that the last mentioned passage (D) (2) extends centrally through the turbine.
5. A brush as defined in claim 4, characterized in that the casing (B) includes:
- (5) a main body which is recessed and the turbine is disposed in the recess,
 - (6) a cover for the recess, said brush being carried by the cover,

6. A brush as defined in claim 4, characterized in that the casing (B) includes:

- (5) a main body which is recessed and the turbine is disposed in the recess, said passages and ducts being disposed in the main body,

- (6) a cover for the recess, said brush being carried by the cover.

7. A brush as defined in claim 4, characterized in that the casing (B) includes:

- (5) a main body which is recessed and the turbine is disposed in the recess, said first and second mentioned passages and ducts being disposed in the main body,

- (6) a cover for the recess, said brush being carried by the cover.

8. A brush as defined in claim 1, characterized in that the casing (B) includes:

- (5) a main body which is recessed and the turbine is disposed in the recess,

- (6) a cover for the recess, said brush being carried by the cover.

9. A brush as defined in claim 1, characterized in that the casing (B) includes:

- (5) a main body which is recessed and the turbine is disposed in the recess, said first and second mentioned passages and ducts being disposed in the main body,

- (6) a cover for the recess, said brush being carried by the cover.

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