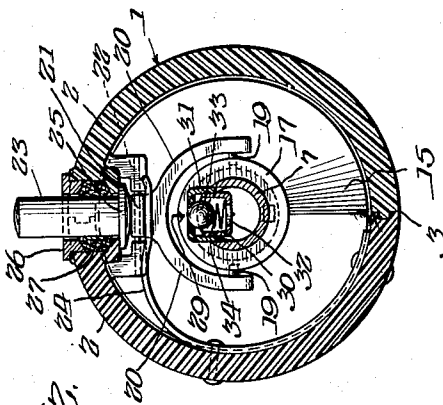
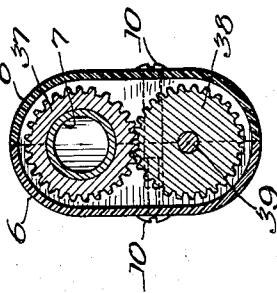
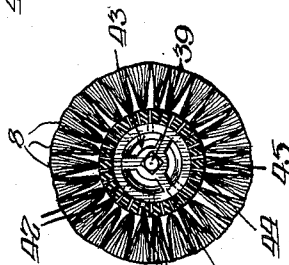
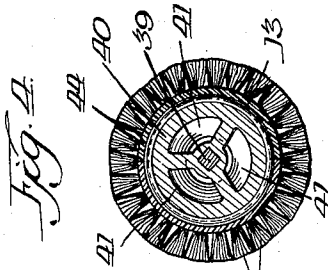
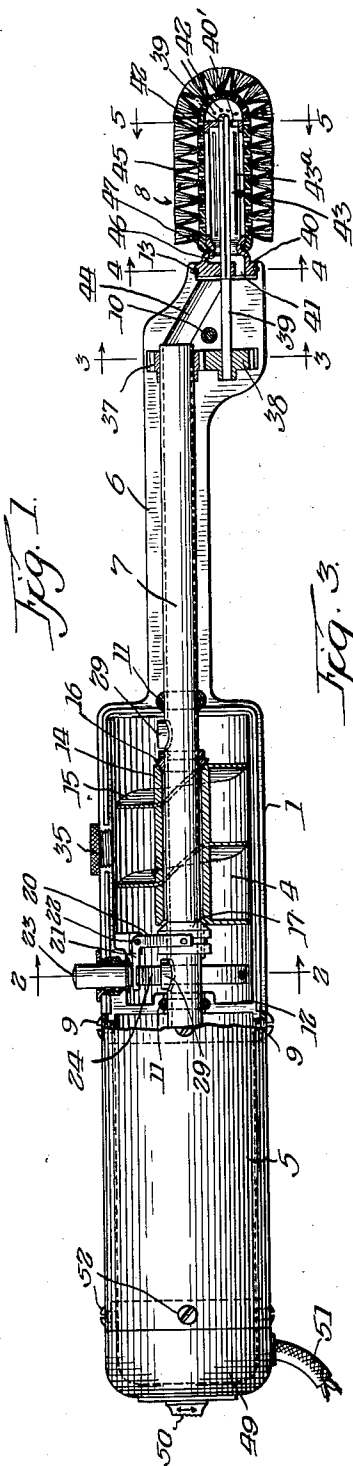


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J. F. CANNON
POWER DRIVEN TOOTHBRUSH
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POWER DRIVEN TOOTHBRUSH

John F. Cannon, Springfield, Ill.

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12 Claims. (Cl. 15-24)

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My invention belongs to that general class of devices known as power driven brushes or the like, and particularly to a compact tooth brush in which a suitable brush may be positioned within the mouth and rotated by means of a fractional horsepower or other motor so as to give a thorough brushing action.

The device has among its objects the production of an appliance of the kind described that is simple, efficient, of light weight, and attractive in appearance, which in operation may be caused to discharge tooth paste or tooth powder to the brush.

The motor is preferably the reversible type which may be reversed to facilitate the brushing of the upper or lower teeth on either side of the mouth. The same is particularly efficient and satisfactory for the cleaning or polishing of artificial teeth.

The invention has among its further objects the novel construction in which the dentifrice such as paste, powder or other cleaning material is fed through the brush driving shaft to the brush, and a novel controlling means for a material feeding device which will enable the device to feed from the magazine containing the material into the shaft when the shaft is being driven in either direction.

A further object is a new and novel means of connecting a suitable brush to the drive shaft.

A further object is the production of a device in which the feeding of the material may be controlled while the motor is running so that the brush in action may be continuous and, if desired, the feeding of material be intermittent, the motor and feeding being under the control of the user so as to control the operation of the device as desired.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end, my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a sectional view through my improved device, the reversible, fractional horsepower motor and control switch therefor not being shown in detail since the same in itself, other than in the combination, forms no part of the invention;

Fig. 2 is a sectional view taken substantially on line 2-2 of Fig. 1;

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Fig. 3 is a sectional view taken substantially on line 3-3 of Fig. 1;

Fig. 4 is a similar section taken on line 4-4 of Fig. 1; and

Fig. 5 is a section taken on line 5-5 of Fig. 1.

All of the figures are on enlarged scales.

Referring particularly to Figs. 1 and 2, the reference character 1 indicates generally a casing or housing serving as the material magazine as well as a portion of the handle. The casing 1 which may be constructed in any suitable manner, as shown consists of the two parts or sections 2-2 divided on a line as indicated at 3, the two being rabbeted together and affording a tight fit. At the interior of the casing is provided a chamber or magazine 4 which contains the material to be fed to the brush hereinafter described.

Arranged at the end of the casing or housing 1 is a motor housing 5 which, as shown, is arranged to slip over the end of the portion 1 and maintain the two sections 2 together, the whole being maintained in assembled relation by screws 9 or the equivalent. The reversible, fractional horsepower motor which is not shown in detail, is arranged within the shell 5.

The casing 1 is provided with an extending portion or shaft housing 6 through which extends a tubular shaft 7 operably connected to the armature shaft of the motor. Arranged at the end of the extending portion 6 is a brush 8 of suitable construction which is operatively connected with the shaft 7 in the manner hereinafter described.

The two parts 6 may be suitably secured together by means of a screw or bolt 10. There are also provided bearings and stuffing boxes 11, one of which is supported by the transverse partition 12 at the motor housing end of the handle portion 1. A split ring 13 sealed in grooves in the brush and extension 6 removably secures the brush to the extension 6.

Arranged on the shaft 7 within the chamber 4 is a sleeve 14 which carries a spiral conveying member 15. One end of the sleeve 14 is arranged to engage with the collar 16 secured on the shaft, while the other end is constructed for engagement with the clutch member 17 which is splined to the shaft and slidable thereon. The clutch member 17 is controlled or operated by means of a bell crank 20-21, the portion 20 being in the form of a yoke as shown in Fig. 2 and provided with lugs 19 engaging in a peripheral groove in the clutch member 17. The clutch is controlled by means of an operating member 23 engaging with the bell crank arm 21, a spring

24 or its equivalent normally maintaining the button 23 out and the clutch disengaged. As shown, a stop 25 is provided at the inner end of the button 23 and a stuffing box 26-27 arranged to prevent leakage along the stem of the button.

There is also provided a valve mechanism controlling the feeding of material into the tubular shaft 7 when the shaft is rotated in either direction. The valve mechanism is indicated generally by the reference character 29 and, as shown in Fig. 2, may consist of a valve housing 30-31 arranged at each of the ports or openings in the shaft. Each housing is provided with an opening 32 and the feeding of the material controlled by a ball valve 33 and spring 34 which normally maintains the valve in its closed position except when the conveyor is moving in a direction to feed material in the direction of the valve. When the feed mechanism is operated in one direction, material may enter the tubular shaft past one of the valves, but material in the shaft cannot flow back into the chamber 4. When the motor is reversed the feeding is past the other valve and the first mentioned valve prevents its discharge back into the chamber 4. An opening normally closed by a plug or closure 35 may be provided in the casing to permit charging of the magazine.

Arranged at the outer end of the portion 6 are the gears 37 and 38, 37 being rigidly secured to the end of the tubular shaft 7, while the gear 38 is rigidly connected with the shaft 39, shaft 39 extending through and into a brush carrying member consisting of a partition 40 and outer end 40' connected by a slotted section 43 having slots or openings 43a therein. As shown, a tubular passage 44 is provided from the end of the tubular shaft 7 to the partition 40 which is in the form of a spider with openings 41 through the same through which the material may flow from the tubular shaft through 44 and into the slotted member 43 mounted on the shaft 39.

While any suitable brush may be employed for the purpose, I have shown the brush consisting of the bristles designated generally as 8 carried by a rubber or like sleeve 45 which may be snapped over the lip 46 with the portion 47 engaging with the lip, retaining the brush in place, and maintaining the parts assembled. When it is desired to change brushes, as for example for different individuals, the brush may be slipped off and a new brush inserted. The sleeve 45 is provided with perforations 42 through which the dentifrice may flow to the bristles.

As was before mentioned, the reversible motor is not shown in detail. The motor housing 5 may be provided with a removable cap 49 so that the motor may be readily positioned within the housing and a reversing switch 50 is arranged at the end of the cap, 51 being the conductors extending to the motor. The parts 5 and 49 may be secured together by screws 52 or their equivalents.

In use material such as dentifrices may be placed in the magazine 4 through the opening normally closed by the plug 35. When the switch is operated to drive the motor the shaft 7 is rotated, the connection between the motor and shaft 7 being either direct or through reduction gears, not shown in detail, thereby rotating the shaft and the brush at the end of the shaft housing 6. With the button 23 as shown, the clutch is released and consequently the shaft is driven without any drive of the conveyor screw or blade 15.

Assuming that the motor is driven in a direction to cause the material to be fed toward the brush, when the button 23 is depressed, clutch member 17 will engage with the sleeve 14, driving the sleeve and blades, moving material toward the brush, and the pressure of the material will force the same past the valve at the brush end and into the tubular shaft and into the brush and out between the bristles. When the button is released the feeding of the material immediately stops. If the motor is reversed the feeding will be in the opposite direction in the housing and the material enter the tubular shaft past the valve at the opposite end. Feeding may be intermittently controlled by operating the clutch control button 23.

It will thus be seen that the brush 8 may be rotated in either direction at will and the material may be fed into the brush at will and intermittently regardless of the direction of rotation of the brush. It will also be seen that it is a simple matter to change brushes. The particular construction of brush has some advantages, an important one being that it is not rigidly secured to the driving member and is more or less flexible or yielding so that danger of injury to the mouth is obviated. While I have not shown a guard partially encircling the brush to prevent contact of the brush with the cheek at the inside of the mouth, such guard may be readily constructed and provided.

While I have particularly referred to the device as a tooth brush, it is obvious that the same may be used wherever found applicable where a brush of this type is desired.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, and a revolvable cylindrical brush secured on the free end of the shaft housing, said brush having a hollow slotted cylindrical wall in communication with said hollow shaft, and there being drive means between the hollow shaft and brush.

2. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a hollow shaft journaled in said casing, a reversing motor in said casing for driving said hollow shaft in either direction, a spiral conveyor mounted on said shaft in said magazine and there being a valve controlled inlet port to said hollow shaft adjacent each end of the spiral conveyor in the magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a revolvable brush secured on the free end of the shaft housing, said brush having a hollow slotted cylindrical wall in communication with said hollow shaft, and drive means between the hollow shaft and brush.

3. A tooth brush comprising a casing providing

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a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said hollow casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, and a revolvable cylindrical brush at the free end of the shaft housing, said brush having a slotted cylindrical wall in communication with the hollow shaft, drive means between the hollow shaft and brush, and means for detachably connecting said brush to the shaft housing.

4. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, and a revolvable brush removably secured on the free end of the shaft housing, said brush having a hollow slotted cylindrical wall in communication with said hollow shaft and there being drive means between the hollow shaft and brush.

5. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a hollow shaft journaled in said casing, a reversing motor in said casing for driving said hollow shaft in either direction, a spiral conveyor mounted on said shaft in said magazine and there being a check valve controlled inlet port to said hollow shaft adjacent each end of the spiral conveyor in the magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, and a revolvable brush removably secured on the free end of the shaft housing, said brush having a hollow slotted cylindrical wall in communication with said hollow shaft.

6. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, and a revolvable brush at the free end of the shaft housing, said brush having a slotted cylindrical wall in communication with the hollow shaft, drive means between the hollow shaft and wall of the brush, and means for detachably connecting said brush to the shaft housing.

7. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, a revolvable brush at the free end of the shaft housing, drive means between the hollow shaft and brush, said brush having a slotted cylindrical wall in communication with said hollow shaft and a perforated bristle holding sleeve removably secured on the slotted cylindrical wall.

8. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing,

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a hollow brush rotating shaft journaled in said casing, a reversing motor for driving said hollow shaft in either direction, a spiral conveyor mounted on said shaft in said magazine and there being a valve controlled inlet port to said hollow shaft adjacent each end of the spiral conveyor through which port the spiral conveyor feeds dentifrice to the hollow shaft, and manually operated clutch means for clutching the spiral conveyor to the hollow shaft.

9. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a hollow shaft journaled in said casing, a reversing motor for driving said hollow shaft in either direction, a hollow brush driven from said hollow shaft, a spiral conveyor mounted on said shaft in said magazine and there being a valve controlled inlet port to said shaft adjacent each end of the spiral conveyor through which port the spiral conveyor feeds dentifrice to the hollow shaft, a clutch collar fast on the hollow shaft and arranged to clutchingly engage one end of the spiral conveyor, a clutch collar splined to the hollow shaft and arranged to clutchingly engage the other end of the spiral conveyor, and clutch actuating means having one member extending out through the wall of the magazine.

10. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in said casing, a spiral conveyor mounted on said shaft in said magazine and there being an inlet port to said hollow shaft in said magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a manually operable clutch means between the hollow shaft and spiral conveyor, a removable revolvable brush at the free end of the shaft housing, drive means between the hollow shaft and brush, said brush having a slotted cylindrical wall in communication with said hollow shaft, and a perforated bristle holding sleeve removably secured on the slotted cylindrical wall.

11. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in the casing, a spiral conveyor mounted on the shaft in said magazine, clutch means for clutching the spiral conveyor to the hollow shaft and there being a port to said hollow shaft in the magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a pinion fast on the free end of said hollow shaft, a second pinion journaled in the shaft housing and meshing with said first mentioned pinion, a shaft secured to said second mentioned pinion and extending out through the end of the shaft housing, a brush having a slotted cylindrical wall secured on said shaft housing and connected to said last named shaft, and there being a duct leading from the free end of the hollow shaft to the interior of the slotted cylindrical wall of the brush.

12. A tooth brush comprising a casing providing a magazine for a dentifrice and a shaft housing, a motor driven hollow shaft journaled in the casing, a spiral conveyor mounted on the shaft in said magazine, clutch means for clutching the spiral conveyor to the hollow shaft and there being a port to said hollow shaft in the magazine through which the spiral conveyor feeds dentifrice to the hollow shaft, a pinion fast on the free end of said hollow shaft, a second pinion journaled in the shaft housing and meshing with said first mentioned pinion, a shaft secured to said second mentioned pinion and extending out

through the end of the shaft housing, a brush having a slotted cylindrical wall removably secured on said shaft housing and removably connected to said last named shaft, and there being a duct leading from the free end of the hollow shaft to the interior of the slotted cylindrical wall of the brush.

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