

March 3, 1959

G. S. TSUDA

2,875,458

ELECTRIC TOOTHBRUSH WITH IMPROVED TOOTHBRUSH HOLDER

Filed Aug. 19, 1955

2 Sheets-Sheet 1

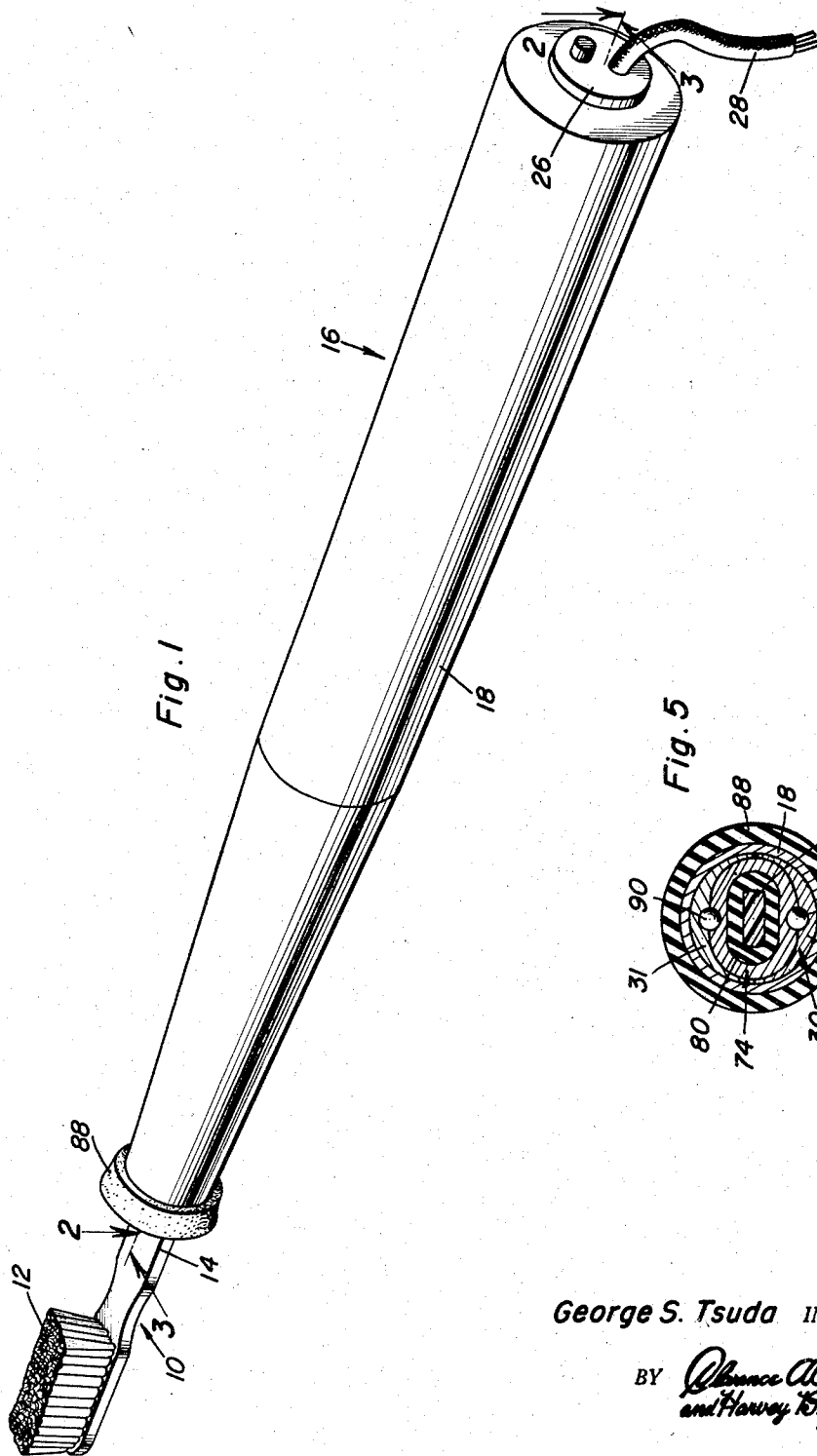


Fig. 1

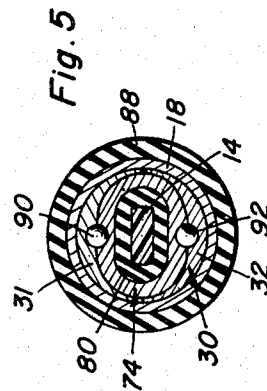


Fig. 5

George S. Tsuda INVENTOR.

BY *Albion A. Brown*
and Harvey R. Jackson
Attorneys

March 3, 1959

G. S. TSUDA

2,875,458

ELECTRIC TOOTHBRUSH WITH IMPROVED TOOTHBRUSH HOLDER

Filed Aug. 19, 1955

2 Sheets-Sheet 2

Fig. 2

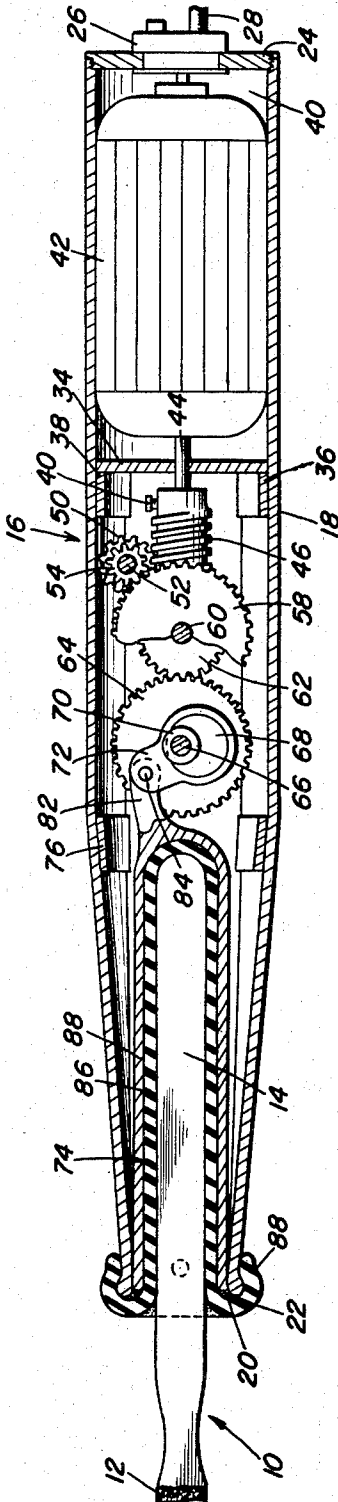


Fig. 4

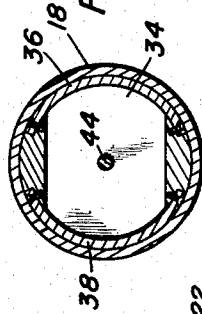
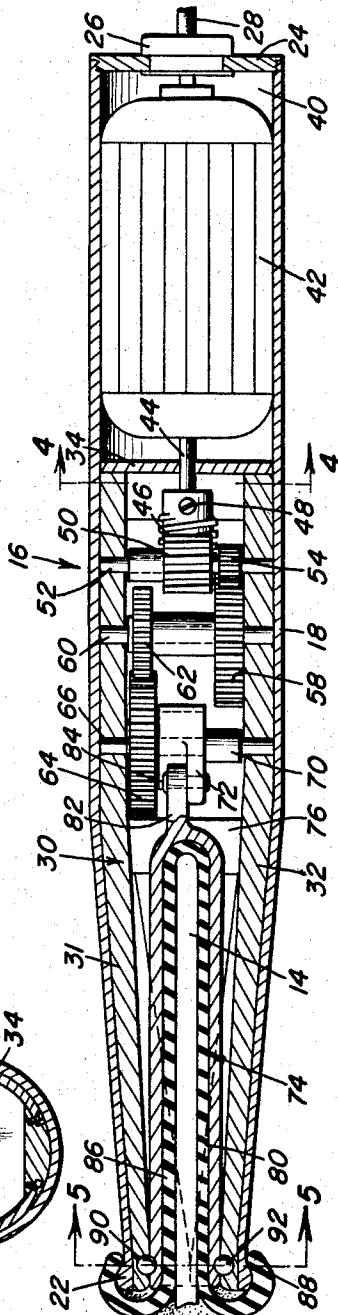


Fig. 3



George S. Tsuda

INVENTOR.

BY *Chance A. Olson*
and *Harvey B. Jacobson*
Attorneys

1

2,875,458

ELECTRIC TOOTHBRUSH WITH IMPROVED TOOTHBRUSH HOLDER

George S. Tsuda, Hilo, Territory of Hawaii

Application August 19, 1955, Serial No. 529,473

5 Claims. (Cl. 15—22)

This invention relates to power operated implements, and particularly to an electrically actuated toothbrush.

An object of this invention is to provide a device which holds a conventional toothbrush and in response to closing of a switch, oscillates the same in a manner to properly brush the teeth of an individual user of the invention.

A further object of this invention is to provide a toothbrush actuating device with improved means for retaining the toothbrush so that it may be readily removed and replaced.

A further object of this invention is to provide a device for actuating a toothbrush, the device being slender and holding the toothbrush so that its longitudinal axis is in alignment with the longitudinal axis of the holder whereby the device is easily held in the hand while it is being used.

A further object of this invention is to provide an electrically operated toothbrush of the general type where the toothbrush is held and oscillated by an electric motor, the present device being of extremely simplified form and using a gearing arrangement for oscillating the toothbrush, which is silent and smooth in its power transmitting function.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the device;

Figure 2 is a longitudinal sectional view of the device in Figure 1 and taken generally on the plane of line 2—2 of Figure 1 and in the direction of the arrows;

Figure 3 is a longitudinal sectional view taken generally on the line 3—3 of Figure 1 and in the direction of the arrows;

Figure 4 is a transverse sectional view taken substantially on the line 4—4 of Figure 3 and in the direction of the arrows; and

Figure 5 is a transverse sectional view taken substantially on the line 5—5 of Figure 3 and in the direction of the arrows.

In the accompanying drawings, there is illustrated a conventional toothbrush 10 which includes a bristle section 12 together with a handle 14. This toothbrush is releasably carried by the toothbrush holding and oscillating device 15 by means which are described herein subsequently.

The toothbrush holding and oscillating device 16 comprises a casing 18 which is elongated so as to be easily gripped in the hand. It has an open end 20 with a bead 22 therearound, together with an end closed by plate 24. Plate 24 has an opening in it accommodating manually operated switch 26 in which line cord 28 terminates.

A frame 30 is disposed in casing 18 and is adapted to support the power transmission and toothbrush handle

2

holding means. Frame 30 consists of a pair of frame members 31 and 32 held assembled at one end by means of an end plate 34 having flanges 36 and 38 extending therefrom and recessed in notches formed in the frame members 31 and 32, as shown in Figure 4. Flanges 36 and 38 are arcuate in form, fitting flush against the inner surface of casing 18. The frame members are tapered toward each other as they approach the open end 20 of case 18 and they have feathered confronting edges (Figure 5).

In the compartment 40 defined by plates 34 and 24, there is a motor 42. This motor is electrically connected to the switch 26 for energization from line cord 28. The shaft 44 of the motor extends through an opening in the plate 34 and has a worm 46 secured to it, as by a set screw 48 or the like. This worm is enmeshed with a gear 50 that is fixed to shaft 52, the latter being mounted for rotation in aligned openings in the frame members 31 and 32. Pinion 54 is also fixed to the shaft 52 and is enmeshed with a gear 58 disposed on shaft 60, the latter being mounted in aligned openings in the frame members 31 and 32. Gear 58 is a part of a cluster whose other gear 62 is enmeshed with gear 64 that is fixed to shaft 66. This shaft is carried by frame members 31 and 32 and has an eccentric 68 whose collar 70 is fixed to shaft 66 by means of a set screw or the like. A crank 72 has an opening in it wherein the eccentric 68 is disposed. It is understood that in lieu of fastening the eccentric and gear 64 to the shaft 66, they may be made like the cluster 58—62, that is, as one piece and mounted for free rotation on shaft 66. The same is true of gear 50 and pinion 54.

When the motor 42 is energized, the shaft 44 rotates, thereby driving the pinion 54 through the worm 46 and gear 50. Actuation of the pinion 54 rotates the gear 58 of its cluster, thereby driving the gear 62 and actuating gear 64. Rotation of gear 64 means that the eccentric 68 will rotate, thereby oscillating the crank 72.

A toothbrush handle holder 74 is disposed in the frame 30 and has its inner end located adjacent the intermediate support collar 76 having portions notched in the frame members 31 and 32 as the flanges 36 and 38 are notched therein. This holds the frame members as a unified, rigid structure.

Toothbrush handle holder 74 is in the form of a rod having a longitudinal cavity 80 and an end 82 connected by crank pin 84 to the crank 72. Accordingly, the holder 74 will be oscillated in response to rotation of the eccentric 68 to which the crank 72 is operatively connected. Cavity 80 has a resilient liner 86, made of rubber or like material, disposed in it, the function of the liner being to frictionally contact and hold the toothbrush handle 14. The outer end of the liner is returned, as at 88, over the outer edge, and bead 22 of the case 18 to form a water seal by excluding water from entering between frame member 32 and holder 74.

In operation, the switch 26 is closed in order to energize the motor. As the motor is energized, the toothbrush holder 74 is oscillated, due to the actuation of crank 72 through the power transmission described previously. In order to control the oscillation of holder 74, there are bearings 90 and 92 located in wells formed in the confronting surfaces of frame members 31 and 32 and in the outer surfaces of the holder 74 near the outer end thereof. It is preferred that these bearings be balls in order to allow the toothbrush holder to oscillate freely within reasonable limits.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and de-

3

scribed, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A device for holding and oscillating a toothbrush which has a handle, said device comprising an elongate casing having an open end, an elongated toothbrush handle holder in said elongate casing, means supporting one end of said elongate holder adjacent to said open end of said casing for oscillatory movement, said holder having an elongated cavity opening to an end of the holder, an elongate resilient liner in said holder cavity and having an open end at said open ends of said holder and said casing respectively and within which the toothbrush handle is adapted to be frictionally gripped when the outer end of said handle is inserted in said open end of said holder liner with the frictional gripping forming the sole means of retaining the toothbrush handle in said holder, a motor in said casing, and mechanical means in said casing and drivingly connected to said motor and said elongate holder to oscillate said holder in response to actuation of said motor.

2. A device for holding and oscillating a toothbrush which has a handle comprising an elongated casing having a longitudinal axis in general longitudinal alignment with the handle of the toothbrush and an open end, a motor in said casing, a toothbrush holder mounted for oscillatory movement in said casing and holding said toothbrush handle, a transmission drivingly connecting said holder with said motor, resilient means in said holder forming a seal by having a part embracing said open end of said casing and retaining said toothbrush handle releasably therein, said transmission and holder being connected together as a unit, a frame supporting said holder and said transmission and insertable in said casing, and means pivotally connecting said toothbrush holder to said frame.

3. A toothbrush holder and oscillating device comprising a casing having an open end, a toothbrush holder in the open end of said casing and including a rod hav-

4

ing an elongated cavity therein to accommodate the handle of the toothbrush, a resilient liner disposed in said cavity and frictionally contacting said handle and forming the sole means to releasably hold the toothbrush, a crank connected with said holder, and means in said casing for oscillating said crank in order to oscillate said holder, a frame in said casing to which said crank oscillating means are attached, said liner having a returned end over said casing open end, and means carried by said holder and said frame for pivotally supporting said holder so that it is capable of oscillatory motion.

4. In a toothbrush holder and oscillating device wherein the toothbrush has an elongated handle, a casing having an open end, a toothbrush holder in said casing and having a toothbrush handle entrance registered with said open end of said casing, means in said casing for oscillating said toothbrush holder, said toothbrush holder including a member having a cavity which opens toward said open end of said casing, a resilient liner in said cavity extending completely to the bottom thereof and over the edge of said member, said liner having a part which overlies the open end of said casing in order to form a water seal thereover.

5. The combination of claim 4 wherein said liner forms the sole means to support the toothbrush handle whereby the handle is completely resiliently mounted, and means near said open end of said casing and contacting said member for mounting said holder for oscillation.

References Cited in the file of this patent

UNITED STATES PATENTS

1,734,281	Wagner	Nov. 5, 1929
1,832,519	Wheat et al.	Nov. 17, 1931
1,993,763	Touchstone	Mar. 12, 1935
2,095,956	Bess	Oct. 19, 1937
2,319,205	Buck	May 18, 1943
2,644,972	Ubel	July 14, 1953
2,648,787	Smithson	Aug. 11, 1953
2,709,227	Foley et al.	May 24, 1955