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ELECTRIC TOOTHBRUSH

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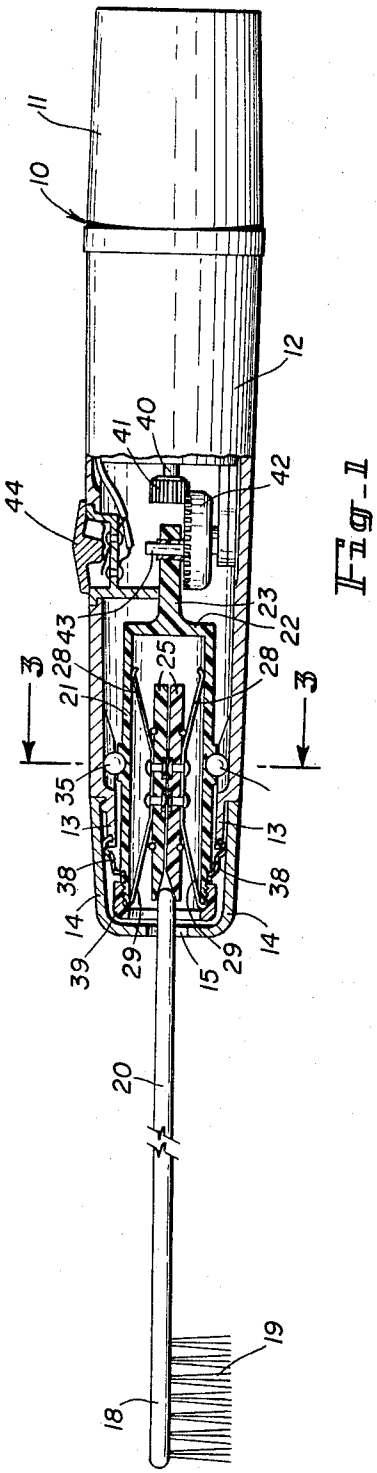

Fig. 1

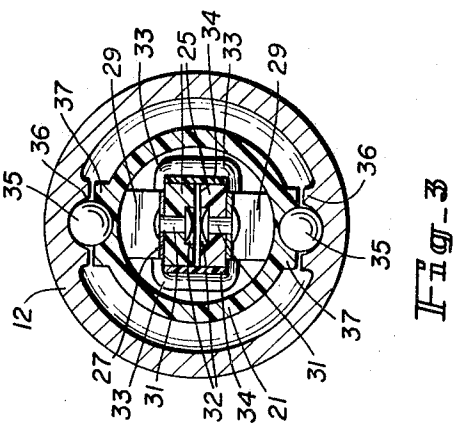

Fig. 3

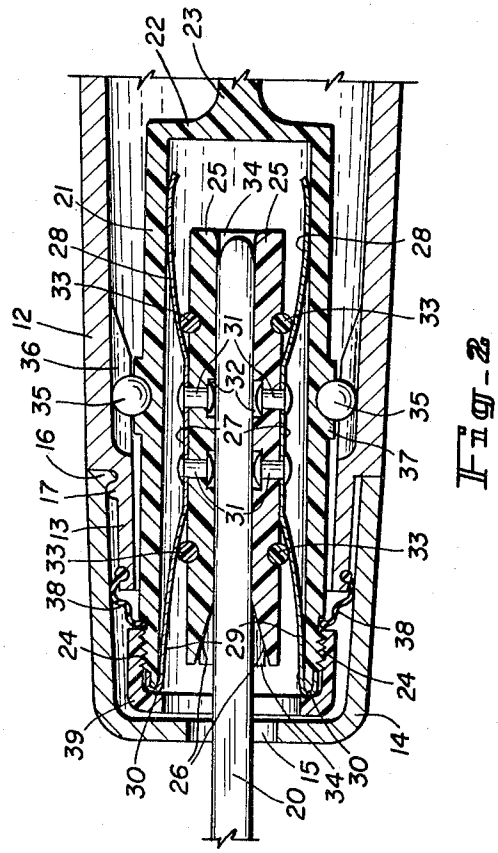

Fig. 2

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ELECTRIC TOOTHBRUSH

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This invention relates to electric toothbrushes and more particularly to the brush handle holder which is part of the portable power actuated unit for a toothbrush or the like.

The main object of the invention is to provide a holder into which the handle of a toothbrush or the like can be inserted by a simple pushing motion and withdrawn by merely pulling the brush handle out of the holder without manipulation of any of the holder parts.

Another object is to provide a holder which is self-adjustable to receive brush handles of different sizes and shapes and to retain the handles by friction.

Another object is to provide a brush handle holder and means for mounting it in a portable power actuated unit in such manner that moisture is prevented from entering the unit between the holder and the unit casing.

The objects and advantages of the invention will be apparent from the drawings and following description.

In the drawings:

FIG. 1 is a longitudinal vertical sectional view, partly in elevation, of a portable power actuated unit for a toothbrush or the like embodying my invention.

FIG. 2 is a longitudinal vertical sectional view, on an enlarged scale, of the brush handle holder and part of the housing in which it is mounted.

FIG. 3 is a transverse vertical sectional view, on an enlarged scale, in the plane of the line 3—3 of FIG. 1.

In that embodiment of the invention shown in the drawings, the power actuated unit **10** comprises a generally cylindrical casing consisting of an end member **11**, intermediate portion **12** having a reduced diameter forward end **13**, and a front end casing **14** provided with a central opening **15**. The reduced diameter end portion **13** of the the casing **12** is slightly smaller in external diameter than the internal diameter of the front end casing **14** which is retained on the part **13** by a flange **16** engaged in the groove formed by the projection **17** on the member **13** adjacent its junction with the casing **12**.

A conventional toothbrush, shown in FIG. 1, comprises the bristle mounting **18**, bristles **19** and handle **20**.

The holder for receiving and frictionally holding the brush handle **20** comprises a holder housing **21** cylindrical in form with closed end **22** provided with an apertured tongue **23**, the opposite end being open and provided with external screw threads **24** or other means for holding brush handle clamping means adjacent said open end. Brush handle clamping means located in the holder housing **21** comprises a pair of clamping bars **25** generally rectangular in cross section, their proximate surfaces being parallel to each other and nearly contacting as shown in FIGS. 1 and 3 when not spaced apart by insertion of a brush handle. The forward ends of the proximate faces of the clamping bars **25** are beveled as indicated at **26** to facilitate placement of a handle **20** between the bars. Preferably the housing **21** and clamping bars **25** are made of plastic materials, such for example, as "Delrin."

Each clamping bar **25** has attached to its outer side surface a leaf spring **27** having a flat central portion provided with two apertures, a rearward free end **28** and a forward portion **29** with end hook **30**. Each spring **27** is attached to a clamping bar **25** by two rivets **31** countersunk at **32** on the proximate sides of the clamping bars **25**. The free ends **28** and **30** of the springs **27** are biased to extend outwardly from the flat portion **27** in divergent directions. The two units are held together by an O-ring **33** located in grooves formed in the outer faces of the clamping bars. Two flat pieces of plastic material **34**, as long as the bars **25** and as wide as the thickness of the two bars **25** contacting each other, are placed adjacent opposite side edges of the bars to keep them in line. These flat pieces **34** are also held in place by the O-rings **33**. The outer surfaces of the parts **28** of the springs **27** bear against the inner surfaces of the holder housing **21** to urge the clamping bars **25** toward each other. The parts **29** likewise bear on the inner surfaces of the holder housing **21** to urge the bars **25** toward each other, and the hook ends **30** extend over and engage notches in the open end edge of the housing **21** adjacent the screw threads **24**.

After the clamping bars **25** with attached springs **27**, side pieces **34** and O-rings **33** have been assembled and placed in the holder housing **21**, the assembly is placed in the casing **12** and mounted therein by the following described means: ball bearings **35** in grooves formed in buttress **36** on the casing **12** and buttress **37** on housing **21**; and a sealing sleeve **38** of flexible or other suitable material shaped to engage the forward end edge of the member **13** of casing **12** and to extend over the space between the member **13** and the holder housing **21**. After mounting said parts in the casing **12**, a cap **39** is screwed on the threads **24**, or snapped on, thereby clamping the sleeve **38** between the cap **39** and holder housing **21**. Finally the front end casing **14** is snapped into place on the casing **12–13**.

The holder housing **21** and contents are given an 80/1000″ orbital reciprocatory movement by any suitable means, such as the mechanism shown which comprises a rotated shaft **40**, pinion **41**, gear **42** with eccentric shaft **43** which extends through the round hole in the tongue **23**. The shaft **40** may be driven by a motor (not shown). A switch **44** controls the motor.

The brush handle **20** can be inserted between the clamping bars **25** with the bristles facing in one direction or in the opposite direction. The clamping bars automatically return to the position shown in FIG. 1 when the brush handle is withdrawn. Moisture cannot enter between the outer casing and the brush holder housing. The construction of the housing **21** and clamping assembly is such that moisture which may enter therein is harmless and readily eliminated.

Changes may be made in details of construction and in the form and arrangement of parts without departing from the scope of the invention as defined by the appended claims.

I claim:

1. An electric toothbrush provided with brush handle holding means in which the brush handle is retained by frictional engagement and is inserted and removed by simple push and pull movements without manipulation of any parts, comprising

(a) a casing,

(b) a brush holder housing having an opening in its forward end mounted in the casing,

(c) a pair of separate substantially parallel brush holder bars extending longitudinally of the housing in alignment with the opening,

(d) resilient means between each bar and the holder housing yieldingly urging said bars toward each other, said resilient means comprising an elongated leaf spring extending longitudinally of the bar and means fastening the spring to the bar between the spring ends, the opposite ends of the spring being biased to extend in divergent directions away from the bar and to bear against the housing surface,

(e) a motor in the casing, and

(f) means operatively connecting the brush holder housing to the motor for reciprocating the housing,

(g) said bars being separable by insertion of a toothbrush handle between said holder bars into frictional engagement therewith.

2. The toothbrush defined by claim 1, in which the forward ends of the springs are hook form and engage the forward ends of the holder housing.

3. The toothbrush defined by claim 1, which includes an O-ring surrounding said bars, said fastening means being a pair of rivets countersunk on the side of the bar facing the other bar.

4. A portable power unit provided with tool holding means comprising

(a) a casing,

(b) a tool shank holder housing having an opening in its forward end mounted in the casing,

(c) a pair of separate substantially parallel tool holder bars extending longitudinally of the housing in alignment with the opening,

(d) resilient means between each bar and the holder housing yieldingly urging said bars toward each other,

(d–1) said resilient means comprising an elongated leaf spring extending longitudinally of the bar and means fastening the spring to the bar between the spring ends, the opposite ends of the spring being biased to extend in divergent directions away from the bar and to bear against the housing surface, the forward ends of the springs being hook shaped for engagement with a fixed part of the holder housing to thereby prevent longitudinal movement of the bars,

(e) a motor, and

(f) means connecting the rear end of the holder housing to the motor for reciprocating the housing,

(g) said bars being separable by insertion of a tool shank between said holder bars into frictional engagement therewith.

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