This invention relates generally to toothbrushes and particularly to an improved powered rotary toothbrush.

Dentists and others responsible for the care and repair of teeth long have advocated the desirability of a rotary type of toothbrush whose direction of rotation can be reversed so that toothbrushing will at all times be done away from the gums, since it is well known that toothbrushing in this fashion will be a great aid in dental care and will result in much healthier teeth, gums and the like.

A number of powered rotary toothbrushes have been advanced in the past but the majority of these have not proven satisfactory for general public use and acceptance. One of the difficulties encountered has been the provision of the motor for the rotation of the toothbrush in the handle and, apart from the fact that this provides an unwieldy implement, the presence of the electric motor close to the operating toothbrush has led to such devices being refused authorization under electrical safety codes.

In other types of toothbrushes wherein the motor is separate from the toothbrush, there is required some form of mechanical or electrical arrangement controlled from the toothbrush to reverse the electric motor and such devices have been needlessly complicated and therefore expensive.

It is an object of this invention to provide an improved rotary toothbrush constructed from a minimum of parts and not requiring any mechanism for reversing the rotation of the toothbrushes.

A further object is to provide a powered rotary toothbrush wherein the toothbrushes are rotating simultaneously in opposite directions.

Additional objects and advantages of my improved construction will be obvious when the following specification is read in the light of the attached drawings.

In the drawings illustrating a preferred embodiment:

FIGURE 1 is a top plan view partly in section illustrating the interconnection of my toothbrush with the drive shafts and drive cable, and illustrating the hand piece and guard in dotted lines.

FIGURE 2 is a diagrammatic end view illustrating the intermeshing of the toothbrush bristles.

FIGURE 3 is a side elevation in section of my assembled toothbrush.

FIGURE 4 is a projected view of the top of my hand piece.

FIGURE 5 is a projected view of the bottom of the hand piece.

FIGURE 6 is a broken away projected view illustrating the guard and the attachment fingers.

My improved toothbrush comprises the hand piece constructed from upper and lower sections 1 and 2 which are identical in construction and are each formed with channels 3 and slots 4 to receive the end of the drive cable and additional channels 5, 6 and 7 and slots 8 to receive the intermeshed gearing and toothbrush shafts also described later in the specification. In addition, each of the sections 1 and 2 is each formed with a peripheral indentation 9 which co-acts to form a peripheral groove when the sections 1 and 2 are secured together by suitable holding screws through the openings 10.

The mechanism within the hand piece consists of the intermeshed gears 11 and 12 which rotate within the slots 8 with the gear 11 supported rotatably by the stub axes 13 and 14 in the grooves 5 and 6 and the gear 12 by the stub axes 15 and 16 in the grooves 5a and 6a. While I have not shown any bearings on the stub axes 13, 14, 15 and 16, it will be obvious that such bearings could be provided for smooth operation if necessary. However, I have found that the hand piece can be constructed of suitable plastic with the axes 13, 14, 15 and 16 of other plastic material that will rotate freely in the grooves, 5, 6, 5a and 6a without frictional wear.

Rotation of the intermeshed gears 11 and 12 is accomplished through the flexible drive cable 17 secured in and rotating within the cable end housing 18 and interconnected with the axle 14 of the gear 11 by a common squared end 19 fitting in the squared opening in the axle 14. To prevent withdrawal of the drive cable 17, the cable end housing 18 is secured within the hand piece by the collar 20 lodged in the groove 4. Interconnected in this manner, it will be obvious that the flexible drive cable 17 could be connected to a suitable power source located remotely from the toothbrush and rotation of the drive cable would simultaneously rotate the intermeshed gears 11 and 12 in opposite directions.

The actual toothbrushing assembly comprises the guard referred to generally at 21 and consisting of the head 22, neck 23 and flexible fingers 24 and 25. The toothbrushes 26 and 27 are each mounted adjacent the forward ends 32 and 33 of identical shafts 28 and 29 fitted rotatably through the neck 28. The shafts 28 and 29 are squared at their rearward ends 30 and 31 for interconnection with the shafts 13 and 15 and are pointed at their forward ends 32 and 33 for engagement with the head 22.

Securement of the guard 21 with the hand piece is accomplished by the fingers 24 and 25 which seat within the groove formed by the indentations 9 of the sections 1 and 2 and lock the guard 21 securely therein by means of the inturnd ends 34 and 35 on the fingers.

Assembled substantially as illustrated and described and with the flexible drive cable 17 connected to a suitable power source, it will be obvious that operation of the power source will result in simultaneous opposite rotation of the toothbrushes 26 and 27. Thereafter, the device may be inserted into the mouth of a user and with the device inserted from one side, the upper rotating brush may be used to brush the upper teeth, with the lower brush brushing the lower teeth in the correct direction. Thereafter, the instrument need only be rotated to place the former upper brush in the lower position and rotation of the brushes automatically will be correct for brushing teeth on the opposite side of the mouth.

What I claim as my invention is:

1. In an improved hand piece and tooth brush assembly for a powered rotary tooth brush having a remote power source and a flexible drive cable, a hand piece comprising upper and lower sections each formed with a peripheral ledge and adapted to be fitted together in opposed relationship to provide a peripheral groove therearound, a bristle guard having a pair of spaced resilient gripping fingers adapted to seat in the said peripheral groove to lock the guard and hand piece together, a pair of shafts mounted rotatably at one of their ends in the
said hand piece and having bristles fixed at their opposite ends to lie within the said guard, a connection at the opposite end of the said hand piece to receive the said flexible drive cable and means within the hand piece interconnecting the flexible drive cable with the said shafts to rotate the shafts simultaneously in opposite directions.

2. The improved hand piece and tooth brush assembly as claimed in claim 1, wherein the pair of tooth brushes mounted rotatably in the said guard have intermeshed bristles.

References Cited in the file of this patent

UNITED STATES PATENTS

1,410,074 Ott ---------------- Mar. 21, 1922
2,655,675 Grover ---------------- Oct. 20, 1953
2,739,327 Blair ---------------- Mar. 27, 1956