Dec. 5, 1950 D. P. GROVER 2,533,108

ROTARY TOOTHBRUSH WITH LIP GUARD

Filed Aug. 22, 1946

Fig. 1

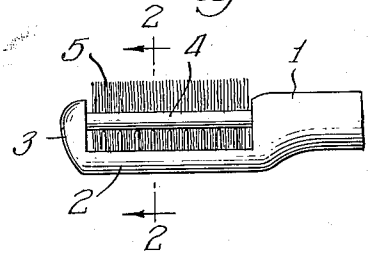


Fig. 2

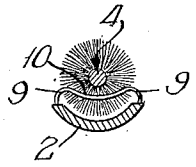


Fig. 3

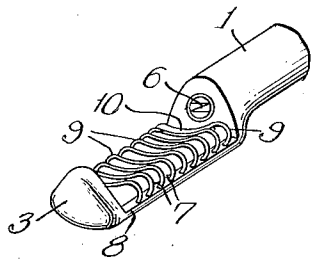


Fig. 4

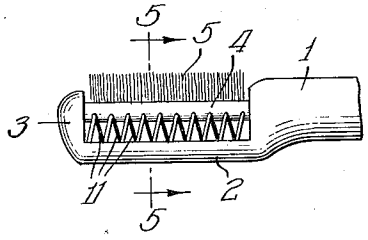


Fig. 5

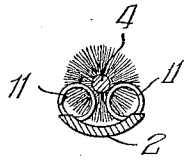


Fig. 6

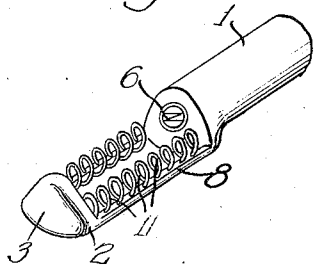


Fig. 7

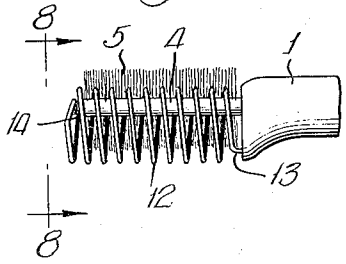


Fig. 8

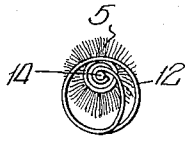
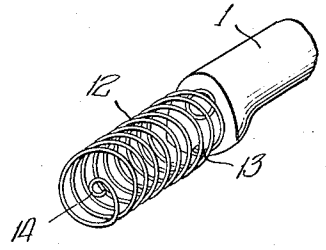


Fig. 9



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ROTARY TOOTHBRUSH WITH LIP GUARD

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Application August 22, 1946, Serial No. 692,270

3 Claims. (Cl. 15—23)

1

This invention relates in general to rotary toothbrushes and in particular to a type of rotary toothbrush adapted for personal use, as distinguished from those commonly used by dentists. The invention as disclosed herein comprises further modified forms of the invention disclosed in a division of my co-pending application filed August 17, 1946, and bearing Ser. No. 691,273.

Various forms of electrically driven rotary toothbrushes have been developed heretofore, but have found very little favor with the public in general. One of the disadvantages of the early type of rotary toothbrush was the absence of any shield partially surrounding the brush element, thus causing some of the toothpaste on the brush to be thrown off and splattered about during the rotation of the brush and permitting the brush to contact the soft inner portions of the mouth causing irritation thereof.

A later development introduced a shield which extended lengthwise of and partially surrounded the rotating brush element to prevent such splattering and mouth irritation. However, actual usage of this type of brush proved unsatisfactory because of the tendency of the lip of the user to be drawn inwardly against the bristles of the brush and between the bristles and the edge of the shield when the brush was placed against the teeth.

I have been able to overcome the disadvantages of these earlier types of rotary toothbrushes in my present invention, the principal object of which is to provide an electrically driven rotary toothbrush having novel guard means to prevent the lip of the user from being pulled or drawn inwardly against the bristles of the brush element during rotation thereof.

Another object of the invention is to provide a rotary toothbrush having a plurality of spaced guards along the length of the brush element and extending between the bristles thereon whereby the lip of the user is prevented from being pulled or drawn inwardly against the brush during rotation thereof.

A further object is to provide a rotary toothbrush wherein lip guards in the form of thin wire members are located adjacent the brush element to thereby prevent the lip of the user from being drawn inwardly thereagainst.

Still another object is to provide a rotary toothbrush wherein a series of coiled wire members is spaced throughout the length of the brush element adjacent thereto whereby the lip of a user is prevented from being drawn inwardly against the brush.

2

A still further and more specific object is to provide a rotary toothbrush having a shield extending lengthwise of and partially surrounding the brush element wherein a series of wire coils are spaced apart along the edges of the shield and adjacent the brush element to thus form a lip guard.

Still another and specific object is to provide a rotary toothbrush having a shield extending lengthwise of and partially surrounding the brush element wherein a plurality of lip guards in the form of thin wires are supported between the edges of the shield and which are bent downwardly between the ends thereof to pass below the spindle of the brush element.

A still further object is to provide a lip guard for a rotary toothbrush which consists of a single coil of wire extending lengthwise of the brush element and having one end thereof secured to the handle portion whereby the outer edges of the coiled wire will prevent the lip of a user from being drawn inwardly against the brush.

Other objects and advantages of the invention will become apparent upon a reading of the following description taken in conjunction with the accompanying drawing in which:

Fig. 1 is a fragmentary side elevation of a rotary toothbrush embodying one form of lip guard;

Fig. 2 is a vertical transverse section taken substantially along the plane of line 2—2 of Fig. 1;

Fig. 3 is a fragmentary perspective view of the forward end of the handle portion showing the wire lip guards extending across and between the edges of the shield;

Fig. 4 is a fragmentary side elevation similar to Fig. 1 but showing a modified form of lip guard;

Fig. 5 is a vertical transverse section taken substantially along the plane of line 5—5 of Fig. 4;

Fig. 6 is a fragmentary perspective view of that portion of the device shown in Fig. 4;

Fig. 7 is a fragmentary side elevation similar to Figs. 1 and 4 but showing a still further modified form of lip guard;

Fig. 8 is an end elevation taken substantially along the plane of line 8—8 of Fig. 7; and

Fig. 9 is a fragmentary perspective view of that form of the invention shown in Fig. 7.

Briefly described, the invention herein consists primarily in the provision of guard means against which the lip of the user of the rotary toothbrush will ordinarily bear during the use thereof to guide or direct the lip to the outer side of the shield and thus prevent the lip from being drawn

inwardly between the brush element and the shield. When the rotary brush is in use and placed against the teeth the brush element is usually designed to rotate in a manner to brush the teeth away from the gums, which is considered by dentists as the proper way to brush teeth. In actual practice where no lip guards are present, it has been found that brushes of this character disclosed in the prior art have a tendency to pull the lip inwardly against the bristles of the brush, and if a shield is present the tendency is to pull the lip between the brush and the edge of the shield. Serious injury to the lip may not necessarily result, but such an experience is decidedly unsatisfactory and unpleasant, discourages further use of the device by causing rawness and bleeding of the lip and has been considered the principal reason for the lack of commercial success of earlier rotary toothbrushes. It will be obvious that numerous specific forms of guard means may be designed to accomplish the main purpose of this invention and several of these forms have been disclosed herein.

In order to further distinguish the forms of the invention disclosed herein from those illustrated and described in my above referred to copending application, the lip guards herein are preferably formed of wire. The term wire as used herein is not intended to limit the invention to steel or other metallic forms of wire as this term is commonly understood, since the wire may be formed of thin extruded plastic material or any other material which may be suitable for this purpose.

The driving means for rotating the brush element may embody an electric motor inclosed within the handle portion or it may comprise a flexible shaft adapted to be connected to the rear end of the handle portion to drive a rotatable shaft within the handle to which the brush element is connected, as more specifically described in my above referred to co-pending application. The specific form of driving means is unimportant since the invention is primarily directed to the lip guards which prevent the lip of a user either from being drawn against the rotating brush element or from being drawn inwardly between the edges of the shield and the brush element during rotation thereof.

Referring now more specifically to the drawing, and more especially to Figs. 1, 2 and 3, the handle portion may be designated by the numeral 1 and may have integral therewith a shield 2 which extends forwardly from the lower side thereof and which may have an upstanding forward end 3 adapted to support one end of the spindle 4 of the brush element. The spindle 4 carries or supports bristles 5 which constitute a brush element. The inner end of the spindle 4 may be suitably connected to a rotatable shaft 6 within the handle 1 which may be caused to rotate by any suitable driving means and carry the brush therewith.

The form of lip guard constitutes a plurality of thin wire members 7 which extend between the upper edges 8 of the shield 2 and which are curved upwardly as at 9 at each end thereof and downwardly as at 10 in the center thereof. The downwardly curved or concave center of these wire guards permit the spindle 4 of the brush element to extend above the guard members and thus permit easy removal thereof for cleaning or replacement. The bristles 5 of the brush element will be free to rotate in the spaces between the wire guards 7, and the outer curved end portions 9 of the wire guards provide surfaces against which the lip of a user may bear and thus prevent the brush from drawing the lip inwardly between the bristles thereon and the edge of the shield, which, as has been mentioned above, is highly undesirable.

Figs. 4, 5 and 6 disclose a modified form of lip guard which also may be formed of wire. In this form of the invention, I provide a series of coils of wire 11 spaced apart along each edge 8 of the shield 2. These may be either individual and separate coils, or may be a continuous coil passing through the edge of the shield. In either event, each coil acts as an individual guard to prevent the lip of a user from being drawn inwardly between the edge of the shield and the rotating brush element. By being spaced, it permits the bristles to extend between the individual guards to insure adequate cleaning of the teeth.

This form of the invention also has the advantage of permitting easy removal of the brush element, because the individual coils are located on each side thereof and present no interference with the brush element when it becomes necessary for its removal either for cleaning or replacement.

A still further modified form of the invention is disclosed in Figs. 7, 8 and 9 wherein the shield 2 may be omitted as such, but may be embodied or integral with the lip guard. A continuous single coil of wire 12 is provided and which may be secured at one end 13 thereof directly to the forward end of the handle 1. The forward end 14 of the coil may be attached to the forward end of the spindle 4 of the brush element, whereupon the coil and spindle may mutually support each other. In this case, the single coil of wire will extend lengthwise of the brush element and will preferably surround the spindle 4 as clearly shown in Fig. 7. The spaces between the individual coils will permit passage of the bristles 5 therethrough for cleaning the teeth, and the curved surfaces of the coil on each side of the brush element will act as guard means preventing the lip of the user from being drawn inwardly against the bristles of the brush. The coil of wire itself extends below the brush element and acts as a shield to prevent the bristles from contacting the inner soft portions of the mouth when that side of the brush is exposed thereto. When it is desired to move the brush element, it is merely necessary to disconnect its forward end from the end 14 of the coil of wire, at which time it can be merely lifted out.

From the foregoing description it will be evident that I have provided a novel improvement in lip guards for use on rotary toothbrushes wherein the lip of a user is prevented from being drawn inwardly against the brush or between the shield and the brush during rotation thereof. It will be clear that changes from the specific form of wire lip guards disclosed herein may be made without in any way departing from the spirit of the invention or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended hereto.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A rotary toothbrush of the class described, comprising a handle portion, a brush element rotatably mounted at one end of said handle portion, guard supporting means having sides ex-

tending lengthwise of said brush element, and thin wire guard means having curved portions at both sides of said brush element and spaced apart throughout the length thereof, a part of the curvature of each portion being generally parallel to the periphery of said brush element to prevent the lip of a user from being drawn inwardly against said brush element during rotation thereof.

2. A rotary toothbrush of the class described, comprising a handle portion, a brush element rotatably mounted on a spindle at one end of said handle portion, guard supporting means having sides extending lengthwise of said brush element, and a plurality of wire guard members extending transversely of said brush element between the sides of said supporting means and between said spindle and said supporting means and spaced apart throughout the length thereof, whereby by the bristles of said brush element may extend between said members, and the ends of said members will prevent the lip of a user from being drawn inwardly between the sides of said supporting means and said brush element during rotation thereof.

3. A rotary toothbrush of the class described, comprising a handle portion, a brush element rotatably mounted at one end of said handle portion, a shield having edges extending lengthwise

of said brush element, said shield partially surrounding said brush element, and a series of spaced coils of wire mounted on each of the longitudinal edges of said shield to thereby prevent the lip of a user from being drawn inwardly between the edges of said shield and the brush element during rotation thereof.

DONALD P. GROVER.

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