March 15, 1938. W. H. DOYLE 2,111,238

TOOTH BRUSH

Filed July 3, 1935 2 Sheets-Sheet 1

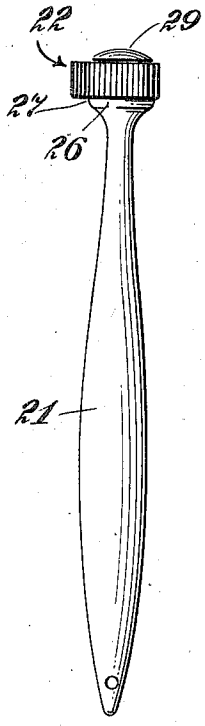


Fig. 1.

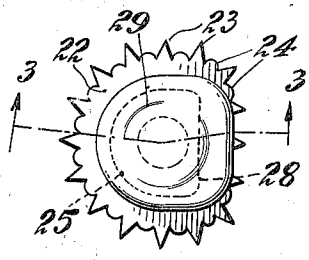


Fig. 2.

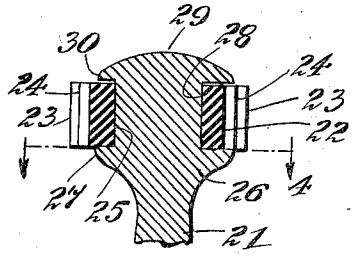
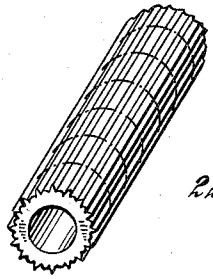


Fig. 3.



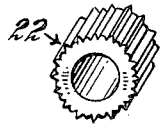


Fig. 5. Fig. 5a.

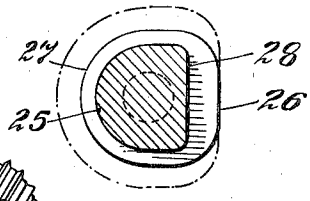


Fig. 4.

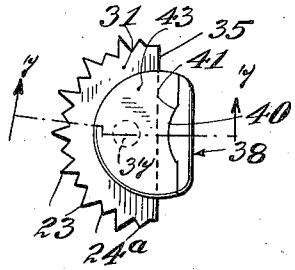


Fig. 6.

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TOOTH BRUSH

Filed July 3, 1935 2 Sheets-Sheet 2

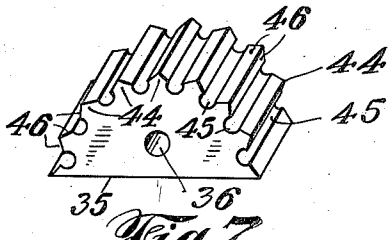


Fig. 7.

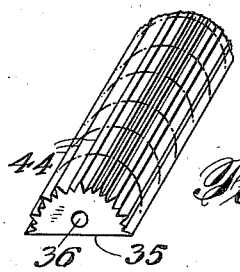


Fig. 8.

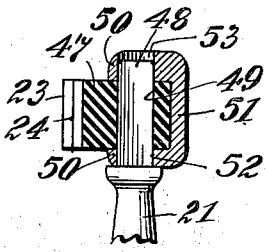


Fig. 10.

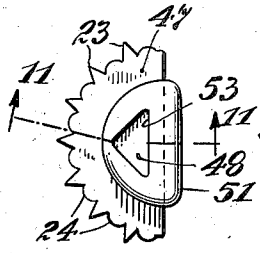


Fig. 9.

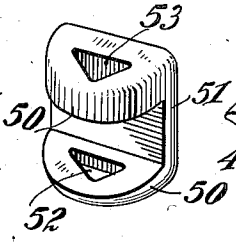


Fig. 11.

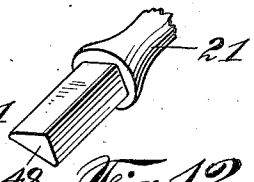


Fig. 12.

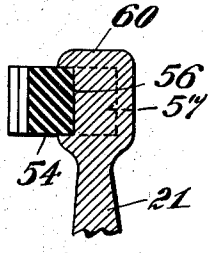


Fig. 14.

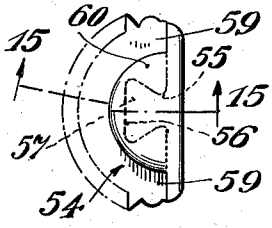


Fig. 13.

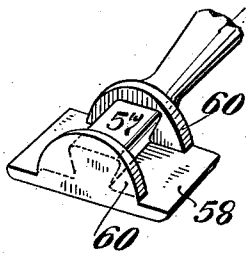


Fig. 15.

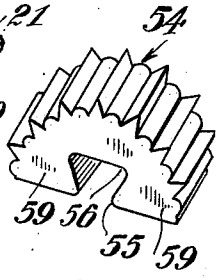


Fig. 16.

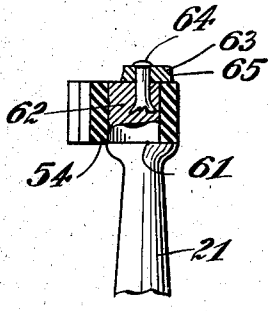


Fig. 18.

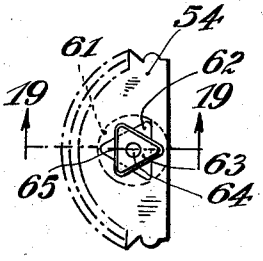


Fig. 17.

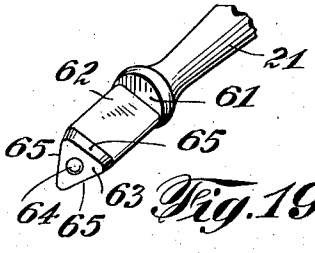


Fig. 19.

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Patented Mar. 15, 1938 2,111,238

UNITED STATES PATENT OFFICE

2,111,238

TOOTH BRUSH

William H. Doyle, White Plains, N. Y.

Application July 3, 1935, Serial No. 29,703

3 Claims. (Cl. 15—188)

This invention relates to tooth brushes and is herein disclosed as embodied in a structure having a metal or celluloid or other stiff handle and a rubber brush head or cleaning surface.

The ordinary bristle tooth brush, if properly designed, is a fairly effective cleaner of teeth when new and sterile, but after being used once it becomes a breeding place for germs. Moreover, after considerable use it becomes soft, bristles often wear short, others fall out, and the brush is both inefficient and unhygienic.

The bristle tooth brush is too costly to throw away after being used only once, is almost always slightly irregular when new, and sometimes sheds bristles at first, so that it is more agreeable to clean the teeth with a slightly worn tooth brush, even though more unhygienic.

According to the present invention these and other objections are overcome by building a brush out of a handle and a detachable head having a continuous elastic body and a head which may be rubber faced, the facing being preferably provided with flexible fins and being so low in cost that the facing may economically be used only once and then thrown away, with the result that a hygienic or sterile head is always available at trivial cost.

Moreover, the fins may be so formed that they tend to hold dentifrice at their bases so that the dentifrice is effectively positioned for tooth cleaning.

The head may take any of several forms, and the handle may also take any of several forms, one form holding the head by mere friction and grip of the elastic rubber, another form holding the head by a clamp, preferably so formed that no damp part can separate from the body part while the brush is usable.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 shows one form of brush including a separable handle and head.

Figure 2 is a large scale end view of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a view of an extruded tube for forming a series of head facings of one form.

Figure 5a is a view of a single head facing.

Figure 6 is an end view of another form of brush.

Figure 7 is a view of another form of cleaning member.

Figure 8 is a view of an extruded half-rod for forming a series of heads like that of Figure 5.

Figure 9 is an end view of still another form of brush head.

Figure 10 is a section on the line 11—11 of Figure 9.

Figure 11 is a view of a holding member.

Figure 12 is a view of the head end of the handle for the head of Figure 9.

Figure 13 is an end view of another form of brush head.

Figure 14 is a section on the line 15—15 of Figure 13.

Figure 15 is a view of the handle head.

Figure 16 is a view of the head to fit on the handle head of Figure 15.

Figure 17 is an end view of a brush head of another form.

Figure 18 is a section on the line 19—19 of Figure 17.

Figure 19 is a view of the handle head of Figure 17.

The brush of Figure 1, includes a handle 21 to be grasped, a head 26, a rubber facing 22 for the latter, including axial pointed fins 23 and axial rounded risers 24, the facing 22 being in the form of a ring or belt lying in a flat depression 25 in the handle head or end post 26.

In the form shown the head 26 of the handle is approximately half round with a diameter of one-half inch cut away one-sixteenth deep to make the depression 25 on the round front 27 and cut away on the nearly flat back 28 to one-eighth inch deep.

The end 29 of the handle is rounded smoothly off, turning to a sharp curve at the corner 30 to facilitate the pushing of the elastic rubber head 22 over the end 29 until it seats itself in the depression 25.

The elastic facing 22 is preferably annular and about five-eighths of an inch in diameter from the top of one rounded riser 24 to the top of the opposite riser 24, with a central opening about three-eighths of an inch in diameter. The fins or flappers 23 are shown separated by a cut one thirty-second of an inch deep from the round risers 24, and rise about one thirty-second of an inch above the tops of the risers 24.

The depression 25 in which rubber facing fits is shown as slightly over one-fourth inch long axially of the handle.

The end walls of the depression are shown as about one-sixteenth inch thick. The facing 22 fits closely in the depression 25, projecting well above the end walls on the rounded or cylindrical

face, to about double the free height of fin, but only the tops of the fins project above the end walls on the flat back **28**.

Thus as the brush is held in the hand and rotated back and forth on its axis, the fins **23** sweep over the teeth bending to and from the risers **24** and squeezing out from between them any dentifrice which has been applied to the head.

In the form shown, which is well adapted for extrusion, the head facing carries sixteen fins **23** and sixteen risers **24**.

The head and brush shown in Figure 6 include a handle **21** and brush head **31**, having long fins **23** and short or half-height fins **24a**, but held to the handle by a threaded clamp head or end wall **32** screwing into a threaded socket **33** in the flat end **34** of the handle **21**.

The brush head **31**, as more clearly seen in the view of the extruded half rod blank of Figure 9, is shown as having a flat back **35** and a three thirty-second inch opening **36** through which the threaded shank **37** of the clamp head **32** passes with a close fit, and nearly centrally of the elastic rubber.

Instead, one of the other heads, a head having a periphery like that shown in Figure 7, may be used having fins **44** which spring from undercut bases **45** so that the pockets formed by the relatively flat tops **46** may hold dentifrice, and may be limber and flexible enough to function as brush ends one-sixteenth inch long.

The brush head **47** shown in Figure 10 is adapted to fit closely over the slightly tapering triangular post **48** of the handle **21** of Figure 12, for this purpose being provided with a triangular opening **49** very slightly smaller than the post **48**. To hold the ends of the head **47** of the elastic rubber, the post **48** is of sufficient length to pass through both the upstanding ends **50** of a supporting frame **51**, adapted to closely fit the ends of the head **47**, and provided with triangular openings **52**, **53** in the ends **50** fitting closely over the post **48**.

The head **54** shown in Figure 14, like the head **47**, may have the surface shown in Figure 8, and is shown as provided with an opening **55** in its back which broadens to a wide cavity **56** (about three sixteenths deep) so as to be sprung over the deeply undercut post **57** projecting from the handle **21** and lying upon a flat floor **58** which supports the flanges **59** of the elastic rubber on each side of the opening **55**. To hold the ends of the head **54**, there are provided semicircular walls **60** at each end of the post **57**, rising from the floor **58** to closely fit the head. The floor is shown as three-fourths of an inch wide, exactly the width of the head, but the one-sixteenth inch walls terminate about one-eighth inch short of the sides of the floor.

The brush head shown in Figure 18 may be identical with the head **54** of Figure 14, but it abuts against a flat end **61** of the handle **21**, somewhat smaller than the solid end of the head, and is held on the triangular post **62** by a rotatable end **63** of the post. In the form shown the end **63** may be turned on its pivot **64**, so that its flat sides **65** lie exactly in line with the flat sides of the triangular post **62**.

Thus the head **54** slips easily over the post **62** in the position of Figure 19, but is held on the post when the end **63** is rotated on its pivot **64**. Apparently, the most satisfactory rubber composition for the heads is one carrying 43% or more of gum rubber, and, in the form shown, the heads are formed by extruding the rubber composition through dies which form the fins and risers longitudinally of the tube or rod or half rod as it issues.

The extruded rod or tube is then cut into suitable lengths, thus the whole process eliminates many of the difficulties and expenses of molding separate heads.

Having thus described certain embodiments of the invention, what is claimed is:

1. A brush head comprising a body the front face of which is substantially in the form of a segment of a cylinder and the rear face of which is substantially flat, and a rubber facing detachably mounted on said body and having flexible fins throughout at least a portion of its periphery and disposed longitudinally of the facing.

2. A brush head having a facing of a continuous flexible body provided throughout at least a portion of its periphery with fins extending longitudinally of the body and projections intermediate the fins of less depth than said fins and also extending longitudinally of the body.

3. The combination of a holder having end walls with triangular apertures, a handle, having a triangular end, for said holder, and a detachable and replaceable facing of resilient material inserted in the holder upon said handle and confined between end walls of said holder.

WILLIAM H. DOYLE.