March 22, 1938. W. E. WATERS 2,111,880

TOOTH BRUSH

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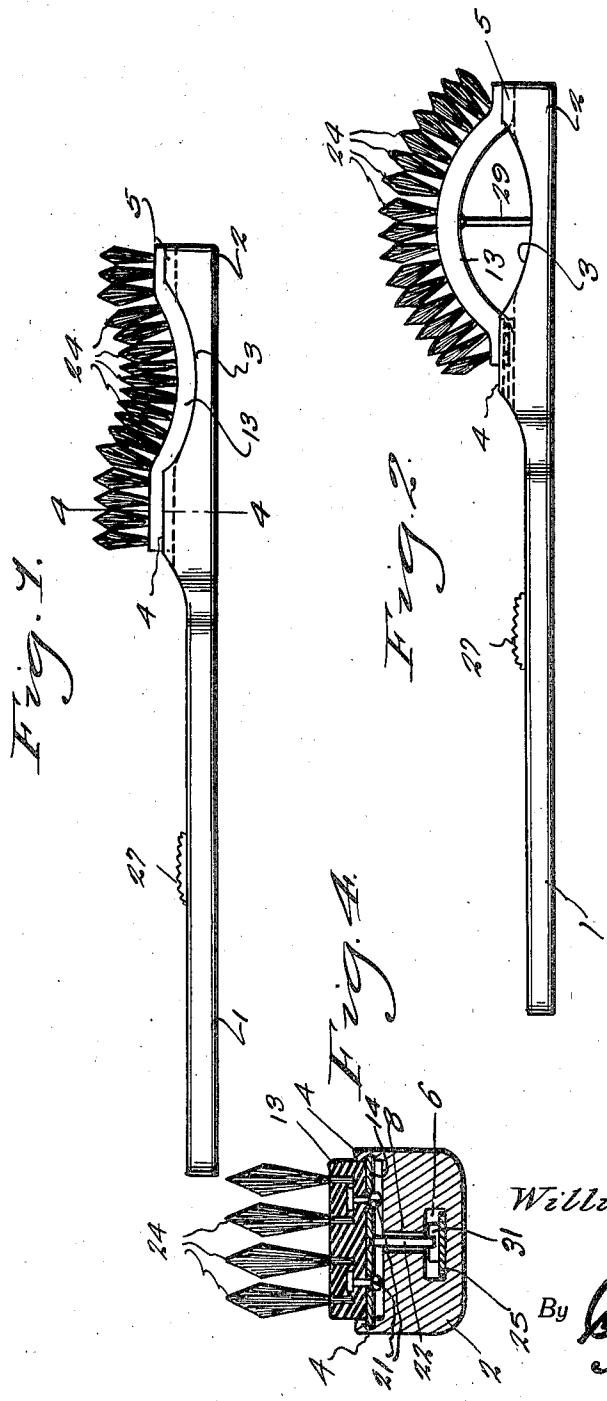


Fig. 1.

Fig. 2.

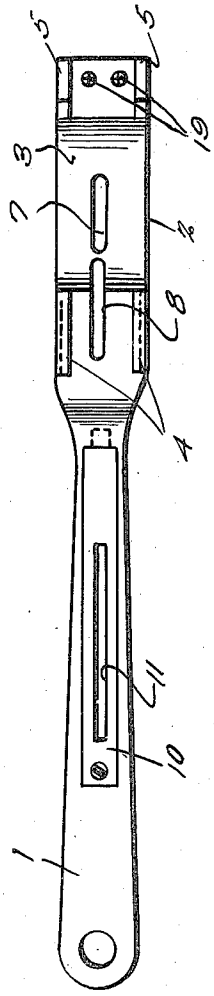


Fig. 3.

Fig. 4.

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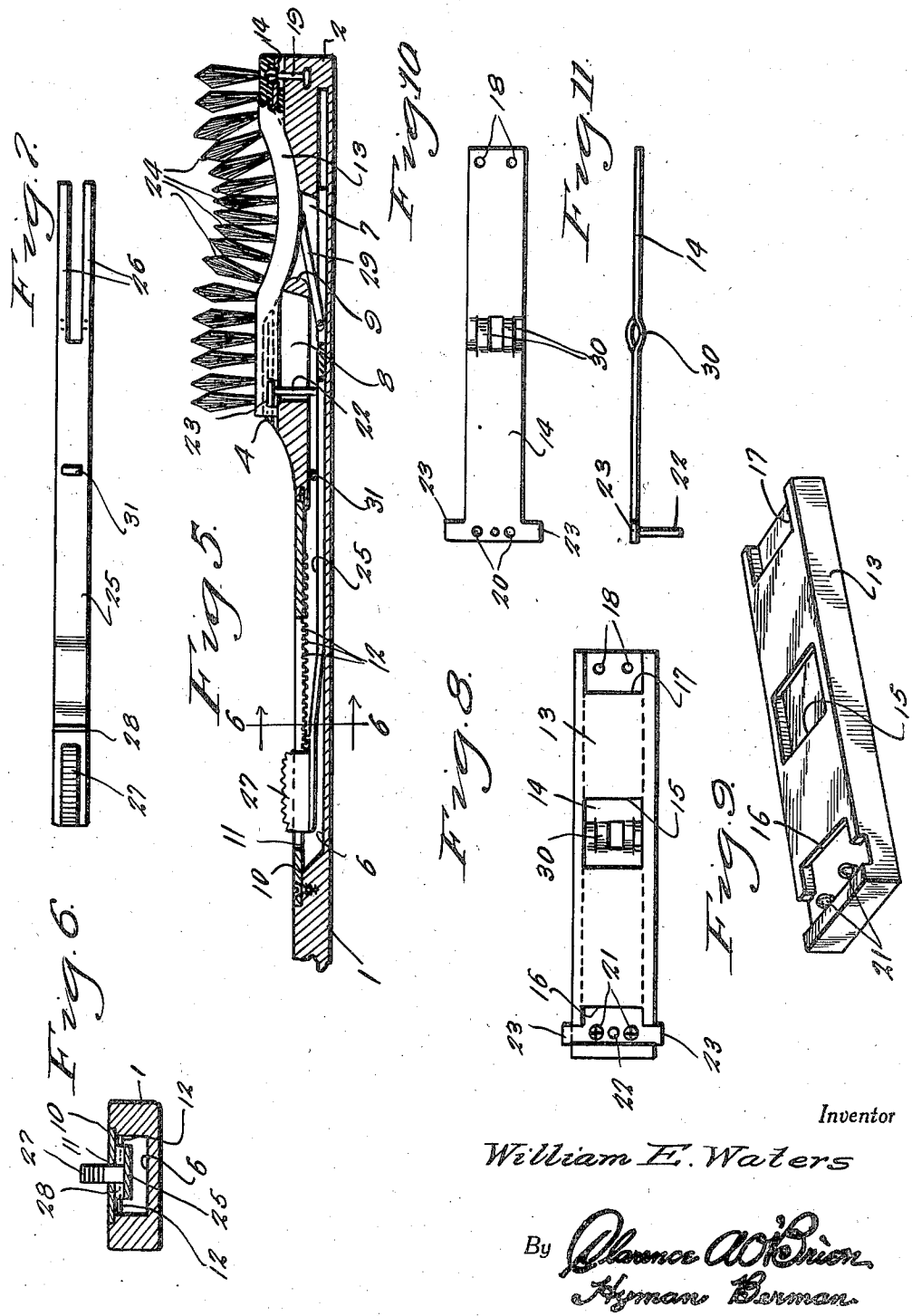


Fig. 1.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

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TOOTH BRUSH

William E. Waters, Plymouth, N. C.

Application March 2, 1937, Serial No. 128,662

5 Claims. (Cl. 15—176)

The present invention relates to new and useful improvements in toothbrushes and has for its primary object to provide, in a manner as hereinafter set forth, a device of this character which may be expeditiously adjusted to conform substantially to the inner or outer curvature of the teeth.

Another very important object of the invention is to provide a toothbrush of the aforementioned character embodying novel means for securing the device in adjusted position.

Still another very important object of the invention is to provide a toothbrush of the character described wherein the bristles may be replaced when desired.

Other objects of the invention are to provide a toothbrush of the character set forth which will be comparatively simple in construction, strong, durable, sanitary, light in weight and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation of a toothbrush constructed in accordance with the present invention, showing the bristles adjusted for contact with the outside of the teeth.

Figure 2 is a view in side elevation of the invention, showing the bristles adjusted for engagement with the inside of the teeth.

Figure 3 is a top plan view of the invention with the bristles and other parts omitted.

Figure 4 is a cross sectional view, taken substantially on the line 4—4 of Fig. 1.

Figure 5 is a view in vertical longitudinal section through the invention.

Figure 6 is a cross sectional view, taken substantially on the line 6—6 of Fig. 5.

Figure 7 is a detail view in top plan of the slidable bar.

Figure 8 is a bottom plan view of the rubber sleeve which carries the bristles and the resilient plate mounted therein.

Figure 9 is a bottom perspective view of the resilient sleeve.

Figure 10 is a bottom plan view of the resilient plate which is mounted in the sleeve.

Figure 11 is a detail view in side elevation of the plate shown in Fig. 10.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a handle 1 of suitable material having an integral head 2 on one end. The head 2 is provided with a substantially concave portion 3 in its top. Rising from the head 2 at the inner end of the substantially concave recess 3 is a pair of opposed, grooved guides 4. Rising from the head 2 at the outer end of the recess 3 are integral flanges 5.

Extending from the handle 1 into the head 2 is a longitudinally elongated chamber 6. The chamber 6 communicates with the recess 3 through a longitudinal slot 7 in the head 2. Also communicating with the chamber 6, inwardly of the slot 7, is a slot 8. The construction and arrangement is such that a fulcrum 9 is provided at the inner end of the slot 7. The inner portion of the chamber 6 communicates with the top of the handle 1 and mounted therein is a removable metallic plate 10 having a longitudinal slot 11 therein. Teeth 12 are provided on the lower side of the plate 10.

Mounted longitudinally on the head 2 and extending across the recess 3 therein is a resilient rubber sleeve 13. The resilient sleeve 13 is substantially rectangular in cross section and mounted longitudinally therein is a resilient metal strip or plate 14. The lower side of the sleeve 13 is provided with an opening 15 for exposing an intermediate portion of the resilient plate 14 and with end openings 16 and 17 for exposing the end portions of said resilient plate 14.

One end portion of the resilient plate 14 is provided with openings 18 for receiving snap fasteners 19 which are embedded in the outer end portion of the head 2. The other end portion of the resilient plate 14 is provided with openings 20 for receiving snap fasteners 21 in this end portion of the sleeve 13. Depending from this end portion of the resilient plate 14 is a pin 22 which is adapted to travel in the slot 8. Projecting laterally from this end portion of the resilient plate 14 are ears 23 which are adapted to travel in the grooved guides 4. The reference numeral 24 designates bristles which are embedded in the upper side of the sleeve 13.

Mounted for sliding adjustment in the chamber 6 is a manually operable bar 25 of suitable resilient metal having bifurcations 26 on its forward end. The slidable bar 25 terminates in a raised rear end portion having mounted thereon a thumb piece or button 27 which is operable in the slot 11. Adjacent the button 27 the bar 25 is provided with a transverse rib 28 which is engageable between the teeth 12 for releasably

securing said bar in adjusted position. A link 29 has one end pivotally connected to the slidable bar 25 between the bifurcations 26 and its other end pivotally and detachably connected to the resilient plate 14 at an intermediate point, as at 30. The intermediate opening 15 in the lower side of the rubber sleeve 13 accommodates the link 29. Rising from the slide 25 at an intermediate point is an abutment 31 which is engageable with the pin 22.

Briefly, the operation of the invention is substantially as follows:

When the slidable bar 25 is shifted to retracted position, as shown in Fig. 5 of the drawings, the link 29, sliding and pivoting on the fulcrum 9, draws the intermediate portions of the resilient plate 14 and the rubber sleeve 13 into the substantially concave recess 3 in the head 2, thus adjusting the bristles 24 to conform substantially to the curvature of the outside of the teeth. When pressure is removed from the button 27 after shifting the slidable bar 25 the rib 28 engages between the teeth 12 for releasably securing said bar 25 in adjusted position. When it is desired to adjust the bristles 24 to conform to the curvature of the inner side of the teeth, the bar 25 is moved forwardly or outwardly and the link 29 flexes the resilient plate 14 and the rubber sleeve 13 outwardly to the position shown to advantage in Fig. 2 of the drawings. When this occurs the inner end portions of the resilient plate 14 and the rubber sleeve 13 are caused to move forwardly or outwardly, the ears 23 travelling in the grooved guides 4 and the pin 22 travelling in the slot 8. When the adjustment shown in Fig. 2 is substantially reached, the abutment 31 on the slidable bar 25 engages the pin 22 for positively supporting the inner end of the resilient plate 14 and the rubber sleeve 13 against inward or rearward movement. Of course, the outer end of the resilient plate 14 and the rubber sleeve 13 are held stationary by the fastener elements 19 anchored in the outer end portion of the head 2. To replace the sleeves 13 and the bristles 24 when desired, the pivotal connection of the resilient plate 14 at 30 with the link 29 is disconnected and the forward end portion of said resilient plate is disengaged from the snap fasteners 19. The plate 14 may then be drawn forwardly to disengage the ears 23 from the grooved guides 4, after which the pin 22 may be lifted out of the slot 8. The rubber sleeve 13 may then be removed from the resilient plate 14 by disengaging the snap fasteners 21 from the openings 20, after which a new sleeve may be mounted on said resilient plate 14. Also, the slidable bar 25 with the link 29 thereon may be withdrawn from the chamber 6 at the rear end thereof by removing the plate 10 from the handle 1.

It is believed that the many advantages of a tooth-brush constructed in accordance with the present invention will be readily understood and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

1. A toothbrush comprising a handle, a head on one end of said handle, a resilient plate mounted on said head, bristles mounted on said resilient plate, a bar slidably mounted in the handle, and a link pivotally connected to said bar and to the resilient plate for selectively flexing said resilient plate inwardly or outwardly.

2. A toothbrush comprising a handle, a head on one end of said handle, a resilient metallic plate having one end anchored to the head, means slidably connecting the other end of the resilient plate to the head, bristles mounted on the resilient plate, a manually operable bar slidable in the handle, and means operatively connecting said bar to the resilient plate at an intermediate point for selectively flexing said resilient plate inwardly or outwardly.

3. A toothbrush comprising a handle, a head on one end of said handle, a resilient plate having one end anchored to the head, means slidably connecting the other end of said resilient plate to the head, a rubber sleeve mounted on the resilient plate, bristles mounted on said sleeve, a manually operable bar slidably mounted in the handle, and a link operativey connecting said bar to the resilient plate at an intermediate point for selectively flexing said resilient plate inwardly or outwardly.

4. A toothbrush comprising a handle, a head on one end of the handle, said head having a recess therein, longitudinal flanges on the head at one end of the recess, a pair of opposed, grooved longitudinal guides on the head at the other end of the recess, a resilient plate having one end detachably anchored to the head between the flanges, ears projecting from the other end of the resilient plate and slidably engaged in the grooved guides for slidably connecting said other end of the resilient plate to the head, a rubber sleeve mounted on the resilient plate, bristles projecting from said rubber sleeve, a manually operable bar slidably mounted in the handle, and a link operatively connecting said bar to the resilient plate at an intermediate point for selectively drawing said resilient plate into the recess or for flexing said resilient plate away from the recess.

5. A toothbrush comprising a handle, a head on one end of said handle, a resilient plate mounted on the handle and having one end anchored thereto, means slidably connecting the other end of the resilient plate to the head, bristles mounted on the resilient plate, a manually operable bar slidably mounted in the handle, means operatively connecting the bar to the resilient plate at an intermediate point for selectively flexing said resilient plate inwardly or outwardly, coacting means on the bar and the handle for releasably securing said bar against movement, and coacting means on the bar and the slidably connected end portion of the resilient plate for retaining said one end portion of the resilient plate against sliding movement in one direction when said resilient plate is flexed outwardly.

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