July 21, 1942. A. RICKENBACHER 2,290,357

TOOTHBRUSH

Filed May 20, 1941

Fig. 1.

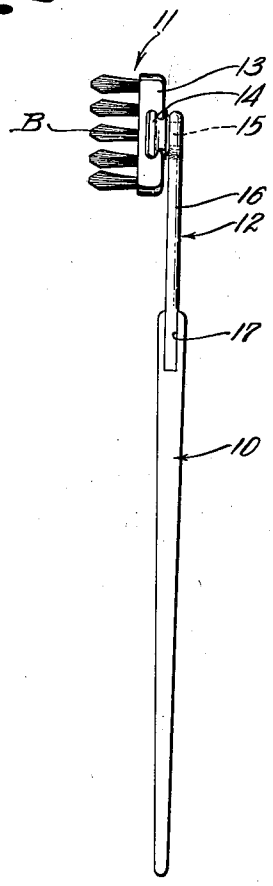


Fig. 2.

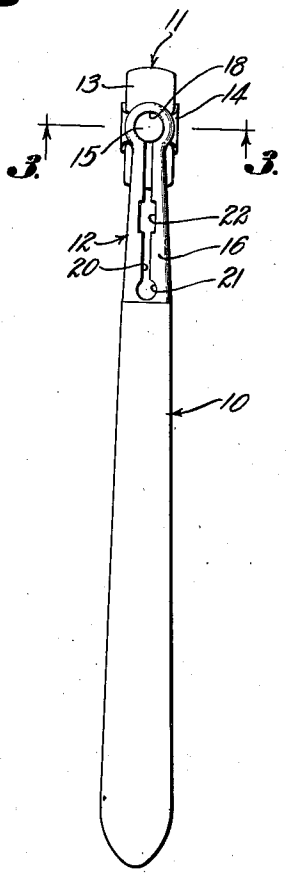


Fig. 4.

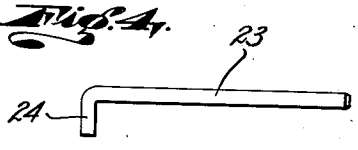


Fig. 3.

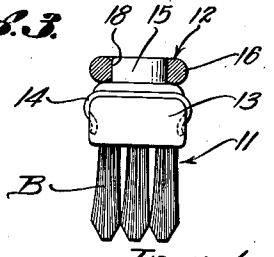
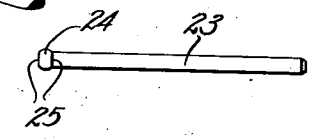


Fig. 5.



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TOOTHBRUSH

Adolph Rickenbacher, Los Angeles, Calif.

Application May 20, 1941, Serial No. 394,299

4 Claims. (Cl. 15—176)

This invention relates to tooth brushes and has particular reference to that class of tooth brushes embodying replaceable and adjustable brush heads. A general object of this invention is to provide a tooth brush of this character embodying simple, inexpensive yet very effective means for mounting or securing the removable brush head.

The tooth brushes that have been introduced embodying replaceable brush heads usually have complicated clamp means for retaining the brush heads. In most brushes of this class the clamp means has screw threads that become rusted and clogged with dentifrice and have metal parts of substantial bulk extending a considerable distance to the handle. The screw threaded clamp means are difficult to operate especially when they become clogged with dentifrice and the bulky metal clamp parts are liable to injure the teeth, gums and lips.

It is another object of this invention to provide a tooth brush of the class above referred to having novel means for adjustably and removably retaining the brush head which is devoid of screw threads and has no working or moving parts of any kind whatsoever.

Another object of this invention is to provide a tooth brush of the character mentioned in which the brush head is firmly and dependably held against movement and yet may be very easily adjusted or removed at will.

Another object of this invention is to provide a tooth brush of the character mentioned in which the brush head may be easily and quickly installed, adjusted and replaced without operating threaded parts, slides, latches or like mechanisms.

Another object of this invention is to provide a tooth brush of the character referred to embodying a plain simple shank of minimum length for carrying the brush head. The shank in the brush of the present invention is short and may be formed so that it cannot injure the teeth, gums or lips.

A further object of this invention is to provide a tooth brush of the class referred to that is inexpensive to manufacture, embodying a minimum number of simple inexpensive parts.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawing, in which:

Fig. 1 is an edge or side elevation of the tooth brush provided by this invention. Fig. 2 is a rear elevation of the tooth brush. Fig. 3 is an enlarged transverse detailed sectional view taken as indicated by line 3—3 on Fig. 2 with the brush head appearing in elevation. Fig. 4 is a side elevation of the key for operating or releasing the mounting or retaining means for the brush head and Fig. 5 is a plan view of the key.

The improved tooth brush of the present invention may be said to comprise, generally, a handle 10, a brush head 11, and means 12 for adjustably and removably mounting the brush head 11 on the handle 10.

The handle 10 may be of any selected shape, construction and material, it being a feature of the invention that the handle need not be of special formation or construction. In the case illustrated the handle 10 is a simple elongate member having generally flat outwardly convergent upper and lower sides and rounded edges. The outer end of the handle 10 is rounded while the inner end of the handle is preferably substantially straight. The handle 10 may be formed of selected or available materials such as thermo-plastic material, hard rubber, pyroxylin, bone, or the like, or, if desired, may be formed of metal.

The brush head 11 includes a backing or body 13 of bone, pyroxylin, thermo-plastic material, or the like, and tufts of bristles B set in the body to project from its forward face. The brush head body 13 is usually generally rectangular. A clip 14 preferably of metal is fixedly engaged on the body 13 and extends across its rear face. A pin or stud 15 extends outwardly or rearwardly from the clip 14. The stud 15 may be a simple cylindrical boss or projection located midway between the ends of the brush head body 13.

The means 12 for removably and adjustably supporting the brush head 11 on the handle 10 is an important feature of the invention. The means 12 includes or comprises a shank 16 of metal, or other selected material, having the required strength and having substantial resiliency. The shank 16 is formed and proportioned to normally resist flexing except under the special conditions to be later described. The shank 16 is secured to the handle 10 or is formed on the handle 10 to constitute an extension thereof. In the particular case illustrated the inner part of the shank 16 is set and secured in a slot or notch 17 formed in the end of the handle 10 and the shank extends or continues from the inner end of the handle. In most cases the shank 16 may be considerably thinner than the handle 10

and may have forwardly or outwardly converging edges as clearly illustrated in Fig. 2. The outer end portion of the shank 16 is formed to receive or support the brush head 11. The outer end portion of the shank 16 is of increased width and is provided with an opening 18. As best illustrated in Fig. 2 of the drawing the enlarged portion of the shank 16 provided with the opening 18 may be generally cylindrical in face elevation and is in the nature of a loop. The opening 18 is provided to receive the stud 15 of the brush head 11. In accordance with the invention the opening 18, as formed, is considerably smaller in diameter than the stud 15, although it may be proportioned so that the stud 15 may be forcibly pressed into it. The mouth of the opening 18 may be rounded to facilitate the insertion of the stud 15. As the two sides of the handle 10 and shank 16 may be the same the opposite ends of the opening 18 may be correspondingly tapered or rounded so that the stud 15 may be readily entered into either end of the opening.

In accordance with the invention the shank 16 is formed so that the opening 18 may be enlarged or spread to facilitate the insertion of the stud 15, the adjustment of the brush head 11 and the detachment or removal of the brush head. A slot 20 extends longitudinally or rearwardly from the opening 18. The slot 20 is preferably of substantial length and may extend rearwardly to adjacent the handle 10 where it may terminate in an enlargement or opening 21. It is preferred to make the slot 20 of substantial width but not of such width that the shank would be weakened. It will be apparent how the long slot 20 imparts substantial expansibility to the shank 16 so that the opening 18 is expansible to admit the stud 15 and to permit ready adjustment and removal of the brush head 11. The slot 20 may be proportioned to receive a small coin, a screw driver or similar implement for the purpose of spreading the shank to enlarge the opening 18.

It is desirable that the expanding force be applied or exerted between the ends of the shank 16 so that the shank will not be excessively expanded at any one point. Further, it is desirable that a sanitary readily available implement be employed to spread or expand the resilient shank 16. Accordingly, the slot 20 is enlarged or widened substantially midway between its ends, having a widened part 22 and a key 23 is provided to cooperate with this enlarged part of the slot. The enlargement 22 of the slot 20 may be generally rectangular and its opposite sides or walls may be generally flat and parallel. The key 23, as illustrated in Figs. 4 and 5 of the drawing, may be a length of rod or wire of substantial rigidity provided at one end with a laterally projecting part 24. The stock or material of which the key 23 is formed may be of such diameter that it cannot be introduced into the slot 20 or the enlargement 22 of the slot. The projecting part 24 of the key 23 is flattened on two opposite sides to have flat faces 25 lying in planes transverse of the longitudinal axis of the key. This flattening of the part 24 reduces its width and provides corners or cam parts cooperable with the opposing walls of the enlargement 22 in the slot 20.

When it is desired to spread the shank 16 for the purpose of enlarging the opening 18 the key part 24 is introduced into the enlargement 22 of the slot 20 and the key is turned so that the corners and curved faces occurring between the flat surfaces 25 cooperate with the walls of the slot enlargement to spread the shank 16. The key 23 and the key part 24 are formed so that the key is operable when inserted in one manner only, that is, with the flat faces 25 opposing the side walls of the slot enlargement 22 and with the body or handle of the key 23 extending at substantially right angles to the longitudinal axis of the shank 16 and brush handle 10. This insures the correct and intended use of the key. When the part 24 is introduced into the slot enlargement 22 and the key 23 is operated or swung the shank 16 is spread or enlarged so that the stud 15 may be readily passed into the opening 18, turned in the opening 18 or removed as the case may be. The resiliency of the shank 16 and the formation of the key 23 are such that the key will remain in an active position where it holds the shank 16 spread. The frictional engagement of the part 24 in the slot enlargement 22 holds the key 23 in an active position where the shank is expanded. Thus the key may be operated and temporarily left in the position where it holds the shank 16 spread so that the brush head 11 may be readily inserted, adjusted or removed without the necessity of retaining a hold on the key 23. Following use the key 23 is turned back to the position where it is substantially normal to the shank 16 and handle 10 and its part 24 is withdrawn from the slot enlargement 22. This permits the shank 16 to return to its initial or normal shape. In this connection it is to be understood that the shank 16 has sufficient resiliency to return to its initial proportions and configuration to tightly grip the brush head stud 15 even after extended use.

It is believed that the utility of the improved tooth brush of this invention will be readily understood from the foregoing detailed description. In use when it is desired to install a brush head 11 the stud 15 of the brush head may be forcibly pressed into the opening 18. The preferred procedure, however, is to introduce the part 24 of the key 23 into the slot enlargement 22 and then turn the key to spread the shank 16, whereupon the stud 15 may be freely entered in the opening 18. The operation of expanding the shank 16 may be effetced with one hand, by grasping the handle 10 and pressing on the key 23 with the thumb or with a selected finger of the hand. Withdrawal of the key 23 allows the shank 16 to return to its initial shape and the stud 15 is tightly held in the opening 18. In installing the brush head 11 it may be set at any selected angle with respect to the handle 10. At any time during the use of the brush head 11 the brush head may be reset or adjusted by merely expanding the shank 16 and turning the brush head.

When it is desired to replace the brush head 11 the part 24 of the key 23 is introduced in the slot enlargement 22 and the key is operated to expand or spread the shank 16. This frees the stud 15 and the worn brush head 11 may be readily withdrawn. The stud 15 of the new or replacement head 11 is inserted in the opening 18 and the brush head is set at the selected angle. The key 23 is then swung back to free the part 24 and the part is withdrawn from the slot enlargement 22. This allows the shank 16 to return to its normal shape so that the shank 16 is tightly retained in the opening 18.

It is to be observed that the tooth brush of the present invention is extremely simple in construction and is entirely devoid of threaded parts, slides, latches, or the like, that may become

rusted or clogged with dentifrice or that may be difficult to operate. The shank 16 is a simple one-piece part that may be shaped and proportioned so that it cannot injure the teeth or mouth. The shank 16 and other parts are readily cleaned and do not embody crevices or parts which harbor dentifrice and the like.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art or fall within the scope of the following claims.

Having described my invention, I claim:

1. Tooth brush handle means for a brush head having a mounting stud comprising a handle shank having an opening in its outer end initially too small to receive the stud except when inserted with substantial force and having a slot extending rearwardly from the opening, the slot having a widened flat walled part between its ends, and a key unable, because of its size, to enter the slot but readily engageable in the widened part of the slot and adapted when so engaged to be turned to act as a lever to spread the shank and thus enlarge the opening for the easy insertion and removal of the stud.

2. Tooth brush handle means for a brush head having a mounting stud of cylindrical cross section comprising a handle shank provided at its outer end with an opening which is round in cross section and having a slot leading rearwardly from the opening, the opening being initially too small to readily receive the stud, the slot having a widened non-circular part between its ends, and a key having a handle and an active part extending from the handle, the active part being too large for entrance into the slot but being engageable in the widened part of the slot and when so engaged being operable as a lever to spread the shank and enlarge the opening for the ready insertion of the stud and for the easy removal of the stud from the opening, the stud being turnable in the opening when engaged therein so that the head may be adjusted relative to the tooth brush handle means.

3. Tooth brush handle means for a brush head having a mounting stud of cylindrical cross section comprising a handle shank provided at its outer end with an opening of cylindrical cross section and having a slot leading rearwardly from the opening, the opening being initially too small to readily receive the stud, the slot having a widened flat walled part between its ends, and a key having a handle and an active part extending from the handle, the active part being too large for entrance into the slot but being engageable in the widened part of the slot and when so engaged being operable to spread the shank and enlarge the opening for the ready insertion of the stud and for the easy removal of the stud from the opening, said part of the key having two opposite flat faces cooperable with the opposite walls of the enlarged part of the slot to expand the shank when the handle of the key is swung, the stud being turnable in the opening when engaged therein so that the head may be adjusted relative to the tooth brush handle means.

4. Tooth brush handle means for a brush head having a mounting stud comprising a handle body, a shank of resilient material fixed to the inner end of the handle to extend therefrom, the shank having an opening in its end portion and a slot leading from the opening toward the handle and having a widened part between its ends of non-circular cross section, the opening being intended to receive the stud but initially being too small to receive the same without the use of substantial force, and an elongate key provided at one end with a lateral active part too large to enter the slot but engageable in the widened part of the slot and non-circular in cross section whereby it may be turned when in said widened part to expand the opening for the ready reception of the stud into the opening.

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