Nov. 3, 1953 H. E. CARLSON 2,657,412

FOLDING TOOTHBRUSH

Filed Nov. 30, 1948

FIG. 1

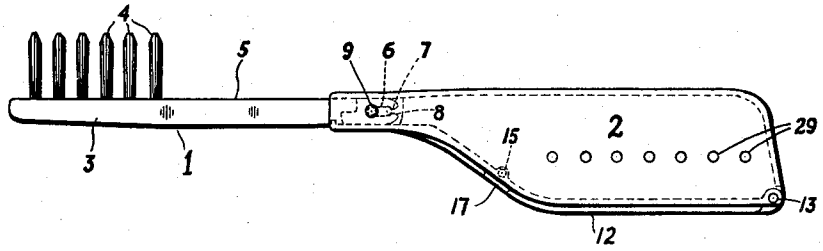


FIG. 2

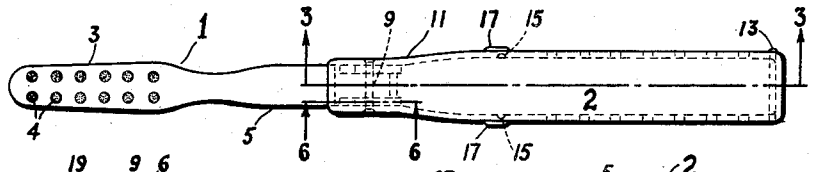


FIG. 6

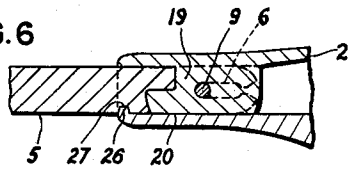


FIG. 3

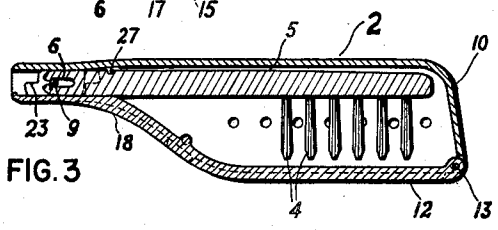


FIG. 7

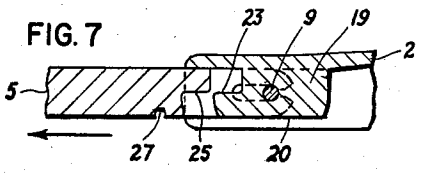


FIG. 8

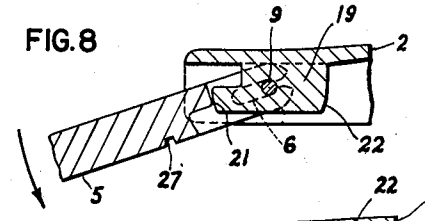


FIG. 9

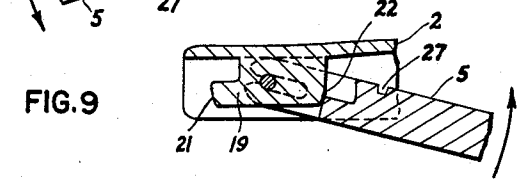


FIG. 4

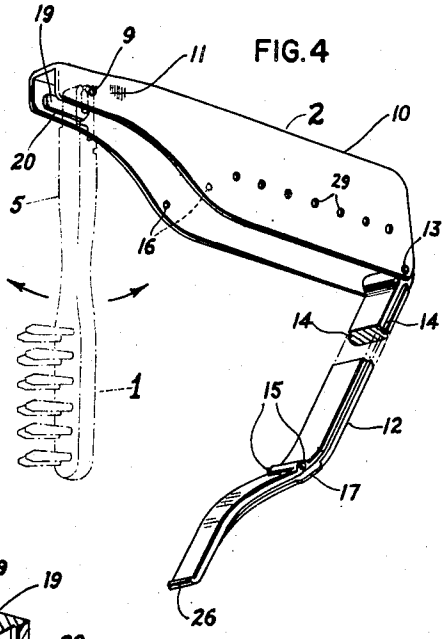
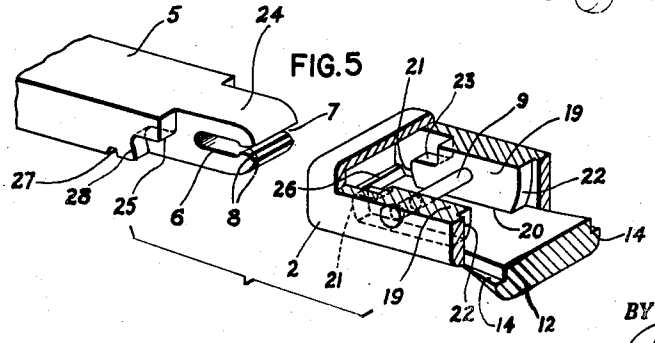


FIG. 5



INVENTOR.
HENRY E. CARLSON
BY Cornelius Zahuska
Attorney

Patented Nov. 3, 1953

2,657,412

UNITED STATES PATENT OFFICE

2,657,412

FOLDING TOOTHBRUSH

Henry E. Carlson, New Britain, Conn.

Application November 30, 1948, Serial No. 62,613

13 Claims. (Cl. 15—185)

1

This invention is a folding tooth brush of the general type wherein the handle of the brush is in the form of a container adapted to house the brush when not in use and from which the brush may be unfolded into convenient, accessible position for use.

Articles of this general character have been heretofore suggested and the object of the present invention is to improve materially thereon and to provide a more convenient, simple and efficient construction than heretofore.

In its preferred practical form, the tooth brush of this invention has a bristled head with an integral shank. The shank has a bifurcated end, formed by a longitudinally extending slot terminating at the end of the shank in a constricted mouth adapted for detachable connection with and for pivotal movement about a pivot pin carried by the container which constitutes the brush handle. This container is shaped to receive the brush and shank and has an open side adapted to be normally closed by a pivoted cover. When the cover is open, the brush may be pivotally moved into and out of the container and, when in the latter position and substantially alined with the container, these two parts are adapted for relative longitudinal movement to secure the brush against pivotal movement with respect to its handle.

The manner in which the brush is secured in this position of use constitutes an important feature of this form of the invention for the brush shank is provided at its lateral edges with steps adapted for interfitting relation with complementary stepped cheeks interiorly of the forward portion of the container to effectuate a remarkably rigid interfitting relation between these parts. The brush is adapted to be locked in this interfitting relation by a locking flange on the cover. When the cover is closed, this locking flange engages with a locking notch in the brush shank and as long as the flange is engaged with this notch, there can be no relative longitudinal movement between the brush and container. Means is provided for normally maintaining the cover in closed position, so that the locking flange on the cover is consequently kept in engagement with the locking notch in the brush shank whereby the brush cannot be inadvertently released during use. However, when the cover is opened, the brush may be longitudinally moved to permit of its pivotal movement hereinbefore referred to. This pivotal movement is guided by cam surfaces formed on the cheeks inside of the forward portion of the container and against which cam

2

surfaces the steps on the brush shank may bear to insure free, swinging operation of the brush as it is moved into and out of its handle.

The device of the present invention is well adapted for economical muanfacture in organic plastics, is neat in appearance, sanitary and hygienic and thoroughly efficient for its intended purposes.

Features of the invention, other than those adverted to, will be apparent from the hereinafter detailed description and appended claims when read in conjunction with the accompanying drawing.

The accompanying drawing illustrates one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a side elevation of the device of this invention showing the parts in condition for use.

Figure 2 is a top plan view of the structure shown in Figure 1.

Figure 3 is a section taken in the plane of the line 3—3 of Figure 2, but with the brush folded into the container.

Figure 4 is a perspective view showing the cover open and the brush, in phantom, in a midway position.

Figure 5 is a fragmental perspective showing contiguous ends of the brush shank and container, detached from one another with portions of the container broken away in the interest of clearness.

Figures 6, 7, 8 and 9 are fragmental sections taken in the plane of the line 6—6 of Figure 2 showing different relative positions of the parts.

As shown in the accompanying drawings, 1 designates the tooth brush and 2 the container. The tooth brush 1 consists of a head 3 with bristled tufts 4 and from the rear end of the head extends an integral shank 5. This shank is provided near its free end with a longitudinal slot 6 having a constricted mouth 7 opening to the end of the shank. The inlet to the mouth is beveled, as shown at 8, and the opposite ends of the slot 6 are curved on the radius of a pivot pin 9. The brush body and shank are preferably made from an organic plastic or some other suitable material sufficiently resilient to permit the mouth 7 of the slot to be sprung open, so as to allow the passage of the pin 9 through the mouth into or out of the slot 6, the mouth 7 being sufficiently constricted to normally retain the pin in the slot.

The container 2 is in the form of a casing com-

prising a hollow body 10 of a size and shape to house the head of the brush and provided at one end with a neck 11 of reduced size having a cross section corresponding substantially to the cross section of the shank of the brush and adapted to house the end portion of the shank. As shown in the drawings, the bottom of the container is open throughout its length, but this open side is adapted to be closed by a cover 12, pivoted at the rear end of the container on a hinge pin 13. Both lateral edges of the cover are rabbeted, as shown at 14, so that the contiguous edges of the side walls of the container will fit into the rabbets and produce a nice flush appearance when the cover is closed. The rabbeting of the cover into the open side of the container also serves to reinforce the walls of the container when the cover is closed.

To hold the cover in closed position, it is provided at its opposite edges with locking projections 15 adapted to seat in correspondingly shaped depressions 16 in the opposite side walls of the container, the natural spring or resiliency of these walls serving to permit engagement and disengagement of the locking projections with said depressions. Juxtaposed with the projections 15, the cover may be provided with laterally extending finger pieces 17 to be grasped when it is desired to open the cover. As these finger pieces are adjacent the locking projections, they facilitate the opening of the cover without placing undue strain on such cover. To strengthen the cover longitudinally it is preferably made thicker than the wall of the container. It is thickened additionally in the region 18 adjacent the neck 11 to provide an extended upper inside surface to support the brush when the latter is in inoperative position within its handle, as shown in Figure 3. This thickening also contributes to the strength of the cover, so that it will not have excessive spring.

The end of the neck of the container is open and adjacent such opening it is provided interiorly with thickened wall portions forming cheeks 19 at the opposite sides of the neck. These cheeks, as shown in the drawing, extend downwardly from the upper wall of the neck to near the lower edges of its side walls, and the lower edges of said cheeks form flat surfaces 20 against which the free end portion of the cover is adapted to seat. The forward and rear ends of the checks are provided with cam surfaces 21 and 22, respectively, which are curved on arcs concentric with the pivot pin 9 which passes through both cheeks and bridges the space between them, as shown best in Figure 5. The forward upper portion of each cheek, however, is undercut or stepped to provide an abutment 23, the abutment being parallel to but spaced from the top wall of the neck.

As hereinbefore stated, the shank 5 of the brush 1 is adapted to cooperate with the pivot pin 9; and consequently the free or slotted end of said shank is shaped and proportioned to fit into the neck of the container. That is to say, the free end of the shank 5 is reduced in width for a distance somewhat greater than the length of the slot 6, so that the slot is, in effect, positioned within a tongue 24 integral with the free end portion of the shank of the brush, as shown best in Figure 5. This tongue is of a width substantially equal to the distance between the inner faces of the cheeks 19, while the thickness of the tongue is substantially the same as the distance between the inner face of the top wall of the neck and the upper surface of the cover when the latter is closed. At the base of the tongue 24, the lateral edges of the shank of the brush are cut away or stepped complementarily to the stepped forward ends of the cheeks 19, so as to form on said shank abutments 25 complementary to and adapted to cooperate with the abutments 23 of the cheeks 19.

The parts are so arranged and proportioned that, when the slot 6 of the shank embraces the pin 9, with the pin at the forward end of the slot, the complementary stepped portions on the shank of the brush and the stepped portions of the cheeks will interfit with one another to bring the abutments 23 and 25 into face abutting relation and thus preclude pivotal movement of the brush with respect to the container, so long as these abutments are in engagement with one another. The parts are maintained in this position, when the cover is closed, by a locking flange 26 carried by and extending across the free end of the cover and adapted to seat in a correspondingly shaped and positioned transverse notch 27 formed in the under side of the shank of the brush, as shown best in Figure 6.

It is to be noted that the undercut faces 28 (Figure 5) at the opposite lower sides of the shank are curved on the same radius as the cams 21 of the cheeks, so that, when the parts are in the assembled relation referred to, the stepped portions of both the brush shank and the cheeks contact one another throughout, as clearly shown in Figure 6. However, when the cover is opened to withdraw the locking flange 26 from the notch 27, the brush may be moved longitudinally to withdraw the abutments 25 of its shank from the abutments 23 of the cheeks, as shown in Figure 7. In this position, the rear end of the slot 6 will be engaged with the pivot pin 9 and consequently the brush may be pivotally moved from the position of Figure 7 through the positions of Figures 8 and 9 into the position of Figure 3 to place the brush wholly within the container.

It will be noted from Figure 8 that, as the brush starts to move in an anticlockwise direction from its operative to its inoperative position, the cam surfaces 21 at the forward ends of the cheeks guide the brush during its initial pivotal movement. As the brush moves into the container, as shown in Figure 9, the cams 22 at the rear ends of the cheeks engage with the stepped portions of the brush, and maintain it in such position that the rear end of the slot 6 remains against the pin 9, so that the brush cannot become jammed within the container when it is subsequently desired to unfold the brush into its position of use. As shown in the drawing, the end of the tongue 24 is rounded so as not to interfere with the pivotal movement referred to. This rounded end is curved substantially on the center of the pivot when the latter occupies the contiguous end of the slot.

The brush and its handle remain connected to one another by the pivot pin 9 during all normal operations of the article. However, when it is desired to replace a worn brush with a new one, the worn section may be readily detached from the container by merely pulling them apart when the brush is in a position substantially perpendicular to its handle, as indicated in phantom in Figure 4, employing sufficient force to spring the pivot pin 9 through the constricted mouth 7 of the slot 6. A new brush may then be associated with the pin 9 by merely forcing the tapering or beveled mouth against the pin with

sufficient pressure to spring the mouth open enough to admit the pin into the slot. The beveled surfaces 8 make this operation relatively easy.

The construction shown and described is highly efficient. All forces applied to and transmitted by the brush during use are effectively withstood by the walls of the neck of the container, the pivot pin, the brush shank tongue, the locking tongue on the cover, and the complementary abutments of the brush shank and cheeks within the neck of the container, all of which function individually and in concert to insure marked rigidity of the structure as a whole. The container is of neat, compact and pleasing appearance and affords a convenient handle for the brush in use. The perforations 29 shown in Figure 4 are for ventilation.

When the brush is within the container, as shown in Figure 3, the fit between the tongue 24 and the inner surfaces of the neck of the container, with the pivot pin and the upper supporting surface of the cover, maintain the brush head in such position that the bristles are free from contact with any part of the container and thus are not deformed by pressure against the walls thereof.

The foregoing detailed description sets forth the invention in its preferred practical form, but the invention is to be understood as fully commensurate with the appended claims.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A folding tooth brush comprising: a hollow handle having an open end with a pivot pin within its interior adjacent said open end, the opposite walls of the handle in the region of the pin having interior cheeks with transverse abutments, said handle also having an open side with a cover to normally close the same, a tooth brush having a shank with a longitudinal slot embracing said pivot pin permitting both pivotal and longitudinal movement of the brush on the pin, said shank being also provided at its lateral edges with abutments complementary to and adapted to engage with the abutments of said cheeks when the brush is moved longitudinally and the pivot pin is at the corresponding end of said slot to lock the brush against pivotal movement with respect to the handle, said shank being longitudinally shiftable to disengage said abutments and permit the brush to be pivotally moved on the pin into a position within the hollow handle.

2. A folding tooth brush comprising: a hollow handle having an open end and a pivot pin within its interior adjacent said open end and said handle also having an open side with a hinged cover to normally close the same, and a tooth brush having a shank with a bifurcated end formed by a longitudinal slot having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin into and out of the slot, said brush being pivotally movable into and out of the handle when the cover is open and being slidable on the pin when in alined position exteriorly of the handle to secure the handle and brush against pivotal movement.

3. A folding tooth brush comprising: a hollow handle having an open end and a pivot pin within its interior adjacent said open end and said handle also having an open side with a hinged cover to normally close the same, a tooth brush

having a shank with a bifurcated end formed by a longitudinal slot having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin into and out of the slot, said brush being pivotally movable into and out of the handle when the cover is open and being slidable on the pin when in alined position exteriorly of the handle to secure the handle and brush against pivotal movement, and a locking member on the cover engageable with a notch in said shank to lock the brush to the handle in this position when the cover is closed.

4. A folding tooth brush comprising: a hollow handle having an open end with a pivot pin within its interior adjacent said open end, the opposite walls of the handle in the region of the pin having interior cheeks with transverse abutments, said handle also having an open side with a hinged cover to normally close the same, a tooth brush having a shank with a bifurcated end formed by a longitudinal slot to slidably receive said pivot pin and having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin therethrough into and out of the slot, said shank being also provided at its lateral edges with abutments complementary to and adapted to engage with the abutments of said cheeks when the brush is moved longitudinally and the pivot pin is at the corresponding end of the slot to lock the brush against pivotal movement with respect to its handle.

5. A folding tooth brush comprising: a hollow handle having an open end with a pivot pin within its interior adjacent said open end, the opposite walls of the handle in the region of the pin having interior cheeks with transverse abutments, said handle also having an open side with a hinged cover to normally close the same, a tooth brush having a shank with a bifurcated end formed by a longitudinal slot to slidably receive said pivot pin and having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin therethrough into and out of the slot, said shank being also provided at its lateral edges with abutments complementary to and adapted to engage with the abutments of said cheeks when the brush is longitudinally shifted to position the pivot pin at the corresponding end of the slot to lock the brush against pivotal movement with respect to its handle, and a locking projection on the cover engaging with a locking depression in said shank to maintain said abutments in cooperative relation.

6. A folding tooth brush comprising: a hollow handle having an open end with a pivot pin within its interior adjacent said open end, the opposite walls of the handle in the region of the pin having interior cheeks with transverse abutments, said handle also having an open side with a hinged cover to normally close the same, a tooth brush having a shank with a bifurcated end formed by a longitudinal slot having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin therethrough into and out of the slot, said shank being also provided at its lateral edges with abutments complementary to and adapted to engage with the abutments of said cheeks when the pivot pin is at the corresponding end of the slot to lock the brush against pivotal movement with respect to its handle, and a locking projection on the cover engaging with a locking depres-

sion in said shank to maintain said abutments in cooperative relation when the cover is closed, said shank being longitudinally shiftable to disengage the abutments and permit the brush to be pivotally moved on the pin into a position within the hollow handle when the cover is open.

7. A folding tooth brush comprising: a hollow handle having an open end with a pivot pin within its interior adjacent said open end, the opposite walls of the handle in the region of the pin having interior cheeks with transverse abutments, said handle also having an open side with a hinged cover to normally close the same, a tooth brush having a shank with a bifurcated end formed by a longitudinal slot having at the end of the shank a constricted outlet mouth which may be sprung open to permit the passage of said pivot pin therethrough into and out of the slot, said shank being also provided at its lateral edges with abutments complementary to and adapted to engage with the abutments of said cheeks when the pivot pin is at the corresponding end of the slot to lock the brush against pivotal movement with respect to its handle, and a locking projection on the cover engaging with a locking depression in said shank to maintain said abutments in cooperative relation when the cover is closed, said shank being longitudinally shiftable to disengage the abutments and permit the brush to be pivotally moved on the pin into a position within the hollow handle when the cover is open, said cheeks having cam surfaces for guiding the brush during such pivotal movement.

8. A refill tooth brush having a shank provided adjacent its free end with a longitudinal slot having at the end of the shank a constricted outlet which may be sprung open to permit the passage therethrough of a pivot pin into and out of the slot, said slot having an elongated longitudinal portion throughout which the width of the slot is at least as great as the diameter of the pin to be received therein, whereby the brush shank is longitudinally slidable on the pivot pin when the pivot pin is in said elongated longitudinal portion of said slot.

9. A refill tooth brush having a shank provided at its free end with a centrally disposed tongue of reduced width, the lateral edges of the shank at the base of the tongue having transversely disposed abutments and the tongue having a bifurcated end formed by a longitudinal slot provided at the end of the tongue with a constricted outlet mouth which may be sprung open to permit the passage therethrough of a pivot pin into and out of the slot, said slot having an elongated longitudinal portion throughout which the width of the slot is at least as great as the diameter

of the pin to be received therein, whereby the brush shank is longitudinally slidable on the pivot pin when the pivot pin is in said elongated longitudinal portion of said slot.

10. A folding tooth brush handle comprising: a hollow container having at its forward end a neck of reduced cross section terminating in an open end, said container also having an open side for its full length, and a pivoted cover to normally close said open side, there being provided on the interior of the neck and at the opposite sides thereof thickened cheeks transversely spaced from one another and stepped at their forward ends to provide transverse brush engaging abutments, and a brush pivot transversely of said neck.

11. A folding tooth brush comprising: a hollow handle having a pivot, and a tooth brush having a shank provided near its free end with a slot extending longitudinally of the shank and terminating at the end of the shank in a constricted mouth adapted to be sprung open to permit the passage of the pivot into and out of said slot, said slot having an elongated longitudinal portion throughout which the width of the slot is at least as great as the diameter of said pivot, whereby said brush is arcuately movable on the pivot into and out of the handle and longitudinally slidable on the pivot to lock the brush against or release it for such arcuate movement.

12. A folding tooth brush as claimed in claim 1, wherein the cheeks have cam surfaces to engage with the abutments of the shank to guide the latter during pivotal movement of the brush.

13. A folding tooth brush comprising: a hollow handle and a tooth brush pivotally mounted therein, said handle having cam means for guiding the tooth brush for at least part of its pivotal movement, both the brush and the handle having complementary locking abutments and the brush having a slotted connection with the handle to permit the abutments of the brush and handle to be engaged with one another to lock the handle against pivotal movement and to be disengaged from one another to permit the pivotal movement of the brush into and out of the handle.

HENRY E. CARLSON.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
666,360	Shearer	Jan. 22, 1901
1,104,365	Loughlin	July 21, 1914
1,464,250	Lieberthal	Aug. 7, 1923
1,960,807	Cole	May 29, 1934