April 28, 1959 P. KAYE ET AL 2,883,692

RETRACTABLE TOOTHBRUSH WITH ROTARY LOCK

Filed July 11, 1957

Fig. 1

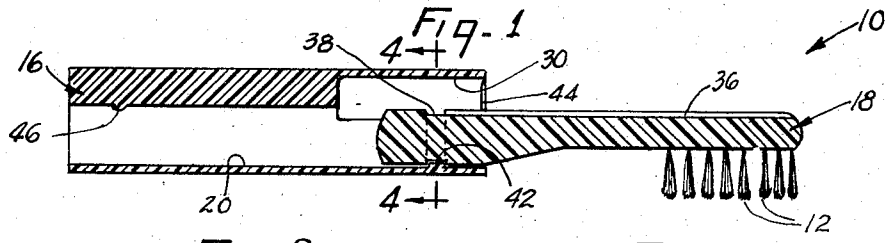


Fig. 2

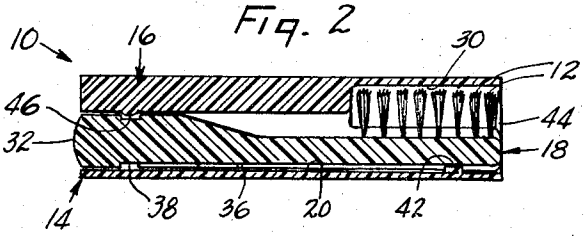


Fig. 3

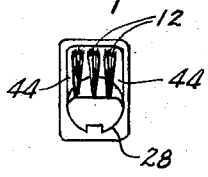


Fig. 4

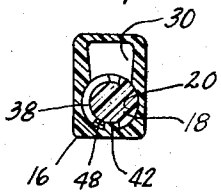


Fig. 5

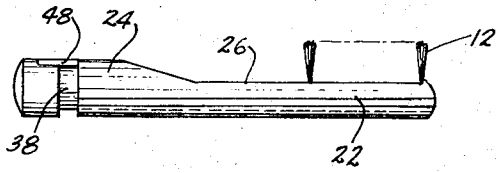


Fig. 6

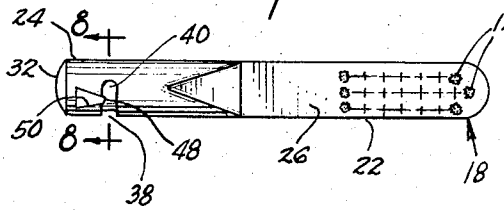


Fig. 7

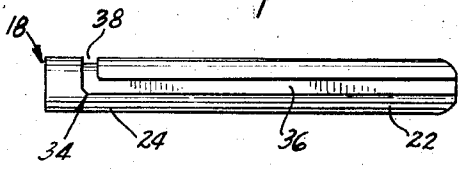
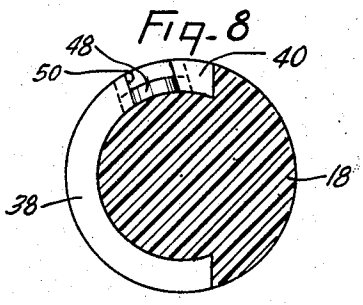


Fig. 8



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2,883,692

RETRACTABLE TOOTHBRUSH WITH ROTARY LOCK

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Application July 11, 1957, Serial No. 671,205

4 Claims. (Cl. 15—184)

This invention relates to brushes, particularly toothbrushes or the like.

One object of the present invention is to provide a new and improved toothbrush which is retractable, so that it may be carried very conveniently in a pocket, purse, handbag or the like.

A further object is to provide a new and improved retractable toothbrush which is highly serviceable for its intended use of brushing teeth.

Another object is to provide a new and improved retractable toothbrush which locks securely in its extended position.

A further object is to provide a retractable toothbrush which also has means to retain the brush in its retracted position.

It is another object to provide a retractable toothbrush in which the bristles are positioned very conveniently, for an easy and comfortable brushing action, when the brush is extended.

Still another object is to provide a new and improved retractable toothbrush which is compact and attractive in appearance, yet is reasonably simple in construction and extremely low in cost.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of a retractable toothbrush to be described as an illustrative embodiment of the present invention, the view being taken along the axis of the brush with the brush extended.

Fig. 2 is a view similar to Fig. 1 with the brush retracted.

Fig. 3 is an end view of the brush with the brush retracted.

Fig. 4 is a transverse sectional view, taken generally along a line 4—4 in Fig. 1.

Fig. 5 is an elevational view of a telescopically movable bar or handle member embodied in the brush.

Figs. 6 and 7 are top and bottom plan views showing opposite sides of the bar of Fig. 5.

Fig. 8 is an enlarged cross sectional view, taken generally along a line 8—8 in Fig. 6.

As already indicated, the drawings illustrate a brush **10** which is retractable between the extended position of Fig. 1 and the retracted position of Fig. 2. The brush **10** is intended primarily for use as a toothbrush, but, of course, it may be employed for any other suitable purpose, with or without modifications to adapt the brush for other uses. It will be apparent that the brush is extremely compact when it is retracted, as shown in Fig. 2, so that it may be carried very conveniently in a pocket, purse, handbag or the like. When the brush is extended, as shown in Fig. 1, it is fully and conveniently serviceable for brushing teeth.

Generally, the illustrated toothbrush **10** comprises a plurality of suitable bristles **12** mounted on a handle **14** having two parts or members **16** and **18** which are engaged for telescoping movement between the extended and retracted positions of the brush. Thus, the handle member **16** is formed with a longitudinal bore or opening **20** which is adapted to receive the second handle member **18**. It will be seen that the second handle member **18** takes the form of a bar which is generally cylindrical in shape, for reception in the bore **20**. The bar **18** has an outer end portion **22**, on which the bristles **12** are mounted, and an inner end portion **24** which is substantially cylindrical in shape. In effect, the outer portion **22** is offset laterally with respect to the inner portion **24**. Thus, the outer portion **22** has a substantially flat longitudinal surface **26** which is set in from the corresponding side of the inner portion **24**. The bristles **12** project laterally from the flat surface **26**. On its opposite side, the outer portion **22** has a cylindrically curved surface **28** which constitutes an extension of the cylindrical outer surface on the inner portion **24**.

In this case, the hollow handle or grip member **16** is generally rectangular in cross section. The bore **20** is offset laterally in one direction from the axis of the member **16**. To receive the bristles **12**, the member **16** is formed with a recess or cavity **30** which extends laterally from one end of the bore **20** in a direction opposite from the direction in which the bore is offset. The recess **30** is of a shape and size corresponding closely to the contour or bulk of the bristles **12**. In this case, the recess **30** is generally rectangular in shape.

When the brush **10** is retracted, the bar **18** is received almost entirely within the bore **20**, while the bristles **12** are housed within the recess **30**. The bar **18** has a rounded end portion **32**, at its base or inner end, which projects slightly out of the bore **20**, when the brush is retracted, for use in extending the brush.

When the brush **10** is extended, the bar **18** is slid part way out of the bore **20** so that only the base or inner portion **24** remains therein. The outer portion **22** of the bar and the bristles **12** are fully extended from the hollow grip member **16**. In extending the brush **10**, the bar **18** is given a half twist so that the bristles **12** will extend in a direction opposite to that in which they extend when the brush is retracted. In this way, the bristles are conveniently position for use in brushing teeth. The bristles extend beyond the contour of the grip member **16** so that the brush may be employed without any substantial possibility that the grip member **16** will strike the teeth or lips of the user.

In order to guide the extension and retraction of the brush **10**, one of the handle members is formed with a track which is engaged by a follower element on the other handle member. In this case, the track takes the form of a groove **34** on the bar **18**. It will be seen that the groove **34** has a longitudinal portion **36** and a circumferential portion **38**. The longitudinal portion **36** extends along the entire outer portion **22** of the bar **18**, at a point thereon generally opposite from the bristles **12**. The inner end of the longitudinal groove portion **36** communicates with one end of the circumferential portion **38**. It will be seen that the circumferential portion **38** extends part way around the inner portion **24** of the bar **18**. More specifically, the circumferential groove portion **38** extends approximately half way around the cylindrical portion **24**. The circumferential groove portion **38** has a closed end **40** on the opposite side of the bar **18** from the longitudinal groove portion **36**.

In the illustrated brush **10**, the groove **34** is followed by a generally circular key or follower **42**, which projects into the bore **20** at a point opposite from the recess **30**. When the brush **10** is retracted, the projection **42** is engaged with the keyway or groove element **36** at a point opposite from the bristles **12**, as shown in Fig. 2. It will be apparent that the engagement between the projection

42 and the longitudinal groove portion 36 insures that the bristles 12 will be properly aligned for reception in the cavity 30. The passage of the bristles 12 into the cavity 30 may be facilitated by forming chamfers or bevels 44 on the handle member 16 at the entrance to the cavity 30. It will be apparent from Figs. 1–3 that the bevels 44 flare from the entrance end of the cavity or recess 30, and are adapted to align the bristles with the cavity. Moreover, the bevels will compress the bristles for easy entrance into the cavity if the bristles have been spread or flared by use. Thus, the bristles are restored to their original contour whenever the bristles are retracted into the cavity.

A catch or detent 46 is provided to detain the brush 10 in its retracted position, so as to prevent accidental extension of the brush. In this case, the catch 46 simply takes the form of a projection extending a small distance into the bore 20 adjacent the inner end of the hollow grip member 16. The catch 46 is engageable with the circumferential groove portion 38 when the bar 18 is fully retracted.

The brush 10 is extended by sliding the bar 18 longitudinally out of the bore 20. The initial extending movement may be brought about by pushing inwardly on the projecting end portion 32 of the bar 18, until the outer portion 22 of the bar may be grasped and pulled out of the bore 20.

The brush 10 is locked in its extended position by rotating the bar 18 through approximately a half turn. During such retention of the bar 18, the projection 42 travels along the circumferential groove portion 38, until the projection arrives at the closed end 40 of the groove 38. A second catch 48 is provided to detain the projection 42 in the closed end portion 40 of the groove portion 38. In this case, the catch 48 takes the form of a thin spring member, made of metal or other suitable resilient material, which projects slightly into the groove 38, adjacent the end thereof. The illustrated catch 48 is tapered in shape and is seated in a tapered socket or slot 50 which is formed in the bar 18 adjacent the groove 38. The catch 48 and the socket 50 are tapered toward the groove 38 to prevent the catch from falling into the groove. The depth of the socket 50 is somewhat greater than the thickness of the catch 48, so that the catch may spring upwardly to permit the projection 42 to pass the catch and enter the closed end 40 of the groove 38.

When the brush 10 is extended, the bristles 12 project in a direction corresponding to the lateral direction in which the bore 20 is offset from the axis of the handle member 16. Thus, the bristles 12 are in an offset position for convenient use in brushing teeth. It will be seen from Fig. 1 that the bristles project well beyond the contour of the hollow handle member 16, so that there will be no substantial possibility that the member 16 will strike the teeth or lips of the user.

When the brush 10 is retracted, the bristles 12 extend in the opposite lateral direction, so that they may be housed compactly in the recess 30. It will be apparent that the bristles are protected from being damaged or soiled by contact with other articles when the brush is carried in a pocket, purse or the like.

Thus, the toothbrush is convenient and serviceable, yet is fully retractable for easy and sanitary carriage in a pocket, purse or the like. It will be apparent that the toothbrush is attractive in appearance, both when extended and when retracted.

The telescopically engageable handle members may readily be molded from suitable plastics, such as nylon, polystyrene or the like. Thus, the brush member may be easily manufactured at extremely low cost.

Various modifications, alternative constructions and equivalents may be employed without depriving from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims.

We claim:

1. In a retractable toothbrush, the combination comprising a bar having a generally cylindrical inner portion and an outer portion offset laterally from said inner portion, said outer portion having a plurality of bristles projecting laterally therefrom in a direction opposite to the direction in which said outer portion is offset, a handle having a longitudinal bore therethrough slidably receiving said inner portion of said bar, said handle having a cavity therein communicating with said bore at one end thereof for receiving said bristles, said cavity being offset laterally from said bore and being of a size corresponding closely to the original bulk of said bristles, said bar having a keyway therein extending longitudinally along the side of said bar opposite from said bristles, a generally semi-circular groove extending substantially half way around said inner portion of said bar and communicating with one end of said keyway, said groove being near the opposite end of said bar from said bristles, said handle having a key element thereon projecting into said bore at a point generally opposite from said cavity, said key element being slidably receivable in said keyway and said groove, said bar being movable into and out of said handle between extended and retracted positions, said bar being substantially fully received within said bore and said bristles being closely received within said cavity with said bar in said retracted position, said handle having bevels flaring from said cavity at the entrance end thereof for aligning said bristles with said cavity and compressing said bristles for easy entrance into said cavity even if said bristles have been spread by use, said key element being received in said keyway opposite said bristles with said bar retracted, a first catch projecting into said bore and engageable with said groove for detaining said bar in said retracted position, said bar being adapted to be extended by sliding said bar outwardly of said bore with said key element traveling along said keyway, said bar being adapted to be locked in its extended position by rotating said bar through substantially one-half revolution with said key element traveling along said groove to the end thereof opposite from said keyway, and a second catch projecting into said groove adjacent said last mentioned end thereof for detaining said key element therein, said bristles extending laterally beyond and clear of said handle for convenient use with said bar locked in its extended position.

2. In a retractable toothbrush, the combination comprising first and second telescopically extensible and retractable handle members, said first handle member having a longitudinal bore therein, said second handle member being slidably received in said bore and having a plurality of bristles projecting laterally in one direction therefrom, said first handle member having a recess therein communicating laterally with said bore at one end thereof for receiving said bristles, one of said members having a track therein with a first portion extending longitudinally therealong and a second portion extending circumferentially generally half way therearound from one end of said first portion, the other of said members having a follower element slidably engaged with said track, said second handle member being movable longitudinally between a retracted position with said second member received within said bore and with said follower engaged with said first portion of said track at the opposite end thereof from said second portion of said track, and a preliminary extended position with said second member moved outwardly of said first member and with said follower element engaged with said second portion of the junction of said first portion and said track, said second handle member thereupon being rotatable through generally one-half turn to an extended and locked position with said follower element traveling along said second portion of said track to the remote end thereof relative to said first portion, a first catch engageable with said second portion of said track for detaining said sec-

ond member in its retracted position, and a second catch projecting into said second portion of said track adjacent said remote end thereof for detaining said follower element therein, said bristles extending laterally beyond and well clear of said first handle member with said second handle member rotated into its extended and locked position.

3. In a retractable toothbrush, the combination comprising a hollow handle having a longitudinal bore therein with the axis of said bore offset from the axis of said handle, a bar slidably and rotatably received in said bore and having a plurality of bristles projecting laterally from the outer end of said bar, said handle having a recess therein communicating with one end of said bore and extending laterally therefrom for receiving said bristles, said bar having a groove therein with a longitudinal portion extending along said bar generally opposite from said bristles and a circumferential portion extending generally half way around the inner end of said bar from the inner end of said longitudinal portion, a follower element on said handle projecting into said bore at a point generally oposite from said recess, said bar being telescopically movable into and out of said bore between extended and retracted positions, said follower element being engaged with said longitudinal portion of said groove with said bar retracted, said follower element being movable along said longitudinal portion of said groove during extension of said bar, said bar being rotatable in its extended position through generally a half turn with said follower element traveling along said circumferential portion of said groove to the remote end thereof relative to said longitudinal portion, and means for detaining said follower element in said remote end of said circumferential portion of said groove to lock said bar in its extended position, said bristles extending laterally beyond and clear of said handle for convenient use with said bar locked in its extended position.

4. In a retractable toothbrush, the combination comprising a hollow handle having a generally longitudinal bore therein, a bar slidably and rotatably received in said bore and having a plurality of bristles projecting laterally from the outer end of said bar, said handle having a recess therein communicating with said bore for receiving said bristles, said bar having a groove therein with a longitudinal portion and a circumferential portion extending generally halfway around the inner end of said bar from the inner end of said longitudinal portion, a follower element on said handle projecting into said bore, said bar being telescopically movable into and out of said bore between extended and retracted positions, said follower element being engaged with the outer end of said longitudinal portion of said groove with said bar retracted, said follower element being movable along said longitudinal portion to the inner end thereof during extension of said bar, said bar being adapted to be locked in its extended position by rotating said bar through generally a half turn with said follower element traveling along said circumferential portion of said groove to the remote end thereof relative to said longitudinal portion, said bristles extending laterally beyond and clear of said handle for convenient use with said bar locked in its extended position, said recess being offset laterally from said bore at the outer end of said handle, said recess being of a size corresponding closely to the original contour of said bristles, said handle having bevels flaring from said recess at the entrance end thereof for alignment of said bristles with said recess and compressing said bristles for easy entrance into said cavity even if said bristles have been spread by use.

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CERTIFICATE OF CORRECTION

Patent No. 2,883,692 April 28, 1959

Philip Kaye et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 69, strike out "the junction of said first portion and" and insert the same before "said second portion" in line 68, same column.

Signed and sealed this 25th day of August 1959.

(SEAL)
Attest:
KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents