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3,193,864

TOOTHBRUSH

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2 Sheets-Sheet 1

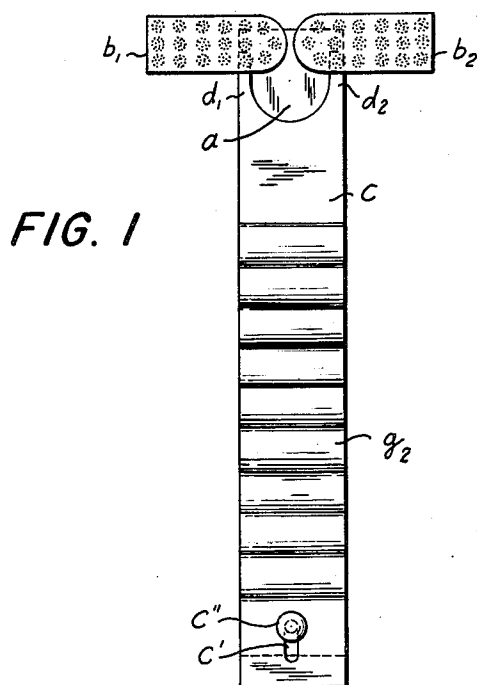


FIG. 1

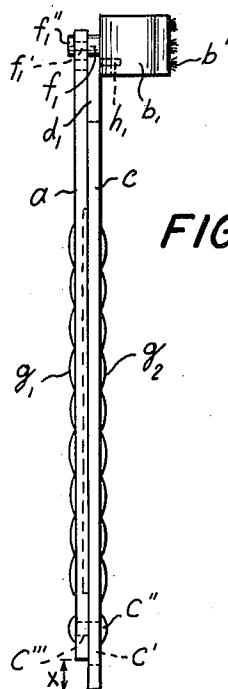


FIG. 2

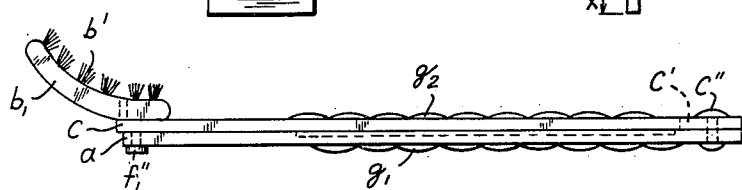


FIG. 4

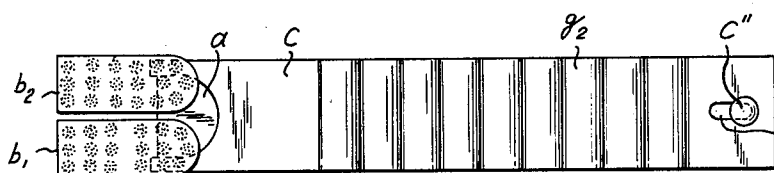


FIG. 5

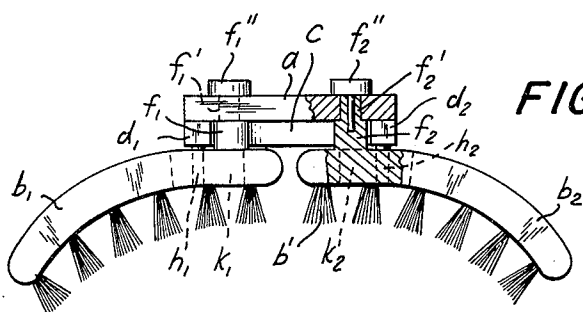


FIG. 3

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FIG. 6

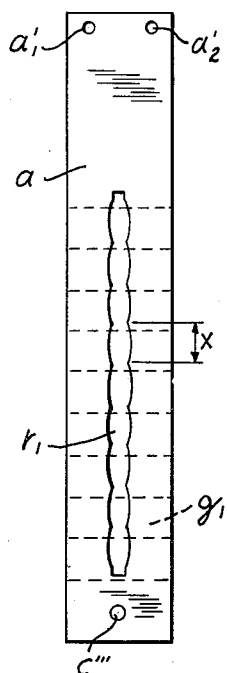


FIG. 7

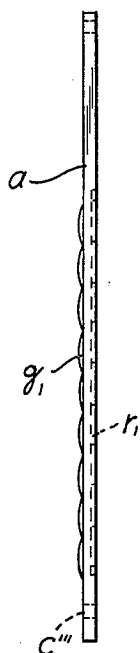


FIG. 8

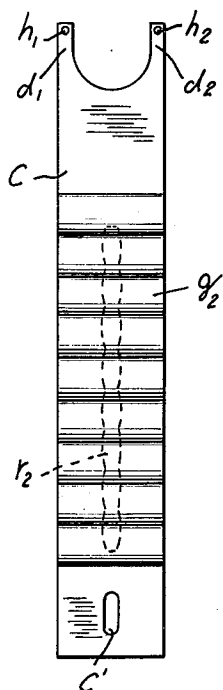


FIG. 9

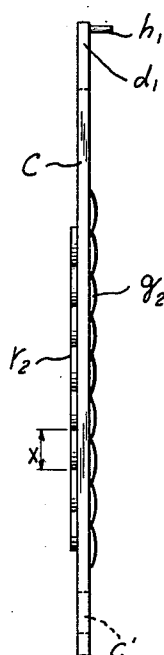
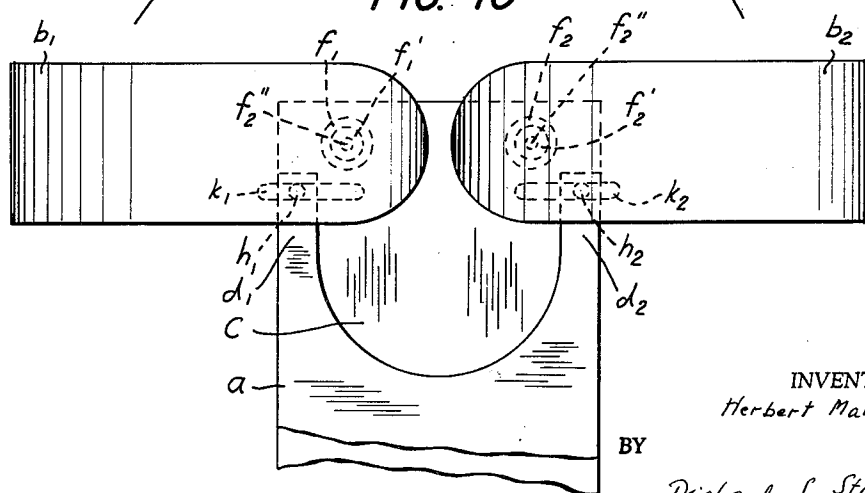


FIG. 10



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TOOTHBRUSH

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M 54,668

10 Claims. (Cl. 15-172)

The present invention concerns a toothbrush.

It is a recognized fact that the most suitable way of brushing teeth is to move a brush, above all, along the outside and inside of the teeth in a direction lengthwise of the teeth i.e. in substantially vertical direction because in this manner not only the recesses between neighboring teeth are most efficiently cleaned but because also in this manner the enamel which is grown in that direction is treated most gently and thus preserved.

However, the advice to brush the teeth in this manner is not always followed because with ordinary toothbrushes it is neither convenient nor very easy to carry out the above mentioned method of brushing.

It is therefore one object of this invention to provide for a toothbrush which not only makes it easy to brush the teeth on the inside and outside in the desired vertical direction but which actually forces the user of the toothbrush to clean the teeth in this preferred manner.

It is another object of this invention to provide for a toothbrush of the type set forth which is adjustable between two positions, one of which is specifically adapted for cleaning the outside of the teeth and the other one specifically designed for cleaning the inside of the teeth.

It is still another object of the invention to provide for such a toothbrush which is comparatively simple of construction and extremely convenient in use.

With the above objects in view the invention includes a toothbrush comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof.

In a more specific aspect the invention includes a toothbrush comprising, in combination, elongated handle means; and oblong brush carrier means mounted in the area of one end of said handle means and extending transversely of the longitudinal direction of said handle means, said brush carrier means being curved in a plane transverse of said longitudinal direction of said handle means and being equipped with a plurality of bristles projecting therefrom substantially in the direction of said plane.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a toothbrush according to the invention, in a first position of the movable parts thereof;

FIG. 2 is a lateral view of the toothbrush according to FIG. 1;

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FIG. 3 is an end view of the brush illustrated by FIGS. 1 and 2;

FIG. 4 is a side view of the brush according to the invention, in a second position of the movable elements thereof;

FIG. 5 is a plan view of the toothbrush in the position illustrated by FIG. 4;

FIG. 6 is a plan view of the handle portion of the toothbrush illustrated by FIGS. 1-5;

FIG. 7 is a lateral view of the handle according to FIG. 6;

FIG. 8 is a plan view of the slide member of the toothbrush according to FIGS. 1-5;

FIG. 9 is a lateral view of the slide member according to FIG. 8; and

FIG. 10 is a diagrammatic illustration at a larger scale of the end portion of the toothbrush according to the invention.

As can be seen from FIGS. 1-3, one embodiment of the invention is a toothbrush which comprises an elongated handle *a* which carries at one end two brush carriers *b*₁ and *b*₂ of oblong shape which extend from the end of the handle *a* in opposite directions transversely of the longitudinal direction of the handle *a* and which are curved as illustrated by FIG. 3 in a plane also transverse of the longitudinal direction of the handle *a*. The bristles *b'* extend from the concave surfaces of the brush carrier members *b*₁ and *b*₂ substantially in the plane of said curvature. Consequently, the entire set of bristles *b'* in the curved arrangement shown by FIG. 3 is particularly well suited for cleaning the outside of the teeth in the front portion of the mouth in the above described preferable manner namely in vertical direction because the brush according to the invention has only to be moved in vertical direction up and down while the curved brushes are in engagement with a substantial number of the teeth simultaneously.

However, in a preferred embodiment of the invention the brush carrier members *b*₁ and *b*₂ are mounted adjustably on the handle *a* so that their position relative to the handle can be changed for the purpose of using, in one position, the brush in the manner described above for cleaning the outside of the teeth, particularly in the front portion of the mouth, and for using the brush, in a second position, for cleaning particularly the inside of the teeth.

The illustrated embodiment comprises a pair of oblong brush carrier members *b*₁ and *b*₂ which are pivoted at the end of the handle *a*. As can be seen best from FIGS. 3 and 6, each of the brush carrier members *b*₁ and *b*₂ is provided with a pivot pin composed of a portion *f*₁ or *f*₂, respectively, of comparatively larger diameter and an extension *f*_{1'} or *f*_{2'}, respectively, of smaller diameter, the last mentioned portion fitting into corresponding bearing holes *a*_{1'} and *a*_{2'}, respectively, provided in the handle member *a*. The above mentioned pivot pins are held in place in the bearing holes by some suitable means e.g. by a small plate *f*_{1''} or *f*_{2''}, respectively, attached to the outer end of the pivot pin.

The brush carrier members *b*₁ and *b*₂ being thus pivotally mounted near the end of the handle *a* can be moved or turned between two positions, namely between a first position as illustrated by FIGS. 4 and 5 in which the two brush carrier members *b*₁ and *b*₂ extend alongside each other in the longitudinal direction of the handle *a*, and a second position illustrated by FIGS. 1-3 in which the two brush carrier members extend from the end of the handle *a* in opposite direction to each other transversely of the longitudinal direction of the handle *a*.

In order to move the brush carrier members between these two positions control means are provided which may consist for example by a slide member *c* as illustrated separately by FIGS. 8 and 9 which is arranged for

being slidably moved along the handle member *a*. There are many ways in which the slide member *c* may be guided for a lengthwise movement along the handle member *a*. One possibility is to provide one of these members with a projecting portion and the other member with a corresponding slot, groove or recess in which the projecting

portion may slide. A projecting rib *r*₂ is shown on the lower side of the slide member *c* and a corresponding slot or groove *r*₁ is shown on the upper face of the handle member *a*. The specific configuration of the portions *r*₁ and *r*₂ will be explained and described further below.

The slide member *c* is superimposed on the handle *a* and terminates at one end thereof in two fork-like arms *d*₁ and *d*₂ which reach into the area outside the bearing holes *a*₁ and *a*₂, respectively, described above. The ends of the arms *d*₁ and *d*₂ carry each a pin *h*₁ and *h*₂, respectively, which are designed to operatively connect the slide member *c* with the brush carrier members *b*₁ and *b*₂, respectively.

This operative connection can be seen more clearly from the FIG. 10. FIG. 10 is actually a plan view exactly as FIG. 1 however for better explanation the brush carrier members *b*₁ and *b*₂ are shown as if they were transparent so that other details of the cooperating parts are recognizable more easily. According to FIG. 10 each of the brush carrier members *b*₁ and *b*₂ is also provided with a groove *k*₁ or *k*₂, respectively, extending in lengthwise direction of the respective oblong brush carrier member. The slot or groove *k*₁ is fitted over the above mentioned pin *h*₁ of the slide member *c* while the slot *k*₂ is similarly fitted over the pin *h*₂. It will be understood that if the slide *c* is moved a certain distance in the lengthwise direction of the handle *a*, the pins *h*₁ and *h*₂ will move the respective brush carrier members, while sliding in the slots *h*₁ and *h*₂, respectively, between the above mentioned two characteristic positions. The amount of movement is predetermined and indicated as *x* in FIG. 2 which shows the slide member *c* moved relative to the handle *a* enough for causing the brush carrier members *b*₁ and *b*₂ to assume the above mentioned second position as illustrated in FIGS. 1-3.

It is easy to understand that the user of the toothbrush can easily control the desired position of the brush carrier members because while holding the toothbrush in his hands he can easily shift with his fingers the slide member *c* lengthwise relative to the handle member *a*. In order to facilitate this operation it may be advisable to provide the outwardly facing surfaces of both or at least one of the handle and slide members with corrugations or serrations *g*₁ and *g*₂, respectively, as illustrated. After the slide member *c* and correspondingly the controlled brush carrier members have been moved to one or the other of the desired positions, the pressure of the fingers or of the hand of the user which is automatically applied between the members *a* and *c* will prevent further relative movement and thus hold the brush carrier members in the particular desired position. However, it may be desirable to provide for some kind of locking or arresting means which would assist in maintaining the moveable members in one or the other achieved relative position. For this purpose either the slide member *c* or the handle member *a* may be provided with at least one projection and the other member with at least two corresponding recesses e.g. in the surfaces of these members which face each other so that said projection, in one position, is in engagement with one of said recesses, and in said position is in engagement with the other one of said recesses. In the preferred embodiment illustrated in the drawing the guide rib *r*₂ is provided with a plurality of wave-like projections and the corresponding slot *r*₁ is provided with corresponding wave-like recesses. The lengthwise dimension of these projections and recesses should be substantially equal to the distance *x* which is the amount of shift necessary for moving the brush carrier members between said first and second position

thereof. Of course, the outer edges of the above mentioned recesses and projections, or both, should be chamfered so that no sharp shoulders are present. Assuming further that at least one of the members *a* and *c* has a certain elasticity so as to be easily bent, it will be understood that upon shifting the slide member *c* relative to the handle member *a* the arresting projection or projections can be shifted from one recess into the other. After such shift the natural pressure exerted by the fingers or by the hand of the user will firmly hold the movable parts of the toothbrush in the desired position.

Under certain circumstances it may be desirable to prevent the outer ends of the member *a* and *c* from moving part unintentionally. For this purpose for instance the handle member *a* may be provided with a small hole *c*^{'''} and the slide member with a slot *c*^{''}. A rivet *c*^{''} or the like placed through the slot *c*^{''} and the hole *c*^{'''} and remaining slidable in the slot *c*^{''} may be used for achieving this result.

As a whole all members of the toothbrush described above may be made in a simple manner from synthetic material, preferably of a type which gives the member a certain amount of elasticity. Such elasticity is even desirable for properly carrying out the cleaning operation by the toothbrush.

It should be noted that the small gap existing between the inner ends of the brush carrier members *b*₁ and *b*₂ as shown in the second position illustrated by FIGS. 1 and 3 is in no way detrimental for the cleaning effect because it is to be expected that the bristles *b*['] near these inner ends will bridge that gap so that it remains entirely unnoticeable and without any disadvantageous effect.

It will be understood that the toothbrush according to the invention as described above by way of example is comparatively very simple in its construction highly efficient through its adjustability and in any case conducive to carrying out the most effective and suitable operation of cleaning the teeth.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of a toothbrush with brush carrier members extending transversely of the handle differing from the types described above.

While the invention has been illustrated and described as embodied in a toothbrush with brush carrier members adjustable between two different positions, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one of said handle means for turning movement relative thereto in mutually opposite directions between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane

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of rotation of said brush carrier means; and slide means operatively connected to said pair of brush carrier means for turning one of said brush carrier means between said first and second positions thereof in a first direction of movement transversely of said longitudinal direction while simultaneously turning the other of said brush carrier means in a second direction of movement opposite said first direction.

2. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means for turning movement relative thereto in mutually opposite directions between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having an end portion operatively connected with said pair of brush carrier means in such a manner that a sliding movement of said slide means along said handle means in one direction causes one brush carrier means of said pair to move from said first position to said second position in a first direction of movement, while simultaneously causing the other one of said pair to move from said first position to said second position in a second direction of movement opposite said first direction, and that a movement of said slide means in opposite direction causes the respective brush carrier means to move from their respective second positions to the respective first positions.

3. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having a forked end portion including two arms, each being operatively connected with a different one of said brush carrier means, each of the latter having a guide portion in sliding engagement with a portion of one of said arms, in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position.

4. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in

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directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having an end portion operatively connected with said pair of brush carrier means in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position, one of said handle and slide means being provided with at least one elongated slot portion and the other one of said handle and slide means being provided with at least one projecting guide portion slidably engaging said slot portion for guiding the sliding movement of said slide means relative to said handle means.

5. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having a forked end portion including two arms, each being operatively connected with a different one of said brush carrier means, each of the latter having a guide portion in sliding engagement with a portion of one of said arms, in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position, one of said handle and slide means being provided with at least one elongated slot portion and the other one of said handle and slide means being provided with at least one projecting guide portion slidably engaging said slot portion for guiding the sliding movement of said slide means selective to said handle means.

6. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated han-

die means and having a forked end portion operatively connected with said pair of brush carrier means in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to turn in opposite directions from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position, said control means including arresting means for disengagedly locking said slide means in place on said handle means when said brush carrier means are moved to either one of said first and second positions, respectively.

7. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having a forked end portion including two arms, each being operatively connected with a different one of said brush carrier means, each of the latter having a guide portion in sliding engagement with a portion of one of said arms, in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position in opposite direction causes said brush carrier means to move from said second position to said first position, said control means including arresting means for disengagedly locking said slide means in place on said handle means when said brush carrier means are moved to either one of said first and second positions, respectively.

8. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having an end portion operatively connected with said pair of brush carrier means in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position, one of said handle and slide means being provided with at least one elongated slot portion and the other one of said handle and slide means being provided with at least one projecting guide portion slidably engaging said slot portion for guiding the sliding movement of said slide

means relative to said handle means, said slot portion and said guide portion having metrically interengaging edges, at least one of said edges of one of said portions being provided with at least one projecting part and at least one of the edges of the other portion being provided with at least two recesses in such a manner that said projecting part engages one of said recesses and arrests said slide means on said handle means when said brush carrier means are moved to said first position, and that said projecting part engages the other one of said recesses and arrests said slide means on said handle means when said brush carrier means are moved to said second position, at least one of said handle and slide means being sufficiently elastic to permit shifting of said projecting part from engagement with one of said recesses to engagement with the other one of said recesses.

9. A toothbrush, comprising, in combination, elongated handle means; a pair of oblong brush carrier means pivotally mounted in the area of one end of said handle means for turning movement relative thereto between a first position in which said oblong brush carrier means extend from said area alongside each other in longitudinal direction of said handle means, and a second position in which said oblong brush carrier means extend from said area in directions opposite to each other and transversely of said longitudinal direction of said handle means, each of said brush carrier means being curved in a plane transverse of the plane of rotation thereof and being equipped with a plurality of bristles projecting therefrom in a direction transverse of the plane of rotation of said brush carrier means; and control means for moving said brush carrier means between said first and second positions thereof, said control means comprising slide means arranged for being manually moved slidably along said elongated handle means and having a forked end portion including two arms, each being operatively connected with a different one of said brush carrier means, each of the latter having a guide portion in sliding engagement with a portion of one of said arms, in such a manner that a sliding movement of said slide means along said handle means in one direction causes said pair of brush carrier means to move from said first position to said second position, and that a movement in opposite direction causes said brush carrier means to move from said second position to said first position, one of said handle and slide means being provided with at least one elongated slot portion and the other one of said handle and slide means being provided with at least one projecting guide portion slidably engaging said slot portion for guiding the sliding movement of said slide means relative to said handle means, said slot portion and said guide portion having metrically interengaging edges, at least one of said edges of one of said portions being provided with at least one projecting part and at least one of the edges of the other portion being provided with at least two recesses in such a manner that said projecting part engages one of said recesses and arrests said slide means on said handle means when said brush carrier means are moved to said first position, and that said projecting part engages the other one of said recesses and arrests said slide means on said handle means when said brush carrier means are moved to said second position, at least one of said handle and slide means being sufficiently elastic to permit shifting of said projecting part from engagement with one of said recesses to engagement with the other one of said recesses.

10. A toothbrush as claimed in claim 3, wherein the outwardly facing surfaces of said handle means and slide means are provided with corrugations for facilitating manual movement of said slide means are provided with corrugations for facilitating manual movement of said slide means relative to said handle means.

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References Cited by the Examiner

UNITED STATES PATENTS

2,084,873 6/37 Strausse ----- 15—167
2,179,402 11/39 Doran ----- 15—167 X
2,263,885 11/41 McGauley ----- 15—167 X

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10

FOREIGN PATENTS

1,230,365 3/60 France.
554,155 7/32 Germany.
590,221 4/59 Italy.

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