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FOLDING TOOTHBRUSH WITH A POSITIVE LATCH

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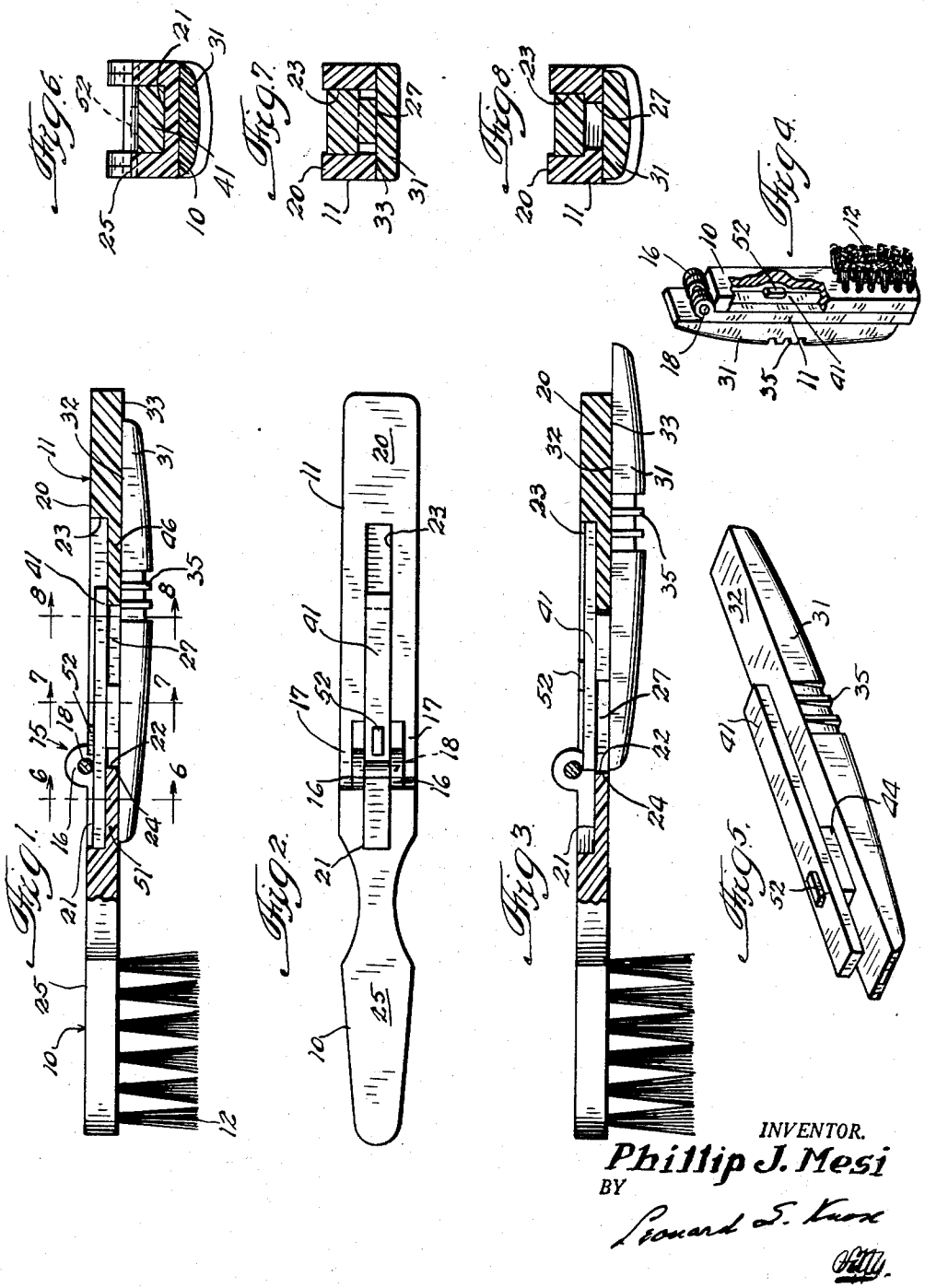

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FOLDING TOOTHBRUSH WITH A POSITIVE LATCH

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This invention relates to folding toothbrushes adapted, when open, to be of the general length of a conventional toothbrush and, when folded, be of sufficiently shorter length to fit compactly into a toilet kit.

In Patent No. 2,503,924, granted April 11, 1950, there is disclosed a folding toothbrush of the character comprehended by this application which, when folded, is received in one side of a kit or receptacle having a compartment for dentifrice.

The present invention relates to improvements in the toothbrush disclosed in said application which substantially reduces the cost of manufacture.

In the said patent the halves of the toothbrush are maintained in open, rigid relation by means of a sliding latch consisting of three parts namely: an actuating pad, a latch bar and a screw uniting the two for joint operation. The instant concept is directed to a one-piece combined actuating pad and latch bar capable of being molded from plastic composition and adapted to be rapidly assembled with the two parts constituting the body of the toothbrush and maintained permanently against accidental dislodgement therefrom, when the parts are in collapsed relation, by utilizing a boss cooperable with the hinge pin connecting the two body parts.

Other objects and advantages will become apparent from the ensuing description which, taken with the accompanying drawing, discloses a preferred mode of carrying the invention into practice.

In this drawing:

Fig. 1 is a combined elevation and partial longitudinal section of a folding toothbrush in accordance with the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a combined elevation and partial longitudinal cross section thereof, with the latch moved to the unlatched position;

Fig. 4 is a reduced perspective view showing the article in folded condition;

Fig. 5 is a perspective detail of the unitary pad and latch;

Figs. 6, 7 and 8 are enlarged cross sections taken on the lines 6—6, 7—7 and 8—8 of Fig. 1.

Broadly regarded the invention relates to a toothbrush having two principal parts, herein termed for convenience of elucidation as a brush part and a handle part which are connected by a hinge to enable the parts to be folded to reduce the overall length of the article. The brush part incorporates groups of bristles of conventional array and attachment. The handle part carries an actuating pad unitary with a latch bar engageable, in one position, with the inwardly disposed extremity of the brush part in order that the two parts may be rigidified while the brush is in use. The actuating pad and latch comprise, with a connecting piece, a unitary assembly, which piece passes through and is guided by an open-ended slot in the inwardly disposed end of the handle part and extending longitudinally thereof. Desirably the latch bar is received in aligned

recesses respectively in the brush and handle parts in order to preserve a flush relation and thereby render the article more convenient to handle. The actuating pad desirably lies on one of the lateral faces of the handle part for ease in manipulation and is convex in exterior aspect to fit the hand. To prevent the unitary pad and latch bar from becoming disassociated from the handle part when the article is folded there is provided a boss abuttable with the hinge means whereby the pad and latch bar assembly is incapable of dislodgment from operative relation.

Adverting to the drawing there is shown a toothbrush comprising two body parts: a brush part **10** and a handle part **11**. One end of the brush part is provided with a plurality of tufts of bristles **12** of conventional construction and arrangement forming no part of the invention per se. The handle part **11** is desirably of elongated, parallelepipedic configuration with rounded corners and edges for obvious reasons. Because of the nature of the article a plastic composition is preferred for the several parts exclusive of the hinge pin and bristles, although these may obviously also be of plastic composition.

At their junction the parts **10** and **11** are articulated by a hinge **15** comprising a pair of ears **16** integral with the brush part **10**, a pair of ears **17** integral with the handle part **11** and a pin **18** tightly fitted in holes in the ears **17**. For reasons which will appear hereinafter the pin **18** occupies a distinct position with respect to the latch bar.

A recess **21** preferably rectangular in transverse cross section, in the inner end of the brush part **10** and opening from one lateral face **25** and from the inner end face **22** thereof, aligns with a recess **23** of transverse cross section corresponding to the recess **21**. Recess **23** opens from one lateral face **20** and from the inner end face **24** of the handle part **11**. A slot **27** opens from the end face **24** of the handle part **11** and desirably has the same width as the recess **23**.

The unitary actuating pad and latch bar is best seen in Fig. 5 and comprises a pad **31** having a flat face **32** juxtaposed to the lateral face **33** of the handle part **11** for sliding contact therewith. Where, in the description and claims I employ the adjective "lateral" I intend to comprehend the side faces of the body of the article in a broad sense, namely the faces **20**, **25** and **33**. For the comfort of the user the outer surfaces of the pad **31** are rounded off as shown (Fig. 5) and a series of ridges **35** is provided to present a friction surface for more convenient manipulation.

The latch bar **41** is desirably of rectangular cross section and, in the collapsed condition of the article, is slidably received in the recess **23**, and, in the operative condition of the article, in both recesses **21** and **23**. The thickness of the bar **41** is such as to allow snug entry thereof between the hinge pin **18** and the floor of the recess **21** whereby in the operative position of the parts the pin **18** serves as a back support for the latch bar and the force thereon, regarded as a cantilever, is thereby materially reduced. In this way the hazard of breakage of the latch bar is substantially eliminated.

Joint movement of the pad **31** and the bar **41** is through a neck portion **44** uniting the same and having flat faces for engagement with the walls of the slot **27**. The width of the neck **44** is such as to provide a sliding fit in the slot, the thickness thereof is slightly greater than that of the wall portion **46** of the handle part exclusive of the recess **23**, for operating clearance, and the length thereof is such, with respect to the length of the slot **27**, as to enable the latch bar to occupy its two extreme positions. It will be understood that the length of the neck **44** will be made a maximum consistent with

the length of the slot **27** in order that the pad **31** and latch **41** will be united by a member of maximum strength.

From the foregoing it will have become apparent that the pad **31** may be shifted longitudinally of the article between two extreme positions to lock and unlock the parts **10** and **11**. The locked, or extended position is seen in Fig. 1 where the latch bar **41** is fully into engagement with the recess **21**. In this position the wall portion **51** of the brush part **10** is clamped, so to speak, between the face **32** of the pad **31** and the inner face of the latch bar **41**. Additional rigidity is contributed by the hinge pin **18** as above described. Concurrently the wall portion **46** of the handle part **11** is clamped, so to speak, between the face **32** of the pad **31** and the inner face of the latch bar. Thus, when the latch is to the left the brush is, for all practical purposes, the full operating equivalent of a conventional toothbrush.

To release the parts **10** and **11** for folding to idle position the pad **31** is actuated to the right (Fig. 3) to withdraw the latch from the recess **21** and from beneath the hinge pin **18** whereafter the parts may be folded to the collapsed condition of Fig. 4.

It will be observed that, when the parts **10** and **11** are folded to the position of Fig. 4, the end of the slot **27** will be exposed and that, in the absence of special provision therefor, the pad and latch assembly of Fig. 5 may be withdrawn or fall out. To obviate such contingency I provide, on the outer surface of the latch bar **41**, an integral boss or pad **52** which may, when the brush and handle parts are folded, engage the hinge pin **18**. Inasmuch as this pin is fastened into position following assembly of the unitary pad and latch bar assembly the latter will thereafter be maintained in operative relation with the handle part **11**.

It will also be noted that the design of the assembly of Fig. 5 is such as to lend the same to molding in plastic composition without the necessity of employing expensive cores or undercuts in the mold.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto since many modifications may be made and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

I claim:

1. In a folding toothbrush which comprises an elongated brush part including an inner end face and bristles secured to a lateral face of the part and an elongated handle part including an inner end face which parts, in the operative relation thereof are aligned with the respective end faces in juxtaposition the improvement comprising; a hinge and latch means for effecting folding of said parts in adjacency and for latching said parts in the unfolded, extended position, said hinge comprising a pair of ears on the brush part adjacent the inner end thereof and a pair of ears on the handle part adjacent the inner end thereof, the said pairs of ears being respectively overlapped and provided with aligned bores receiving a through hinge pin, the brush part and handle part each having a longitudinal recess opening at one end on said inner end faces and opening on coplanar lateral surfaces thereof, said recesses being in alignment, said handle part having a longitudinal slot opening at said inner end face thereof and extending from the floor of said handle part recess to the lateral wall thereof opposite said recess, said latch means including a latch bar slidable in said recesses and having two working faces the inner one of which slides on the floor of said recesses and the outer one of which is adapted, in the latched position of the parts, to engage frictionally under said hinge pin, said latch means also including an actuating button having a face slidable on the respective lateral faces of said brush and handle parts opposite the respective recesses therein and a neck integral with said latch bar and actuating button passing through said slot to unite said bar and button for joint movement, said neck travelling in said slot upon movement of the latch means between latching and unlatching positions.

2. The combination in accordance with claim 1 further characterized by a pad on the latch bar extending outwardly thereof for abutment with said hinge pin upon actuation of the latch bar in the direction of its movement to latching position to prevent inadvertent separation of the same from the handle part when the brush and handle parts are folded so that the brush part is not in a position to limit movement of the latch bar.

3. In a folding toothbrush which comprises an elongated brush part including an inner end face and bristles secured to a lateral face of the part and an elongated handle part including an inner end face which parts, in the operative relation thereof, are aligned with the respective end faces in juxtaposition, the improvement comprising: a hinge and latch means for effecting folding of said parts in adjacency and for latching said parts in the unfolded, extended position, said hinge comprising a pair of ears on the brush part adjacent the inner end thereof and a pair of ears on the handle part adjacent the inner end thereof, the said pairs of ears being respectively overlapped and provided with aligned bores receiving a through hinge pin, said handle part having a longitudinal slot therethrough opening at said inner end face thereof, said latch means including a bar having a face slidable on co-planar faces of said brush and handle parts, said hinge pin being spaced from said co-planar faces an amount substantially equal to the thickness of the latch bar for frictional engagement of said bar between said pin and co-planar faces when the latch bar is moved to latching position, said latch means also including an actuating button having a face slidable on co-planar faces of the brush and handle parts opposite said first co-planar faces and a neck passing through said slot integral with said latch bar and actuating button to unite the same for joint movement, said neck travelling in said slot upon movement of the latch means between latching and unlatching positions.

4. The combination in accordance with claim 3 further characterized by a pad on the latch bar extending outwardly thereof for abutment with said hinge pin upon actuation of the latch bar in the direction of its movement to latching position to prevent inadvertent separation of the same from the handle part when the brush and handle parts are folded so that the brush part is not in a position to limit movement of the latch bar.

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