

April 27, 1943.

T. H. RIDER

2,317,485

BRUSH

Filed April 27, 1940

Fig. 1.

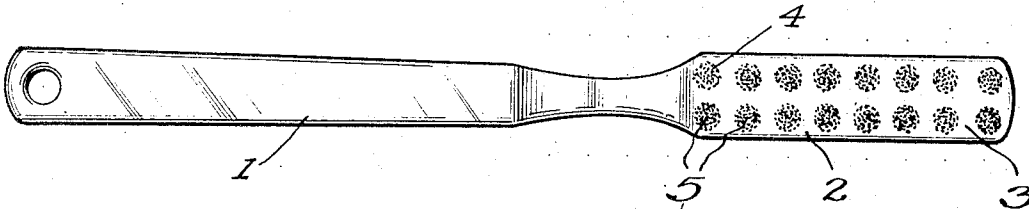


Fig. 2.

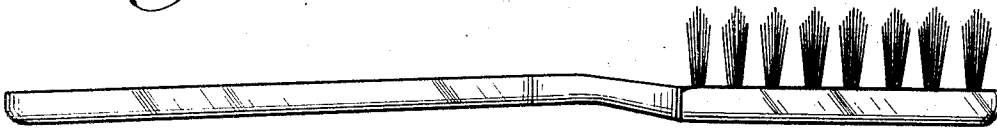


Fig. 5.



Fig. 6.

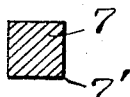


Fig. 7.



Fig. 8.

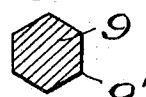


Fig. 9.



Fig. 10.

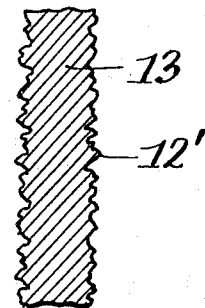


Fig. 11.

Fig. 3.

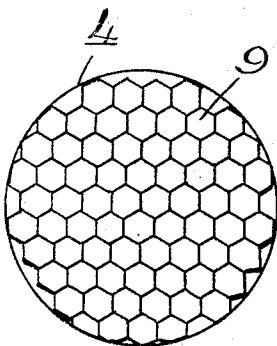
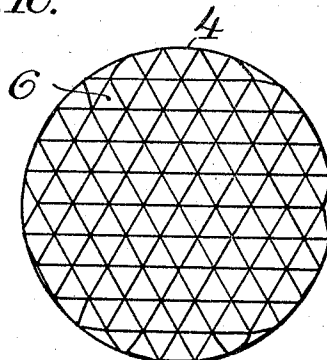


Fig. 4.



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UNITED STATES PATENT OFFICE

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BRUSH

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Application April 27, 1940, Serial No. 331,957

2 Claims. (Cl. 15—167)

This invention relates to improvements in brushes and more particularly to brushes having greater cleaning ability because of the shape and nature of the bristles.

As used in this specification the term bristle is intended to mean preferably a filament of synthetic origin, but including any bristles of natural or other origin having an angular section either in cross-section or longitudinal section. Both synthetic as well as natural bristles as heretofore used in brushes have always been of smooth exterior side surface such as cylindrical, oval or the like, in cross-section. In the present invention I have discovered that by forming the bristles each with an angular section, preferably in cross-section but also including longitudinal section, I am able to provide a brush with greater cleaning ability, as well as to pack the bristles closer together in the tuft receiving hole and thus eliminate much of the interstitial spaces between the adjacent bristles and pack more bristles in a given size hole.

The greater cleansing ability of the bristles of the present invention is due to the more effective scraping action of the angular edges as compared to the smooth surfaces of the type of bristles heretofore known. My improved bristles may be of various cross-sectional shapes, and while I prefer bristles of symmetrical cross-section the invention is not limited thereto but contemplates the use of non-symmetrical cross-sections if desired. Some of the cross-sectional shapes that may be mentioned as included in my invention are triangular, square, pentagonal, hexagonal, heptagonal and octagonal, but other angular shapes may be used as desired.

Also I may use bristles having a roughened surface or surfaces and, as stated, if desired, bristles, either synthetic or natural, having a longitudinally angular section may be used, the types of bristles referred to in the present paragraph giving greater cleansing ability but not being necessarily capable of packing closer together in the hole as would the cross-sectional shapes referred to above. The advantages of the closer packing of the bristles in the hole are important and greatly reduce if not altogether eliminate the undesirable interstices between the bristles heretofore used, thus avoiding the lodgment in said interstices of dirt and undesirable deposits, as well as making possible the use of more bristles in a given size hole and thus producing a greater cleansing action due to the scraping action of the angular edges of the bristles. Bristles such as heretofore used, whether

synthetic or natural, are of substantially round cross-section, thus creating more waste space between the bristles. By the present invention the bristle tufts possess much greater strength, as well as efficiency, than heretofore possible.

My improved brush is of particular value as a tooth brush, as the angular edges of the bristles act very effectively in scraping the dirt from the teeth during the brushing action. I do not wish, however, to be limited to tooth brushes as my invention is capable of use in the many different kinds of brushes to which it is adapted.

Among the objects of my invention, therefore, are to obviate the objections and accomplish the advantages referred to above.

Other objects, advantages and capabilities inherent in my invention will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawing, and while I have shown therein preferred forms, I wish it understood that the same are susceptible of modification and change without departing from the spirit of my invention.

In the drawing:

Fig. 1 is a plan view of a brush embodying my invention and looking toward the tuft-receiving holes, with the tufts removed therefrom.

Fig. 2 is an edge elevation of the brush showing tufts of bristles secured in the holes.

Fig. 3 is an enlarged plan view of a portion of the brush showing a tuft-receiving hole with bristles secured therein of hexagonal cross-section.

Fig. 4 is a view similar to Fig. 3 but showing the hole packed with bristles of triangular cross-section.

Fig. 5 is an enlarged cross-sectional view of a bristle of triangular cross-section.

Fig. 6 is a view similar to Fig. 5 but showing a bristle of square cross-section.

Fig. 7 is a view similar to Fig. 5 but showing a bristle of pentagonal cross-section.

Fig. 8 is a view similar to Fig. 5 but showing a bristle of hexagonal cross-section.

Fig. 9 is a view similar to Fig. 5 but showing a bristle of heptagonal cross-section.

Fig. 10 is an enlarged perspective view of a bristle having a longitudinally angular section.

Fig. 11 is an enlarged fragmentary longitudinal section of a bristle having its exterior surface roughened.

Referring more in detail to the drawing, one form of my brush is shown in Fig. 1 as compris-

ing a handle 1, a body portion 2, with a flattened face 3, in which is formed in any desired arrangement a plurality of tuft receiving holes 4, in each of which holes is tightly packed and secured a tuft 5 of bristles, the tufts being extended over the flat face 3 to any desired extent and in any desired number of longitudinal and transverse rows as desired. Also the tufts may be in irregular arrangement if preferred. As stated earlier herein the bristles of my improved brush may be either of angular cross-section or of longitudinal angular section.

In Fig. 5 is shown a bristle 6 of triangular cross-section. Fig. 6 shows a bristle 7 of square cross-section. Fig. 7 shows a bristle 8 of pentagonal cross-section. Fig. 8 shows a bristle 9 of hexagonal cross-section, while Fig. 9 shows a bristle 10 of heptagonal cross-section.

Fig. 4 shows a portion of the face of the brush in which the opening 4 is packed with closely interfitting bristles 6 of triangular cross-section, while in Fig. 3 the hole 4 has tightly packed therein closely interfitting hexagonal bristles 9. As seen in Figs. 3 and 4, the cross-section of the bristles is such as to enable the bristles to be tightly and closely packed in the hole, thus eliminating to a great degree the presence of any substantial amount of interstitial openings. This enables the packing in the hole of a much greater number of bristles than would be possible without such interfitting between the bristle faces, as well as preventing the formation of interstitial openings to receive deposit and other dirt that would be deposited in such interstitial openings if the cross-section of the bristles were substantially round or oval. This substantial elimination of interstitial spaces between the bristles also gives much greater strength to the bristle tuft.

Fig. 11 shows an enlarged fragmentary portion of a filament having its exterior surface roughened, while Fig. 10 shows an enlarged perspective view of a bristle 11 of octagonal cross-section and also of longitudinal angular section. It will, of course, be understood that the bristle shown in Fig. 10 of angular section in a longitudinal direction may be round or of any other cross-section desired.

When my improved brush is made of synthetic bristles such bristles may be formed in any desired manner by extruding, and at the same time formed of any desired cross-sectional shape. Also, if desired, natural bristles such as hog bristles or other kinds of natural bristles may be treated in any desired manner to produce any desired sectional shapes. Synthetic bristles heretofore known have been of substantially round or substantially oval cross-section, and are of substantially uniform size, which creates a large amount of interstitial spaces which are avoided by the present invention.

Due to the smooth exterior surfaces of bristles heretofore known, such smooth surfaces would slip more readily over the surfaces being cleaned and hence be of correspondingly less cleansing

efficiency. In the present invention the surface being cleaned such, for example, the teeth, during cleansing with the tooth brush will be much more thoroughly and rapidly cleaned due to the scraping action of the angular corners 6', 7', 8', 9', 10' and 11', as shown in each of Figs. 5 to 10, inclusive, it being understood that even though only one angular edge is identified by a reference numeral, each and all of the angular edges shown in the various views will likewise produce a scraping action on the surface being cleaned. Such scraping action will also be produced by the roughened surfaces 12' of the filament 13 shown in Fig. 11, as well as by the additional scraping edges afforded in the case of bristles having longitudinally angular sections such as shown in Fig. 10, either polygonal or round in cross-section, as may be desired.

As stated, my improved brush is of particular value in connection with tooth brushes, but I wish it understood that the same is not limited thereto but is capable of use in many other forms of brushes where a similar cleansing action is desired.

Having now described my invention, I claim:

1. In a brush of the character described, a body portion having formed therein a plurality of tuft-receiving holes, a tuft of synthetic bristles in each hole, each tuft consisting of not less than six single, non-looped bristles each bristle having at least three flat sides; each two meeting sides being angularly disposed whereby to form a plurality of longitudinally extended scraping edges, the flat sides being so constructed and arranged that the bristles are packed together to substantially eliminate interstitial spaces between the bristles and provide a greater number of bristles in a given size hole, each of the bristles being such that regardless of which side of the bristle is presented a flat face of one bristle rests against a flat face of another bristle in their respective hole, said bristles being of such stiffness as to form scraping edges.

2. In a tooth brush, a body portion having formed therein a plurality of tuft-receiving holes, a tuft of bristles in each hole, each tuft consisting of at least six single length bristles in face to face contact with each other in their respective hole, each of said bristles having at least three angularly arranged faces and having a plurality of scraping portions, those portions of the bristles within said holes each having a plurality of contiguous flat faces extending entirely around its perimeter in sequence, said flat faces being so constructed and arranged that the bristles are packed together to substantially eliminate interstitial spaces between the bristles, the bristles being such that every side of those portions within the holes will have a flat face to contact with an adjacent flat face of the adjacent bristle, said bristles being of such stiffness as to effect scraping.

THEODORE H. RIDER.