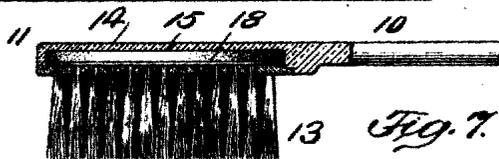
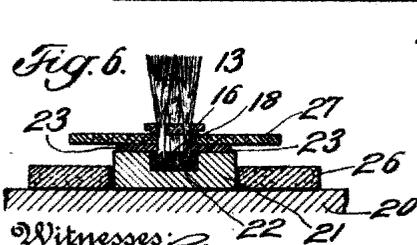
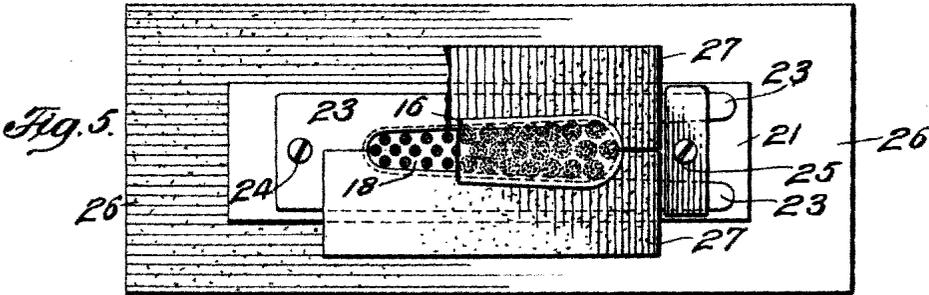
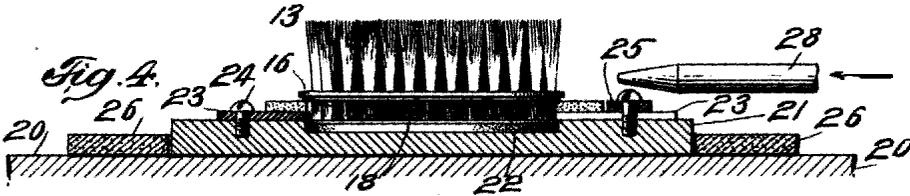
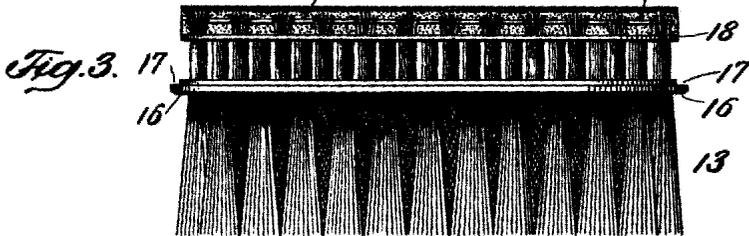
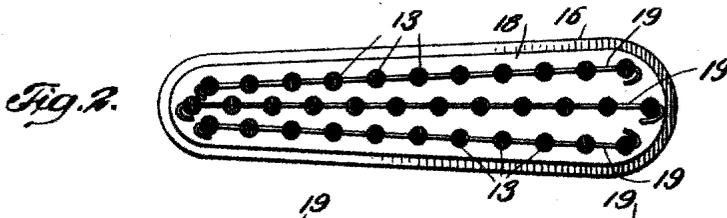
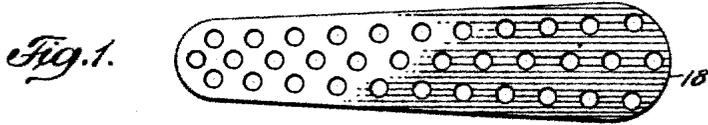


T. F. BARRY.
BRUSH.

APPLICATION FILED DEC. 27, 1911.

1,212,313.

Patented Jan. 16, 1917.



Witnesses:
Julius [Signature]
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UNITED STATES PATENT OFFICE.

THOMAS F. BARRY, OF NEWARK, NEW JERSEY, ASSIGNOR TO RUBBER & CELLULOID HARNESS TRIMMING CO., OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BRUSH.

1,212,313.

Specification of Letters Patent. Patented Jan. 16, 1917.

Application filed December 27, 1911. Serial No. 698,024.

To all whom it may concern:

Be it known that I, THOMAS F. BARRY, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Brushes, of which the following is a specification.

The invention relates to improvements in brushes, particularly toilet brushes such as tooth, nail and hair brushes, and it consists in the novel features, structure and method hereinafter described, and particularly pointed out in the claims.

I present my invention as embodied in the manufacture of tooth brushes, to which it is particularly applicable, although not confined to brushes for cleaning the teeth.

It is highly desirable that the bristles of tooth brushes be so secured that they will not shed or become detached in the mouth, and it is also of importance that the head of the brush be sanitary and of a material and finish adapting it for use in the mouth.

In carrying out my invention, in its preferred form, I construct the head and handle of the brush of pyroxylin material, known in commerce as celluloid and by other names, the head of the brush being made to inclose the inner ends of the knots or tufts of the bristles and a hard rubber composition, which while soft, permeates said ends of the bristles and when hardened or vulcanized securely holds the same. In accordance with my invention I vulcanize the rubber composition on the inner ends or knots of the tufts of the bristles by means of heat prior to the application of said knots or tufts to the main head of the brush. The head portion of the brush is primarily made of an upper section integral with the handle and having a recess in its lower side to receive the entire set of bristles together with the hard vulcanized rubber thereon and a lower section or plate which matches the upper section and engages the lower surfaces of the walls which surround said recess, said lower section or plate having apertures in it through which the tufts of bristles are inserted prior to the application of the rubber composition thereto and being carried by the tufts of bristles during and after the vulcanization of the rubber composition. After the knot ends of the tufts of bristles have had the rubber composition applied thereto and the rubber has

been vulcanized with the aid of heat or otherwise, said ends, with the rubber composition thereon, are applied within the recess in the head of the brush, and thereupon the plate constituting the lower section of the head is slid on the tufts of bristles until it is in engagement with the edges of the upper section of said head, to which edges said lower section or plate is secured by means of celluloid in solution or the like, which causes the upper and lower sections of the head to become integral and results in the formation of a seamless head inclosing the inner ends of the tufts and the hard rubber. The exterior surfaces of the sections of the head and handle of the brush are of a finished or highly polished character, and hence when the lower section of the brush is united with the upper section thereof, the brush is ready for sale or use.

My invention renders it possible to employ pyroxylin material for the handle and head of the brush and a complete set of bristles for the brush having their knot ends firmly secured in a bed of vulcanized hard rubber, the vulcanization being accomplished by means of heat. It has heretofore been deemed to be impossible in the manufacture of a tooth brush or the like having a celluloid head or body, to provide for the use of vulcanized hard rubber for securing the knot ends of the tufts of bristles together and effect such vulcanization by means of heat or on a steam table, owing to the fact that the heat of the table used for vulcanizing rubber is sufficient unless properly guarded against, to prejudicially affect the celluloid.

In accordance with my method of manufacture I arrange the entire set of tufts of bristles for a brush in a suitable plate permanently remaining thereon, said plate usually being of metal having a rubber-coated surface to prevent rust, and apply the rubber composition to the ends of the tufts projecting through the holes in said plate and then vulcanize this rubber on a steam table. The tufts of bristles before being threaded through the metal plate are first threaded through a celluloid plate which is to constitute the lower section of the head of the brush, and this celluloid plate is slid downwardly on the bristles so as to lie beyond the metal plate and in position where it may be protected by asbestos

during the vulcanizing step of the process. After the vulcanization has taken place and the knot of the set of tufts is inserted into the recess in the head of the brush, the said celluloid plate, constituting the lower section of the head, may be pushed or slipped upwardly on the tufts of bristles toward and against the head and be cemented thereto.

The method of manufacturing the brush herein described is the subject of an application for Letters Patent filed by me on July 1, 1911, and bearing Serial Number 636,407.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a top view of a metal or other plate which I permanently apply to the upper ends of the tufts of bristles, said tufts being inserted through openings in said plate to receive the rubber which is to be thereafter vulcanized thereon; Fig. 2 is a top view of the plate represented in Fig. 1, showing the upper ends of the tufts of bristles projected through the same, and the edges of the celluloid plate which constitutes the lower section of the head of the brush; Fig. 3 is a side elevation of the same and shows the rubber composition applied on the ends of the tufts of bristles, said composition being partly broken away so as to disclose some of said ends with the rubber between the same; Fig. 4 is a sectional view of a portion of a steam table and devices applied thereto for enabling the vulcanization of the rubber applied on the knot ends of the tufts of bristles, Fig. 4 illustrating one set of the bristles in process of being vulcanized; Fig. 5 is a top view, partly broken away, of the same; Fig. 6 is a vertical transverse section through the same, and Fig. 7 is a side elevation, partly broken away and partly in section, of the completed brush, the upper and lower sections of the head being united and shown in section, so as to disclose the vulcanized rubber and the metal plate carried on the inner ends of the tufts of bristles and inclosed within the recess formed in said head.

In the drawings, 10 designates the handle of the brush, 11 the head thereof and 13 the series of tufts of bristles, said head being formed of an upper section 14 containing in its lower side a recess 15 and a lower section 16 which is in the form of a plate adapted to close said recess. The handle 10 and head 11 are preferably formed of pyroxylin material or the like. The lower section 16 of the head is formed with a depressed edge 17 which allows a part of the section 16 to project upwardly into the lower edge of the recess 15, while said rim 17 engages the lower edges of the walls surrounding said recess, whereby a rabbet-joint is formed between

the lower edges of the recess 15 and outer edge portions of the plate 16, said joint facilitating the accurate and ready application of the plate 16 and parts assembled with it to the head 11 and the exclusion of moisture from the edge portions of said recess 15. The inner end of the plate 16 sets within a recess formed in the lower face of the head 11, as shown in Fig. 7, and thus said end of said plate is flush with the lower surface of said head.

The process of manufacturing the brush is illustrated more particularly in Figs. 2 to 6 inclusive. In carrying out this process, I thread the tufts of bristles through the lower head section 16, which is apertured to receive the tufts, and also through a plate 18 which is correspondingly apertured and preferably of metal and matches in outline the head section 16 and also the edges of the recess in the head 11. The plate 18 is preferably stamped up from thin sheet metal and has a rubber coating baked on it so as to avoid any danger of said plate rusting, should moisture reach the same during the use of the brush. The tufts of bristles are drawn through the lower head-section 16 and plate 18 by means of wires 19 in a manner familiar to this art. The wires 19 are not, however, relied upon by me as means for securing the bristles in position in the final brush. After the tufts of bristles 13 have been threaded through the openings in the lower head section 16 and plate 18, I see that the plate 18 is properly below the extreme upper ends of the tufts and that the lower head section or plate 16 is properly spaced downwardly from the plate 18, as illustrated in Fig. 3. After the plates 16, 18 and bristles 13 are in the relation in which they are represented in Fig. 3, I first, by hand, invert the assembled body represented in Fig. 3 and dip the projecting knot ends of the tufts of bristles into thin rubber that can get in around and between the bristles and then restore the article to the position in which it is shown in Fig. 3 and allow it to stand for awhile or even over night. I then apply over the knot-ends of the tufts of bristles a thicker rubber solution, and I do this with a brush and until I secure the proper thickness over said knot-ends to constitute the final body of rubber desired for securing the bristles and filling the recess 15 in the head of the brush. After applying the thicker rubber upon the knot-ends of the bristles, I may proceed at once with the vulcanization, but prefer to allow the rubber to stand an hour or more in the air prior to subjecting it to the vulcanization step.

The means for vulcanizing the rubber applied on the knot-ends of the tufts of bristles is shown, in Figs. 4, 5 and 6, in which 20 indicates a portion of a steam table of

ordinary construction, 21 a metal plate placed thereon having a recess or matrix 22 to receive the body of rubber on the knot-ends of the tufts of bristles and hold the same while said rubber is being vulcanized by heat from said table, and 23 a plate removably held on the plate 21 by means of a screw 24 and cross-bar 25 and having an opening between its bifurcated members adapted to closely receive the set of tufts of bristles and engage the edge of the metal plate 18 and thereby hold the body of bristles with the plates 16, 18 thereon in the position in which the same is shown in Figs. 4, 5 and 6. I apply upon the steam table 20 a sheet of asbestos 26 having an opening therein adapted to snugly receive the plate 21, whereby the heat of the table is prevented from affecting anything except the plate 21. It is essential that the lower head section 16, which is of celluloid or the like, shall be protected against the action of heat from the steam table 20, and to accomplish this purpose I provide matching sheets of asbestos 27 between the edges of the head section 16 and the upper surface of the plate 21 and plate 23, said sections 27 being recessed on their facing edges to snugly fit around the body of bristles and below the thin lower encompassing edge of the head section 16, as clearly represented in the drawings. As a further means for preventing the heat from the steam table from injuring the head-section or plate 16, I provide an air nozzle 28 and connect the same with a suitable source of air under the pressure, whereby and with the use of said nozzle, a constant current of air is blown over the then upper surface of said head-section or plate 16, as indicated in Fig. 4. I, therefore, employ the asbestos sheet 26 to prevent as far as possible heat escaping upwardly from the steam table, except at the metal plate 21 requiring the heat, and provide the matching asbestos sheets 27 to extend as far as possible inwardly below the head section 16 and means for directing a current of air over the said section 16, the purpose being to prevent the section 16, which is a reasonably thin sheet of material from becoming prejudicially affected by the heat from the steam table 20.

My invention affords a tooth brush of very desirable character, the bristles being strongly held within the head so that they will not shed when the brush is in use and the head of the brush being smooth, seamless and of sanitary character.

The drawings only illustrate one brush in the process of manufacture, but in actual use a large number of the brushes will be manufactured at the same time, the steam table being large enough to receive a large number of the plates having the matrices or cavities in which the rubber composition is

vulcanized. I prefer to make the head and handle of the brush integral and of pyroxylin material, such as celluloid or the like, and the use of this material forbids the vulcanization by means of heat of the body of rubber on the inner ends of the tufts of bristles while the latter are in the recess of the brush head. My process of manufacture, therefore, enables the vulcanization of the rubber for holding the knot-ends of the bristles by means of heat, and the securing of the vulcanized rubber and inner ends of the tufts of bristles within the brush head, or in other words enables me to obtain all of the benefits of the use of vulcanized hard rubber, vulcanized by heat, for holding the knot-ends of the bristles in a brush-head formed of celluloid or other material which is unable to withstand the action of the heat required for vulcanizing the rubber.

I do not limit my invention to all of the details hereinbefore set forth. For illustration, with much disadvantage the plate 18 may, in making some brushes, be omitted, and likewise with less convenience the brush-head may initially have its recess open at the upper side or top instead of the lower side or bottom thereof, in which event the integral lower side of the brush-head would have the apertures or holes for the tufts of bristles and with the handle would be protected from the heat of the vulcanizing table, and the then upper section of the brush-head would be the same as the plate 18 less the apertures therein.

What I claim as my invention and desire to secure by Letters Patent, is:

1. A brush comprising a handle, a head having therein an interior closed recess conforming generally in outline to the outline of the head, a set of tufts of bristles having their knot-ends extended through one face of the head and into said recess, a metal plate within said recess and through which said knot ends also extend, and a body of hard rubber heat-vulcanized on said knot-ends and confined within said recess and against one side of said plate, said tufts of bristles and body of hard rubber constituting a unit previous to insertion in the head.

2. A brush comprising a handle, a head having therein an interior recess conforming generally in outline to the outline of the head, a set of tufts of bristles having their knot-ends extended into said recess, a metal plate concealed within said recess and through which said knot-ends extend, a body of hard rubber heat-vulcanized on said knot-ends and confined within said recess and against one side of said plate, and a perforated plate at the other side of said metal plate closing one side of said recess and through which said tufts of bristles extend, said head and said perforated plate being

of plastic material and connected in proper relation to each other, and said tufts and body of hard rubber constituting a unit previous to insertion in the head.

- 5 3. A brush comprising a handle and a head integral therewith of plastic material, said head having in its lower side a recess conforming generally to the outline of the head, a perforated plate of plastic material
 10 closing the open side of said recess, a metal plate on said perforated plate and concealed within said recess, a set of tufts of bristles extended at their knot ends through both of

said plates and into said recess, and a body of heat-vulcanized hard rubber on the knot- 15 ends of said tufts and the upper side of said metal plate and concealed within said recess.

Signed at New York city, in the county of New York and State of New York, this 20 23rd day of December A. D. 1911.

THOMAS F. BARRY.

Witnesses:

ARTHUR MARION,
 CHAS. C. GILL.

RUBBERSET

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