

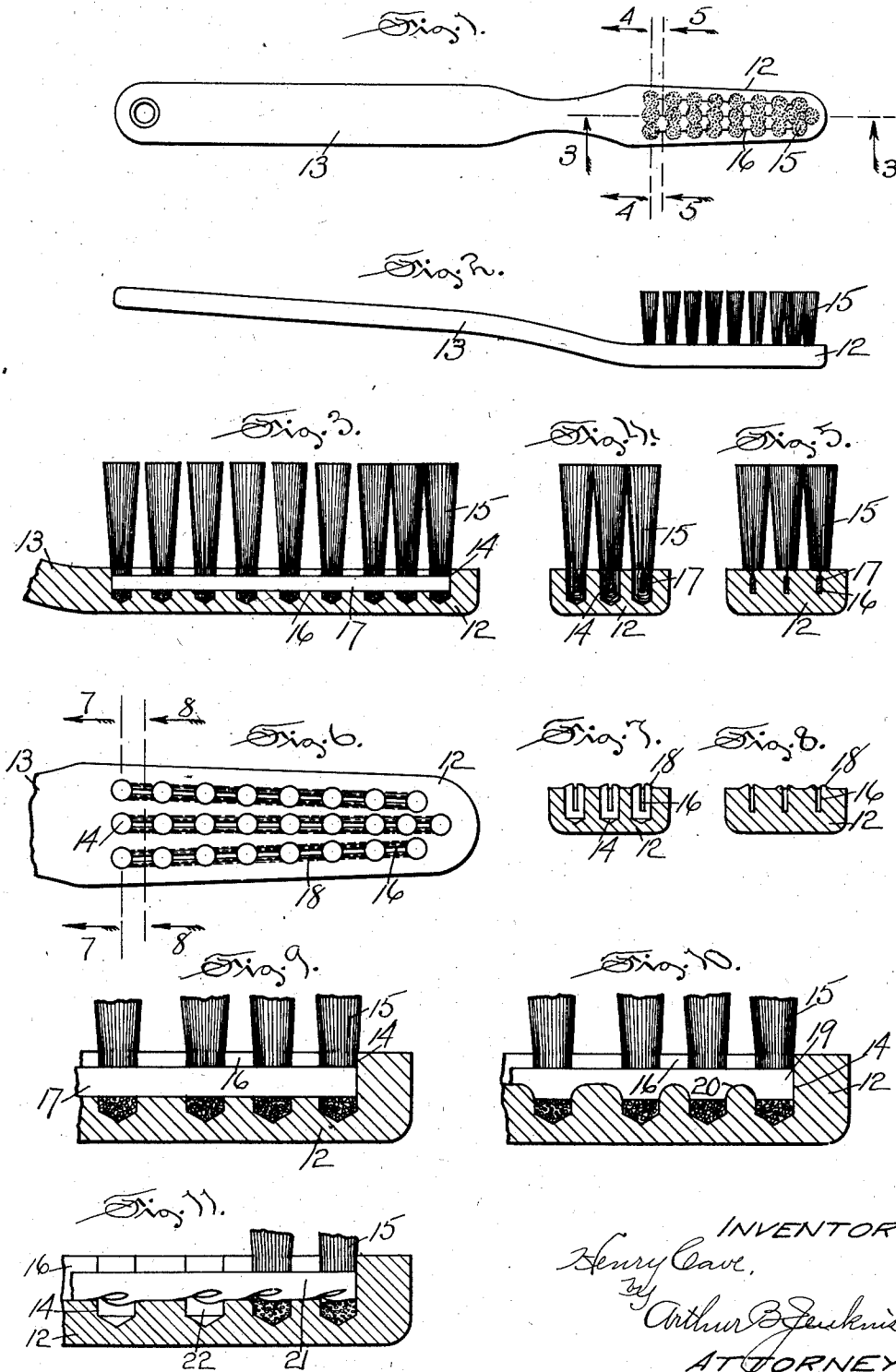
July 7, 1942.

H. CAVE

2,289,313

BRUSH

Filed July 14, 1938



INVENTOR
Henry Cave,
by
Arthur B. Jenkins,
ATTORNEY

UNITED STATES PATENT OFFICE

2,289,313

BRUSH

Henry Cave, Hartford, Conn., assignor to The Fuller Brush Company, Hartford, Conn., a corporation of Connecticut

Application July 14, 1938, Serial No. 219,118

3 Claims. (Cl. 15—199)

My invention relates to the class of articles which are commonly employed for cleaning purposes, and an object of my invention, among others, is the production of an article of this type that may be reduced in dimensions to minimum proportions, that may be manufactured at minimum expense, that shall be extremely durable, and that possesses sanitary qualities.

One form of a brush embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained is illustrated in the accompanying drawing in which—

Figure 1 is a front face view of a brush embodying my invention.

Figure 2 is a side view of the same.

Figure 3 is a view in lengthwise section on enlarged scale through the base or back of the brush.

Figure 4 is a view on enlarged scale in cross-section through the base or back on a plane denoted by the dotted line 4—4 of Fig. 1.

Figure 5 is a similar view on a plane denoted by the dotted line 5—5 of Fig. 1.

Figure 6 is a front face view of the base or back of the brush, the handle being broken off.

Figure 7 is a view in cross-section on a plane denoted by the dotted line 7—7 of Fig. 6.

Figure 8 is a similar view on a plane denoted by the dotted line 8—8 of Fig. 6.

Figure 9 is a sectional view of a fragment of the brush on a further enlarged scale to show construction.

Figure 10 is a similar view illustrating a modified form of my improved brush.

Figure 11 is a detail sectional view illustrating another modification.

While my invention is not limited in its embodiment to any particular form of brush, yet, as it is particularly applicable in the manufacture of tooth brushes, I have selected such an implement for the purpose of illustrating my invention herein. Tooth brushes largely in use at the present time are made from a composition known as cellulose nitrate, the construction of the brushes and the methods of manufacture practically necessitating the use of such material or a similar composition. Owing to its inflammable nature great care must be exercised in its use, particularly during manufacture, and it is therefore one purpose of my invention to employ a composition possessing not only the qualities found in cellulose nitrate, but also having added desirable features, and of a less inflammable character.

I have found by extended experiment that cellulose acetate is a desirable composition to be used in the manufacture of brushes and particularly tooth brushes, but the use of this composition, owing to its texture, prohibits constructions heretofore employed and particularly embodying the use of staples for holding the bristle tufts in place. By the practice of my invention, illustrated and described herein, I am enabled to make a brush of cellulose acetate, such a brush being shown in the drawing herein in which the numeral 12 denotes the head or back of a tooth brush having a handle 13 extending therefrom. Holes 14 are formed in the head extending from the face inwardly. These holes are arranged in sets, the holes of each set extending lengthwise along the head in a straight row, these holes being for the purpose of receiving brush tufts 15 projecting from the holes and comprising the cleaning portion of the brush. Grooves 16 are extended along each row of holes, cutting diametrically through the holes, as shown in Fig. 6 of the drawing. The bottoms of the holes 14 are spaced a slight distance from the back face of the head and the grooves 16 are preferably a little shallower than are the holes, as shown in Figure 3.

The tufts 15 of bristles are formed by doubling the bristles and inserting the doubled portions into the holes in a manner similar to prior constructions. In the place of staples heretofore employed for holding the tufts, I make use of a tuft retainer 17 in the form of a strip or bar, and this may be composed of metal or of composition or other suitable material. This retainer is of a thickness to quite closely fit the grooves 16 and it extends through the folds of the brush tufts from one end of the head to the other. In some cases with a reasonably close fit this retainer will be sufficient to retain the brush tufts in place, but in a preferred form of construction the edges of the grooves 16 are formed over the retainer so that the groove is practically closed or partially so and the retainer is thereby positively held against displacement. Cellulose acetate being of a thermo-plastic nature readily adapts itself to this method of fastening the retainer, as the material may be readily softened by the application of heat and any other substance possessing such characteristics may be employed with good results. In a preferred form of construction ridges 18 are formed on one or both sides of each of the grooves and these ridges are ironed down, as by the application of heat, the material comprising

the head and composed of the thermo-plastic material enabling this to be readily done. In this method of construction the face of the head, after the grooves have been closed, is practically flat, there being no ridges or depressions caused by the formation.

It will be apparent that a number of retainers may be employed for holding the tufts in a single row, although it is preferred to have this retainer composed of a single strip, the main idea being that with a retainer of stiff material a rigid anchor for such tufts is obtained which extends from end to end of each row of bristles.

In the formation of my improved brush the head and handle are made by a molding operation, this including the tuft holes or recesses 14 and the grooves 16. The surface of cellulose acetate is extremely hard, while the interior is somewhat porous and absorbent, not being sufficiently dense to grip and retain staples. It follows that the walls of the grooves and holes in the molded structure are hard enough to prevent penetration of liquids and the production of a highly sanitary brush therefore results.

The use of my improved retainer confines such retainer to a location above or in line with the inner portions of the bends in the brush tufts, with a result that the heads may be made thinner than in cases where staples are employed, in the latter case provision having to be made for a depth of material below the bottom of the recesses or holes in which to secure the staples.

While I have mentioned a thermo-plastic material as cellulose as a preferred composition from which to construct the brush head and handle, it is not my purpose to confine the invention to such, as I contemplate that compositions which are not thermo-plastic may be employed with good results and that various means may be employed for holding the retainer in place.

In that form of the device shown in Fig. 10 a retainer 19 is employed which is formed with notches 20 to provide for an added thickness of the head 12 between the crosswise rows of holes, this imparting an added feature of strength to the head and enabling it to be formed with a minimum distance between its back and the bottoms of the holes 14, thereby imparting lightness to the structure.

In that form of the device shown in Fig. 11 the key or bar 21 has spring fingers 22 on its lower edge, said fingers exerting a yielding pressure upon the fibers 15 so that should any of the fibers become loose for any reason these spring

fingers will always exert a pressure upon the fibers and hold them tight.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

1. A tooth brush comprising a base composed of cellulose acetate in molded form and having a row of holes therein with a groove having unyielding walls extending the full length of said holes and cutting across them, brush tufts doubled within said holes and projecting therefrom, a holding strip within said groove with its upper edge below the surface of said base and extending through the doubled portions of said brush tufts, and lips at the mouths of said grooves, said lips being created by molded portions of the base adjacent the grooves closed together and overlapping said strip and maintaining a smooth surface on said base with a closed joint free from effects of moisture conditions, thereby acting to hold the brush tufts in place.

2. A tooth brush including a base composed of thermo-plastic material of low combustion properties and having holes therein for brush tufts and a groove extending across said holes for brush fastening means, a rib extending along the edge of said groove, brush tufts doubled within said holes and projecting therefrom, fastening means located in said groove and extending through the doubled portions of said tufts, and a closure for the mouth of said groove, said closure being created by molding said rib across said groove to close the groove and maintain a smooth surface on said base with a closed joint free from effects of moisture conditions, thereby acting to hold the brush tufts in place.

3. A brush comprising a base having holes therein for brush tufts, a groove extending across a plurality of said holes, brush tufts doubled within said holes and projecting therefrom, brush fastening members projecting through the doubled portions of each tuft and secured in said grooves, and means underneath said fastening members to yieldingly engage within the doubled portions of said tufts to exert spring pressure thereon.

HENRY CAVE.