

D. L. CHANDLER.
 HOLDER FOR BRISTLES OF BRUSHES.
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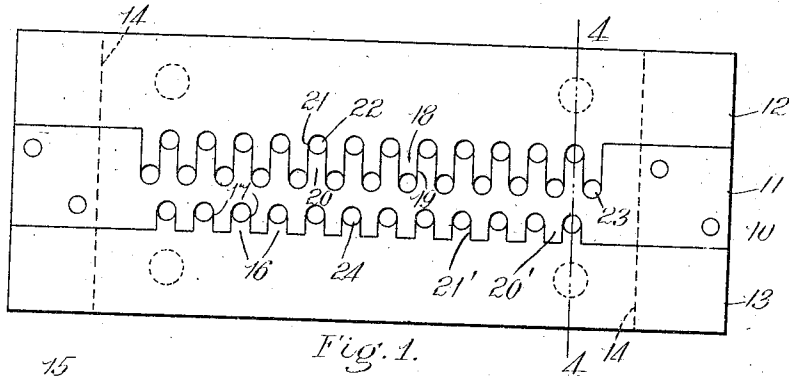


Fig. 1.

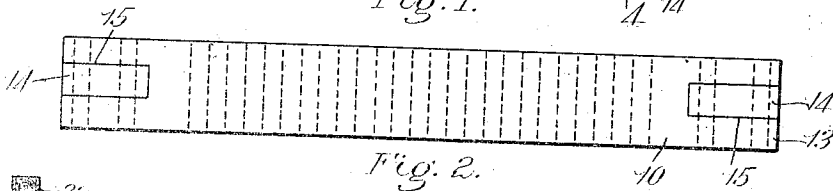


Fig. 2.

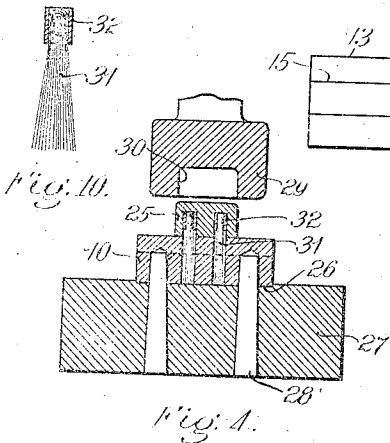


Fig. 3.

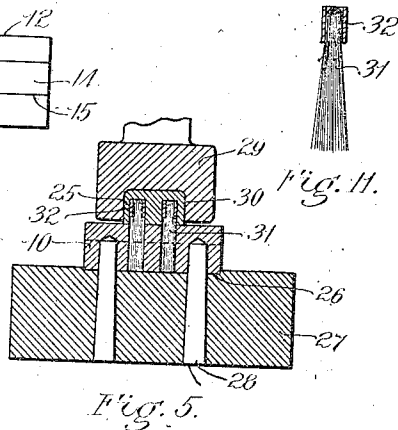


Fig. 4.

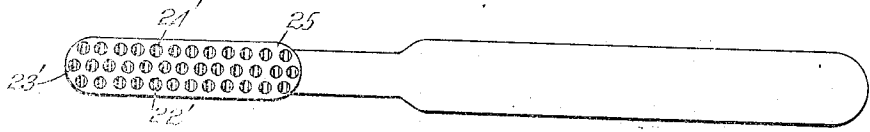


Fig. 5.

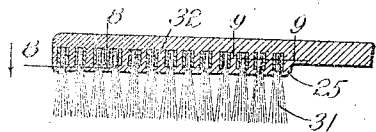


Fig. 6.

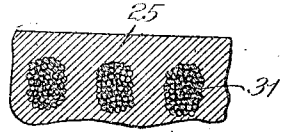


Fig. 7.

Witnesses:
 Franklin E. Low
 Leonard A. Powell

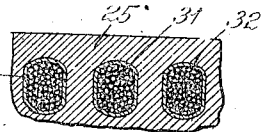


Fig. 8.

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UNITED STATES PATENT OFFICE.

DANIEL L. CHANDLER, OF AYER, MASSACHUSETTS.

HOLDER FOR BRISTLES OF BRUSHES.

1,042,393.

Specification of Letters Patent.

Patented Oct. 29, 1912.

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To all whom it may concern:

Be it known that I, DANIEL L. CHANDLER, a citizen of the United States, residing at Ayer, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Holders for Bristles of Brushes, of which the following is a specification.

This invention relates to an improved mechanism for uniting the bristles of brushes to the back or body portion thereof.

The invention is particularly applicable to tooth brushes and the object of the invention is to manufacture a tooth brush, the bristles of which shall be firmly united to the body portion or back of the brush in such a manner that it will be impossible to pull the bristles out of the brush and also that when subjected to wear the bristles will still remain firmly united to the brush body portion.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a plan view of a holder for the bristles of a brush, shown on an enlarged scale. Fig. 2 is a front elevation of the same, also enlarged. Fig. 3 is an end elevation of the same, also enlarged. Fig. 4 is a sectional elevation illustrating the bristle holder with the bristles therein and the body portion of the brush, together with the forming die, as the parts are located prior to the compressing operation, the section of the holder being taken on line 4—4, Fig. 1. Fig. 5 is a sectional elevation similar to Fig. 4 illustrating the parts in their relative positions after the compressing operation has taken place. Fig. 6 is a plan view of a tooth brush constructed by means of my improved mechanism. Fig. 7 is a longitudinal section of the completed brush, with the handle broken off. Fig. 8 is an enlarged section taken on line 8—8 of Fig. 7 illustrating the manner in which the body portion of the brush extends into and around the bristles of the brush. Fig. 9 is an enlarged section taken on line 9—9 of Fig. 7. Fig. 10 is an enlarged section of a bunch of bristles with binding sleeve in connection therewith be-

fore the latter is compressed. Fig. 11 is a view similar to Fig. 10 after the sleeve is compressed.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is a holder for the bristles of the brush consisting of three parts 11, 12 and 13. The part 11 has two guide plates 14, 14 fast thereto and projecting laterally therefrom on opposite sides, respectively. The parts of said guides which project laterally from the central portion 11 extend into grooves 15, 15 provided in the opposite ends, respectively, of the end parts 12 and 13. The part 13 has projections or fingers 16, 16 which project into corresponding recesses 17, 17 in the central part 11. The part 12 has projections 18, 18 which project into recesses 19, 19 in the part 11 and the part 11 has projections 20 thereon which project into recesses 21 in the part 12, and also projections 20' thereon which project into recesses 21' in the part 13. When the three parts 11, 12 and 13 are drawn closely together, there is a series of holes 22, 22 extending through the holder 10, considered as a whole, and these series of holes extend across the adjacent edges of the parts 11 and 12 and between the ends of said projections 20 and the bottoms of the recesses 21. Another series of holes 23, 23 extend through the holder 10 across the adjacent edges of the parts 11 and 12 and between the ends of the projections 18 and the bottoms of the recesses 19. A series of holes 24 also extend through the holder 10 across the adjacent edges of the parts 11 and 13 between the ends of the projections 16 and the bottoms of the recesses 17. Thus there are three series of holes 22, 23 and 24 which extend through the holder 10 and these three series of holes correspond in relative position with the series of holes 22', 23' and 24' provided in the body portion 25 of the brush (Fig. 6). It will be understood that the holes 22', 23' and 24' extend preferably only partly through the back or body portion of the brush.

When in position for the forming operation, as in Fig. 4, the under side of the holder 10 is placed in a recess 26 provided in the base 27 and the same is further held

in position during the forming operation by tapered pins 28, 28 which are fast to the base 27 and project upwardly in holes provided therefor in the holder 10.

29 is a forming die provided with a recess 30, in width substantially equal to the width of the body portion 25 of the brush.

The general operation of the mechanism hereinbefore specifically described and the process of manufacture of the brush is as follows: The bristles 31 of the brush are taken in bunches and doubled back upon themselves, and each bunch of bristles is then inserted, doubled end first, through a metal sleeve 32, as in Fig. 10. The sleeve 32 is then compressed or pinched laterally thereof upon the bunch of bristles therein inclosed, as illustrated in Fig. 11. The bunches of bristles are then inserted, doubled end first, with their encircling sleeves, in the holes in the bristle holder 10, with the doubled ends and their encircling sleeves projecting beyond or outside said bristle holder, as illustrated in Fig. 4. Adhesive material is then preferably applied to the doubled projecting ends of the bunches of bristles. The body portion of the brush, which is preferably formed of celluloid or other material which, upon being heated, becomes plastic, is then placed upon the holder 10, with the doubled ends of the bristles and their encircling sleeves projecting into the series of holes 22', 23' and 24' in the body portion of said brush.

The next step in the operation of manufacture is to bring the forming die 29 downwardly against the body portion 25 of the brush, it being understood that during this forming operation the die 29 is heated. When this forming die is brought down against the body portion of the brush, as illustrated in Fig. 5, the heat of the forming die 29 softens the body portion of the brush and forces the material of which said body portion is formed into all the interstices and spaces between and around those portions of the bunches of bristles which project into said body portion and around their encircling sleeves, so that the integral portions of the body portion of the brush are forced into and around the bunches of bristles and their encircling sleeves. The forming die 29 is then raised and after the body portion of the brush has cooled, it is removed from the holder 10, which can be easily done by sliding the parts 12 and 13 along the guides 14, 14 and away from the central portion 11 of said bristle holder.

The brush thus manufactured as hereinbefore described has a series of bunches of bristles extending into the back portion of the brush and locked therein by integral portions of said back portion, these bunches of bristles being inclosed by a metal sleeve which is entirely surrounded by said back

portion of the brush both at the sides and ends of said sleeve, as will be seen by reference to Figs. 5, 7 and 9.

It will be understood that the holes 22', 23' and 24' after the molding operation hereinbefore described, are completely filled and sealed by the bristles and by integral parts of the body portion of the brush, which integral parts are forced into said holes while plastic and during the molding operation, and these integral parts, it will be understood, are forced into the interstices between the bristles of the brush into and around the metal sleeve encircling the bristles of the brush and from opposite ends of said metal sleeves, so that in the finished brush there will be absolutely no holes in the body portion of the brush into which foreign matter can penetrate, and thus the brush is rendered perfectly hygienic, as well as durable, while the bristles and their encircling sleeves are firmly locked to the body portion of the brush by integral parts of said body portion, as hereinbefore set forth, so that the bristles cannot be pulled out of the body portion of the brush.

Having thus described my invention, what I claim and desire by Letters Patent to secure is:

1. A holder for the bristles of a brush consisting of a plurality of parts located side by side, one of said parts having a series of recesses formed in the opposite sides thereof, and terminating in semi-cylindrical grooves, the material intervening between, and constituting the walls of said recesses upon one side of said part also terminating in semi-cylindrical grooves, a second one of said parts having a series of projections terminating in semi-cylindrical grooves, said projections constituting the walls of recesses which terminate in semi-cylindrical grooves, said projections and recesses in said second part being adapted to engage the recesses and projections respectively of said first part and forming thereby a parallel series of cylindrical holes, and a third part having projections terminating in semi-cylindrical grooves, said projections adapted to engage the recesses in the opposite side of said first mentioned part and forming thereby a third series of cylindrical holes parallel with said other series, all of said cylindrical holes extending through said holder transversely of the adjacent edges of said parts.

2. A holder for the bristles of a brush consisting of a plurality of parts located side by side, one of said parts having a series of recesses formed in the opposite sides thereof, and terminating in semi-cylindrical grooves, the material intervening between, and constituting the walls of said recesses upon one side of said part also terminating in semi-cylindrical grooves, a sec-

ond one of said parts having a series of projections terminating in semi-cylindrical grooves, said projections constituting the walls of recesses which terminate in semi-cylindrical grooves, said projections and recesses in said second part being adapted to engage the recesses and projections respectively of said first part and forming thereby a parallel series of cylindrical holes, a third part having projections terminating in semi-cylindrical grooves, said projections adapted to engage the recesses in the opposite side of said first mentioned part and forming thereby a third series of cylindrical holes parallel with said other series, all of said cylindrical holes extending through said holder transversely of the adjacent edges of said parts, and means to clamp said plurality of parts together.

3. A holder for the bristles of a brush consisting of a plurality of parts located side by side, one of said parts having a series of recesses formed in the opposite sides thereof, and terminating in semi-cylindrical grooves, the material intervening between, and constituting the walls of said recesses upon one side of said part also terminating in semi-cylindrical grooves, a sec-

ond one of said parts having a series of projections terminating in semi-cylindrical grooves, said projections constituting the walls of recesses which terminate in semi-cylindrical grooves, said projections and recesses in said second part being adapted to engage the recesses and projections respectively of said first part and forming thereby a parallel series of cylindrical holes, a third part having projections terminating in semi-cylindrical grooves, said projections adapted to engage the recesses in the opposite side of said first mentioned part and forming thereby a third series of cylindrical holes parallel with said other series, all of said cylindrical holes extending through said holder transversely of the adjacent edges of said parts, means adapted to align the faces of said several parts, and means to clamp said plurality of parts together.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DANIEL L. CHANDLER.

Witnesses:

LOUIS A. JONES,
SYDNEY E. TAFT.