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TOOTHBRUSH

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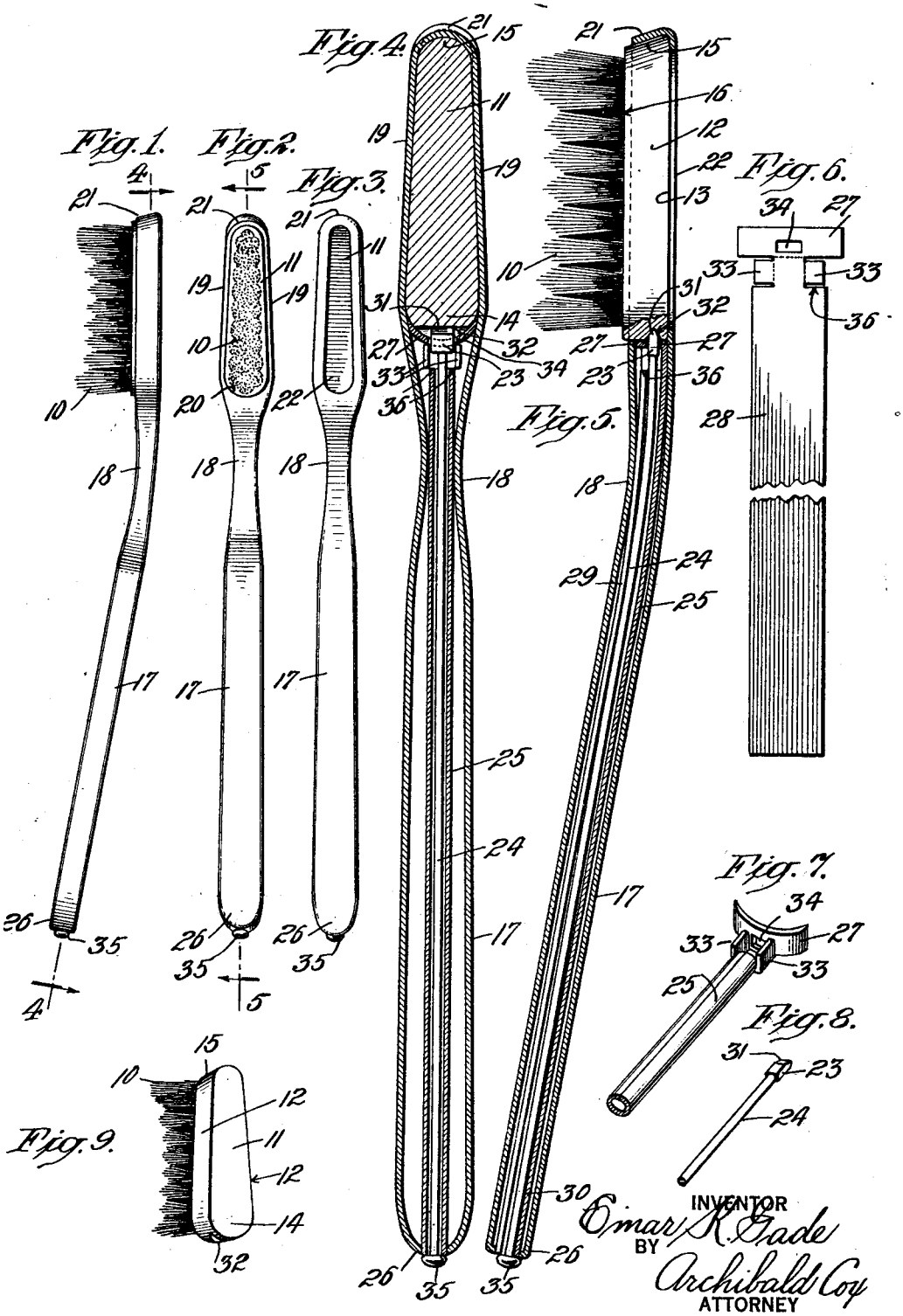

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# UNITED STATES PATENT OFFICE.

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## TOOTHBRUSH.

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The invention relates to an improvement in brushes, and more particularly to an improvement in toothbrushes of the type in which the bristles are detachably secured to the handle so that they may be removed for cleansing or for replacement by new bristles. One object of the invention is to produce a toothbrush of this type in which the bristle carrying head will be rigidly secured in the handle by improved and simplified means, efficient and durable in operation and inexpensive to manufacture. Another object of the invention is to arrange the parts of the means for securing the bristles to the handle in such manner that the brush will have substantially the appearance of one in which the bristles are permanently connected with the handle part of the brush, thereby improving upon the appearance and adding to the attractiveness of brushes of this type. To the accomplishment of these objects the invention consists in the improved brush hereinafter fully described and particularly pointed out in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Fig. 1 is a side elevation of a toothbrush constructed according to the principle of the invention; Fig. 2 is a bottom plan of the brush shown in Fig. 1; Fig. 3 is a top plan thereof; Fig. 4 is an enlarged section taken along the line 4—4 of Fig. 1; Fig. 5 is a similar section taken along the line 5—5 of Fig. 2; Fig. 6 is a plan of the blank of sheet metal from which the tube for holding the movable rod is formed; Fig. 7 is a perspective view, with the rear end broken away, of the movable rod holding tube; Fig. 8 is a perspective view of the forward end of the movable rod; and Fig. 9 is a perspective view of the bristle carrying head separated from the handle.

The improved toothbrush as illustrated in the drawings comprises the bristles 10 inserted into a base portion or head 11 in the usual manner. The base portion or head for holding the bristles 10 may be composed of any suitable material such as rubber, celluloid, or the like. The side walls 12 of the head 11 rise at right angles from the back 13 of the head and converge slightly from the rear end 14 to the front end 15 thereof. The rear end 14 of the head is rounded or arc-shaped and rises perpendicularly from the back 13. The front end 15 of the head 12 is rounded and the extremity thereof slants inwardly toward the top surface 16 of the head. The top wall or surface 16 and the bottom or rear wall 13 of the head 12 are preferably parallel with each other.

The handle portion 17 of the brush is a hollow member curved inwardly slightly at the point 18, as is the fashion at present in toothbrushes, and the forward end of the handle is provided with a recess adapted to receive the head 12 snugly, the handle having means, as will be presently described, for rigidly securing the head 12 within the recess. The handle 17 may be composed of metal such as gold or silver, or may be formed from any other material suitable for the purpose. The side walls 19 of the forward end of the handle constitute the sides of the recess and they converge from their rear end 20 to the forward extremity 21 of the handle conformable to the convergence of the side walls of the head 12. The front and rear ends 20 and 21 of the recess are rounded to conform to and receive snugly the rounded front and rear ends of the head 12. The side walls 19 and rear end wall 20 of the recess formed in the handle rise perpendicularly from the back wall 22 thereof to properly engage the side walls and rear end of the head 12. The forward extremity 21 of the handle is inclined inwardly at the same angle as the forward end 15 of the head 12 so that when the head is in the recess the end 21 of the handle will overlap and thereby securely hold the forward end of the head in place.

The means for detachably holding the head 12 in the recess in the forward end of the handle comprises a block 23 carried by the forward end of a rod 24 mounted within a tube 25 enclosed in the hollow handle 17 and extending from the rear extremity 26 thereof to the rear end of the head receiving recess. On the forward end of the tube 25 is formed an arc-shaped piece 27 which constitutes the rear wall 20 of the recess. The tube 25 is struck up or swaged in a well known manner from the blank shown in Fig. 6. Inasmuch as the handle 17 is bent at the point 18 and the tube 25 substantially fills the interior of the contracted portion of the handle 17 at the point 18 the tube 25 is also bent at this point, as clearly appears in Fig. 5. The reason for this is to cause the inner surfaces of the walls of the tube 25 to frictionally engage the rod 24 and thereby prevent it from moving longitudinally in either direction in the handle 17 when not purposely moved by the user of the brush in detaching the bristle head 12 and

securing a new one to the handle. It will be seen by inspecting Fig. 5 that the inner surfaces of the walls of the tube 25 engage with the rod 24 at about the points 29 and 30. This frictional engagement is great enough to prevent the accidental movement of the rod 24 but is not sufficient to inconvenience the user in pulling the rod outwardly to disengage the bristle head or push it inwardly to secure the bristle head in the recess.

The block 23 is rectangular in cross-section and is provided on its forward extremity with a wedged-shaped holding point 31 adapted to enter and closely fit a V-shaped notch 32 formed transversely in the rear end 14 of the bristle head 12. The notch 32 lies parallel with the rear or bottom surface 13 of the head, and the block 23 is held in the tube in such fashion that the flat tapering under surface of the wedge point 31 lies on the flat tapering bottom surface of the notch 32, thereby establishing a cam action between these parts which effectively forces the bottom or rear surface 13 of the head against the bottom surface of the head receiving recess in the handle. To prevent the rod 24 from rotation the block 23 travels lonigtudinally in a rectangular piece constituted by the flanges 33 struck up from that portion of the tube blank between the piece 27 and the part from which the tube proper is formed, as indicated in Fig. 6. In the piece 27 is formed a rectangular aperture 34 through which the block 23 passes. The rear end of the rod 24 projects beyond the rear end of the tube 25 and handle 17 and is formed as a button or knob 35 by manipulating which the user may draw the rod outwardly to disengage the block 23 from the notch 32 when the bristle head is to be removed and push the rod inwardly to force the block 23 into the notch 32 of the new bristle head to hold it firmly in the recess. The rear end of the block 23 is adapted to engage with the forward end 36 of the tube proper 25 and thereby limit the extent of outward movement of the rod.

It will be recognized that in the above described detachable bristle head toothbrush the means for detachably securing the bristle head to the handle are simple in construction and accordingly inexpensive to manufacture and that the frictional engagement of the tube 25 with the rod 24 furnishes an efficient means for holding the block 23 in engagement with the sides of the notch 32. The life of these parts is substantially without limit, the wear of 24 and 25 due to the infrequent moving of the rod 24 being negligible, or substantially so. The overhanging end 21 of the handle against which the rod 24 forces the forward end of the head 12 acting in conjunction with the block 23 and notch 32 holds the head 12 firmly in its recess. The head 12 will be of such size as to fit snugly within the recess in the handle. And when the whole brush is assembled as shown in Fig. 1 it has all the appearance and attractiveness of a toothbrush in which the bristle part is inseparably connected with the handle part.

Having thus described the inventon what I claim as new is:—

1. A brush comprising, a hollow handle having a bent portion and provided at its forward end with a bristle head receiving recess, a bristle head adapted to be received within and to fit snugly the recess in the handle, said head having at its rear end a notch, a tube received within the hollow handle and bending in conformity therewith, a rod slidingly received within the tube and frictionally engaged thereby, and a block carried on the forward end of said rod adapted to enter the notch in the head to secure the head in the recess, the frictional engagement of the tube with the rod being sufficient to prevent the rod from accidental displacement.

2. A brush comprising, a hollow handle having at its forward end a bristle head receiving recess, a bristle head received within the recess and having on its rear end a notch, a tube received within the handle, the forward end of the tube carrying a piece constituting the rear end of the recess, said piece being provided with an aperture, a rod received within the tube and having on its forward end a block adapted to pass through the aperture in the tube piece for engagement with the notch in the bristle head to hold the latter in place, a portion of said tube being offset to engage with and frictionally hold the rod against accidental displacement but permitting manual movement thereof.

3. A brush comprising, a hollow handle having at one end a bristle head recess, a bristle head adapted to be received within the recess and having on its rear end a notch, a tube received within the recess, a rod slidingly received within the tube, a block of non-circular cross-section mounted on the forward end of the rod and adapted to enter the notch in the bristle head to hold it in the recess in the handle, the tube being provided with a part arranged to engage the block to prevent it from rotation, the tube being offset to engage with the rod and thereby to exert a frictional pressure upon the rod to prevent it from accidental displacement but permitting manual manipulation thereof.

4. A brush comprising, a hollow handle having on its forward end a bristle head receiving recess, the sides of the recess rising perpendicularly from the bottom of the recess and converging toward the front end of the handle, the front end of the recess being rounded and slanting inwardly from the bottom thereof, the rear end of the recess being rounded and rising perpendicularly from the bottom thereof, a bristle carrying

head of contour permitting it to be received in and fit snugly the recess in the handle and having on its rear end a transverse V-shaped notch, a rod slidingly received within the handle, a block carried on the forward end of the rod and having a transverse wedge end adapted to fit and exert a cam action on the bottom surface of the notch in the head to hold the head in the recess, means for preventing the rod from rotating, said handle frictionally engaging the rod to prevent it from accidental displacement.

5. A brush comprising, a hollow handle having a bent portion, and provided at its forward end with a bristle head receiving recess, a bristle head adapted to be received within the recess and to substantially fill it, the forward wall of the recess and the forward end of the bristle head having inclined parts arranged to hold the forward end of the bristle head in the recess, and the rear end of the head having a transverse notch, and means for engaging the notch to hold the rear end of the bristle head in the recess consisting of a block non-circular in cross-section and having a transverse wedge-shaped forward end adapted to enter the notch and thereby press the rear end of the head toward the bottom of the recess, a rod on which the block is mounted longitudinally received within the hollow handle and having a knob at the extremity thereof by which the rod may be manipulated to move the block into and out of engagement with the notch, means for preventing the rod from rotating, and means received within the handle and bent therewith for exerting friction on the rod to prevent the accidental displacement thereof but permitting it to be manipulated manually, said means constituting a stop limiting the outward movement of the rod.

6. A brush comprising, a hollow handle having a bent portion and provided on its forward end with a bristle head receiving recess, a bristle head adapted to be received within and snugly fit the recess in the handle, the forward end of the head and the forward wall of the recess having cooperating parts arranged to hold the forward end of the head in the recess and the rear end of the head being provided with a transverse V-shaped slot parallel with the top and bottom surfaces of the head, a tube received within the handle and extending throughout the length thereof and bending in conformity therewith, the forward end of the tube carrying a perpendicularly arranged piece constituting the rear end of the recess, said piece being provided with an aperture, a block of non-circular cross-section adapted to pass through the aperture and having a wedge-shaped forward end adapted to enter the notch in the head to exert a cam action thereon to hold the head in the recess, a rod on which the block is mounted slidingly and frictionally held in the tube and bending in conformity therewith and extending at its rear end beyond the tube to form a button by which the rod may be manipulated, means on the tube for engaging the block to prevent the rod from rotating, said frictional engagement between the tube and the rod preventing the rod from accidental displacement but permitting manual manipulation thereof.

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