

No. 713,683.

Patented Nov. 18, 1902.

H. POLING.
TOOTH BRUSH.

(Application filed May 20, 1902.)

(No Model.)

Fig. 1

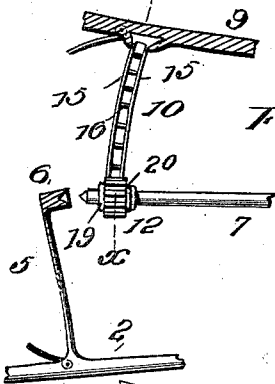
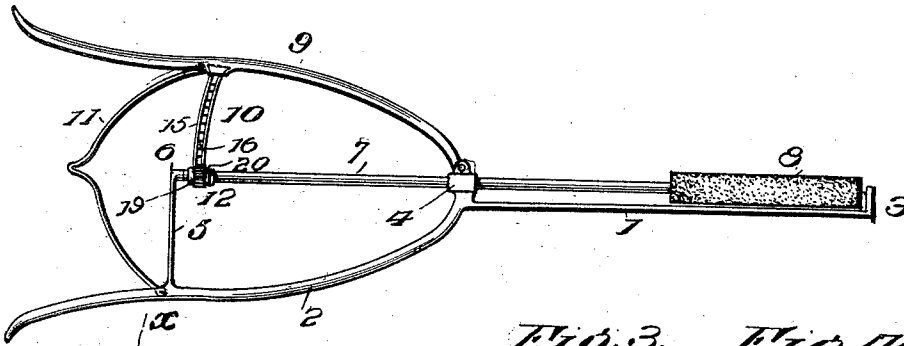


Fig. 2

Fig. 3

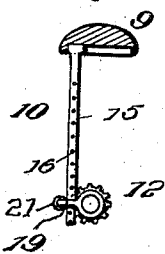


Fig. 4

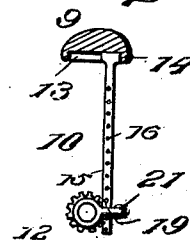


Fig. 5

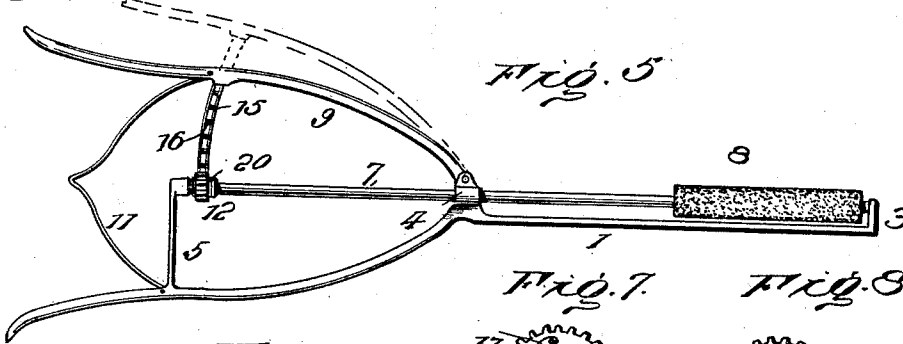
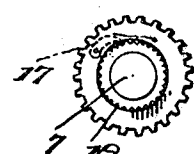
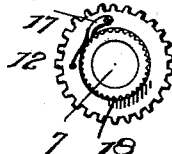
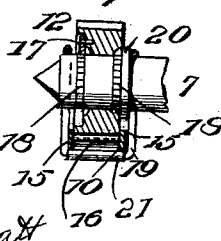


Fig. 7

Fig. 8

Fig. 6



Witnesses

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UNITED STATES PATENT OFFICE.

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TOOTH-BRUSH.

SPECIFICATION forming part of Letters Patent No. 713,683, dated November 18, 1902.

Application filed May 20, 1902. Serial No. 108,235. (No model.)

To all whom it may concern:

Be it known that I, HOMER POLING, a citizen of the United States, residing at Curtin, in the county of Nicholas and State of West Virginia, have invented certain new and useful Improvements in Tooth-Brushes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to

which it appertains to make and use the same. This invention belongs to brushes of the rotary type, and designed most especially for cleansing the teeth, the purpose being the provision of novel means to admit of rotating the brush in one or the other direction, according to the part being acted upon, so as to prevent separation of the gum from the teeth, this being of special importance in tooth-brushes.

The rotary motion is imparted to the brush from the handles, one of which is pivoted and adapted to be oscillated. A rack and pinion are the means for transmitting and converting the oscillatory motion of the handle into a rotary motion of the brush. The pinion has a ratchet connection with the shaft carrying the brush, so as to rotate it in one direction only, and is reversible to admit of rotating the brush in an opposite direction when required. The same result is attained—*i. e.*, reversing the rotation of the brush—by shifting the rack-bar so as to engage with the opposite side of the pinion.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a rotary brush and mountings embodying the invention. Fig. 2 is a detail view of a portion of the handles, showing the spring-standard for the rear end of the shaft sprung from a normal posi-

tion to admit of removal of the pinion for reversal thereof or other purpose. Fig. 3 is a transverse section of the pivoted handle about on the line X X of Fig. 2, showing one position of the rack-bar. Fig. 4 is a view similar to Fig. 3, showing the rack-bar shifted from the opposite side of the pinion. Fig. 5 is a view similar to Fig. 1, showing the reverse position of the rack-bar, the dotted lines indicating the position of the pivoted handle when moved outward to permit the rack-bar clearing the pinion preliminary to being shifted from one side to the other. Fig. 6 is a detail view of the rear end portion of the shaft, showing the bearing, pinion, rack-bar, and adjunctive parts. Fig. 7 is an end view of the shaft, showing one position of the pinion. Fig. 8 is a view similar to Fig. 7, showing the pinion reversed.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The frame of the brush comprises an arm 1 and a fixed handle 2, said arm being provided with bearings 3 and 4 at its ends and the handle 2 being provided with a spring-standard 5, having a bearing 6 at its free end for reception of the rear end of the shaft 7, which is journaled in the bearings 3 and 4 and is provided at its forward end with the brush 8 of any construction and size, depending upon the particular use for which the article is designed. The operating-handle 9 is pivoted at its front end to the bearing 4 and carries the rack-bar 10 and is held a given distance from the fixed handle 2 by means of a spring 11, preferably of V form and having its ends pinned or otherwise secured to the handles 2 and 9.

The spring-standard 5 normally exerts a forward pressure upon the shaft 7, so as to prevent endwise play thereof, and can be pressed aside to admit of removal of the shaft from the frame and detachment of the pinion 12 from said shaft when it is required to reverse the pinion or for any desired purpose. The rack-bar 10 is transversely shiftable with reference to the pivoted handle 9, so as to ad-

mit of its coöperation with the teeth of the pinion 12 upon either side, as indicated most clearly in Figs. 3 and 4, according as it may be desired to rotate the shaft and brush either to the right or to the left. The rack-bar 10 is positively connected with the pivoted handle 9, so as to move therewith, and at the same time it is free to have a limited transverse movement. As shown, the handle 9 is thickened and provided with a seat 13 of wedge form in cross-section, and the attaching end of the rack-bar is provided with a head 14 of corresponding wedge shape, so as to interlock with the seat 13 and prevent detachment of the rack-bar from the handle and insure its movement therewith. The rack-bar is composed of side pieces 15 and transverse pins 16, the latter constituting, in effect, the cogs for coöperation with the teeth or cogs of the pinion 12. This construction of the rack-bar admits of its use and effective operation upon either side of the pinion. The sides 15 of the rack-bar are spaced apart a distance, so as to embrace the sides of the pinion near its periphery, thereby preventing lateral displacement and insuring firm and positive contact of the pins or cogs 16 with the teeth of the pinion 12. When it is required to shift the rack-bar from one side of the pinion to the other, the handle 9 is pressed outward at its rear end, as indicated by the dotted lines in Fig. 5, a distance to admit of the inner end of the rack-bar clearing the pinion, after which the rack-bar may be moved laterally, so as to coöperate with the desired side of the pinion. (See Figs. 3 and 4.)

The pinion 12 is loosely and reversibly mounted upon the rear portion of the shaft 7 and is provided with a pawl 17 to engage with a toothed portion 18 of the shaft, said pawl being set in a recess formed in the side of the pinion, so as not to interfere with the bail 19, provided to hold the rack-bar in engagement with the teeth of the pinion. A shoulder 20 is provided upon the shaft 7 a short distance from its rear end and constitutes a stop for the pinion 12 and for the bail 19, said shoulder being confined between a member of the bail and the pinion, the opposite member of the bail embracing the pinion so as to hold it upon the shaft in conjunction with the spring-standard 5. The bail 19 is constructed of spring metal, and its side members have eyes at their free ends to receive the shaft, and when it is required to remove the pinion the rearmost member of the bail is sprung so as to clear the shaft and admit of removal of the pinion, and after the latter has been replaced the rear member of the bail is readjusted and springs back into place. The closed end of the bail confines the rack-bar against the pinion 12, and in order to reduce the friction to a minimum amount it is provided with a roller 21.

The parts being assembled, as shown in Figs. 1 and 5, and the handles 2 and 9 grasped in the hand and pressed together, rotary motion is imparted to the shaft 7 and brush 8 by coöperation of the rack-bar 10, pinion 12, and ratchet mechanism between said pinion and shaft. Upon relaxing the grip the handle 9 moves outward under the tension of the spring 11 and the pinion 12 turns loosely upon the shaft without imparting movement thereto, because of the riding of the pawl 17 upon the teeth 18. Upon pressing the handles together the operation is repeated. By shifting the position of the rack-bar with reference to the pinion the brush is rotated in the reverse direction, or the same result may be accomplished by reversing the position of the pinion without shifting the rack-bar. Either operation can be quickly effected, thereby admitting of rotating the brush so as to cause the tufts or brush material to travel from the gums toward the edge of the teeth, which is of vital consequence and importance in the preservation of the gums and teeth, so as to prevent receding of the gums frequently caused by improper use of the tooth-brush in brushing toward the gums instead of away therefrom.

Having thus described the invention, what is claimed as new is—

1. In combination, a rotary brush, an operating-handle, a pinion coöperating with the brush, a rack-bar movable with the operating-handle and coöperating with and shiftable from one side to the other of the pinion to effect rotation of the brush in the required direction, and a bail loosely mounted upon the shaft of the brush and embracing the rack-bar in either of its two positions to hold it in contact with the pinion, substantially as set forth.

2. In combination, a brush, a pinion mounted upon the shaft of the brush, an operating-handle, and a rack-bar connected with the operating-handle and adapted to be shifted from one side to the other of the pinion to effect rotation of the brush in one direction or the other, substantially as set forth.

3. In combination, a rotary brush, a pinion mounted upon the shaft of the brush, an operating-handle, a rack-bar slidably connected with the handle so as to shift it from one side to the other of the pinion, and means loosely mounted upon the shaft and adapted to confine the rack-bar in either of its two positions, substantially as set forth.

4. In combination, a rotary brush, a pinion reversibly mounted upon the shaft of the brush, a ratchet mechanism between the pinion and shaft, an operating-handle, and a rack-bar movable with the handle and adapted to coöperate with the pinion for rotating the brush in the required direction, substantially as set forth.

5 5. In combination, a frame, a shaft journaled to the frame and provided with a rotary brush, a spring-standard projected from the handle of the frame and constituting a bearing for the shaft and exerting a pressure thereon in a longitudinal direction to prevent end-wise play thereof, an operating-handle, and actuating means for imparting rotation to said

shaft from the operating-handle, substantially as specified. 10

In testimony whereof I affix my signature in presence of two witnesses.

HOMER POLING. [L. S.]

Witnesses:

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A. M. BEALL.