Sept. 30, 1941. C. A. IMHOFF 2,257,339

ROTARY BRUSH

Filed July 5, 1938

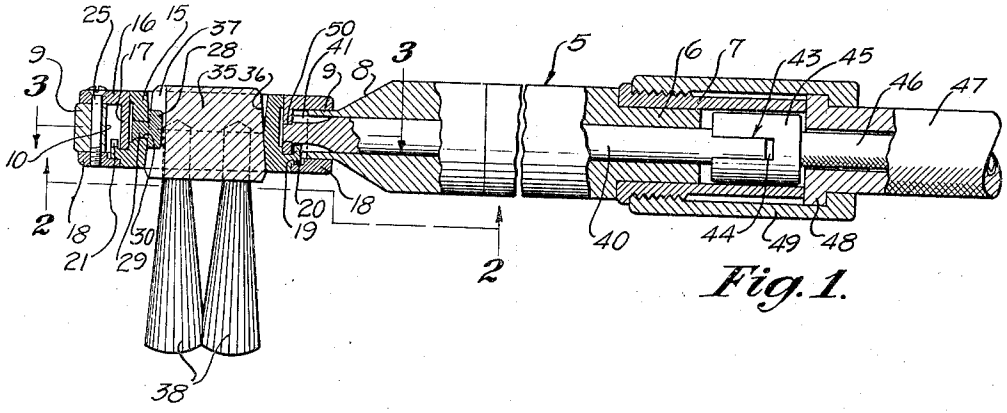


Fig. 1.

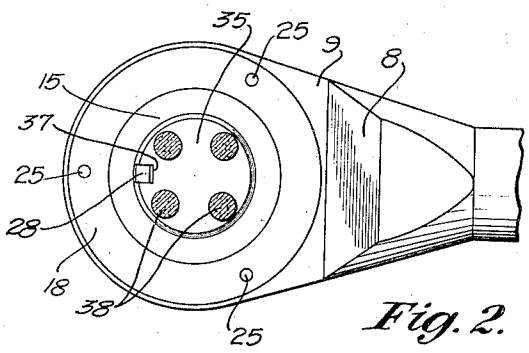


Fig. 2.

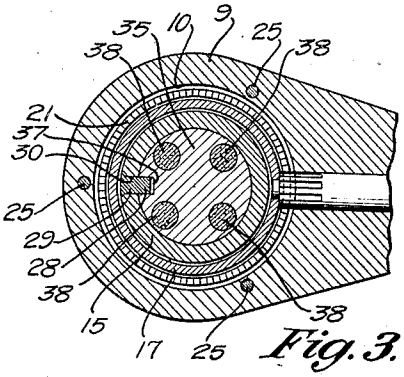


Fig. 3.

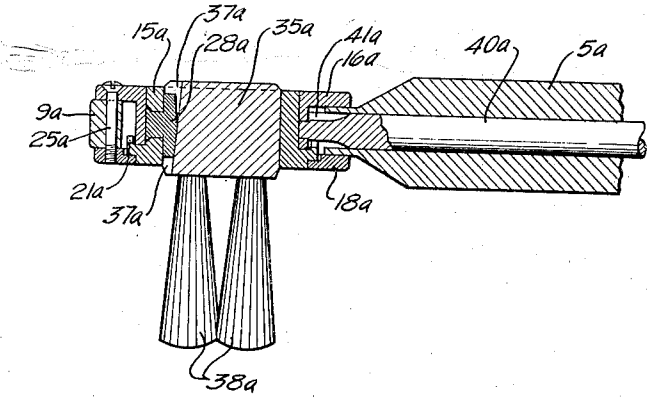


Fig. 4.

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ROTARY BRUSH

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5 Claims. (Cl. 15—28)

My invention has to do with improvements in rotary brushes and, more particularly, to rotary brushes adaptable for dental use.

Among the chief objects, I aim to provide a compact and sanitary device which is economical of manufacture and efficient in use.

Another object is to provide a device of a design and structure providing minimum over-all thickness.

Another object is to provide a structure in which the brush element may be quickly and easily mounted and removed and yet held firmly in position when mounted.

Still another object is to provide a simple and effective means for rotating the brush element and for changing the direction of rotation of the brush. Still further objects will appear hereinafter.

I have found that the chief obstacles to using rotary brushes for dental purposes reside in the fact that, due to their design and structure, they are unsanitary, complicated and may not be made sufficiently small and compact to be effectively used as tooth brushes. By my invention, which comprises the novel elements, combinations and features of structure hereinafter explained and claimed, I effectively overcome those shortcomings.

To make my invention clearly understood, I shall now proceed to describe in detail one preferred embodiment thereof, for which purpose I shall refer to the accompanying drawing, in which:

Fig. 1 is an enlarged side view, partly in longitudinal section and partly in elevation;

Fig. 2 is a bottom plan view on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1; and

Fig. 4 illustrates an enlarged variational form in longitudinal section.

Referring to Figs. 1 to 3, inclusive, I show a round, tubular handle 5 having one of its ends 6 reduced in diameter to receive exteriorly threaded sleeve 7. The opposite end of the handle tapers at 8 to the flattened ring-like body or brush assembly housing portion 9, said portion 9 having a circular opening 10 to receive the brush rotating assembly to be described. Handle 5 is preferably, though not necessarily, integral with body 9 and both are preferably made of "Bakelite" or any other suitable material.

Within opening 10 I mount a brush mounting ring 15 journalled at its exterior side wall in the annular downwardly depending flange 17 of top cover ring 16 and at its bottom annular portion 20 against bearing surface 19 of bottom cover ring 18. The annular portion 20 of ring member 15 underhangs flange 17. A row of gear teeth 21 is provided around the top surface of annular portion 20 of ring 15. Cover rings 16 and 18, respectively, are secured to opposite sides of body 9 by means of screws 25, here shown as three in number. A key 28 is provided on the inner wall of mounting ring 15, the key being secured to the ring by having a shank 29 mounted in hole 30 in ring 15. The inner side wall of ring 15 is bevelled so as to taper longitudinally outwardly from its center and thus provides a wedge fit for the brush base 35 whose side wall 36 is wedge-shaped and longitudinally slotted at 37 to receive the key 28. Thus the brush base is positively held against rotation with respect to the ring by both the key and the wedge fit and is held against escaping outwardly by a wedge fit, regardless of from which end of ring 15 the brush base may be inserted. Suitable brush bristles 38 are embedded at one end in brush base 35 in the conventional manner.

Mounting ring 15 is rotated by shaft 40 journalled in handle 5, the shaft being provided with a circumferential row of gear teeth 41 and having its inner end journalled in hole 50 in flange 17 of ring 16. Said teeth mesh with teeth 21 of the mounting ring 15. The outer end of shaft 40 is provided with a key 43 fitting into key socket 44 of socket member 45, which latter member is connected to a driving member, such as the flexible drive shaft 46 leading from a motor or other suitable driving member, not shown. Shaft 46 is housed within flexible casing 47, the latter being provided with an end portion 48 of increased diameter which is held against the end of sleeve 6 by the interiorly threaded sleeve 49 screwed onto sleeve 7.

The device of Fig. 4 is identical with that of Figs. 1 to 3 except in the following respects: the inner wall of brush mounting sleeve 15*a* is straight while the inner face of key 28*a* tapers from its center to its top and bottom so as to present a V-shape, and longitudinal slot 37*a* in the side wall of the brush base 35*a* tapers from its bottom to its top to provide a wedge fit of the brush base in the ring regardless of from whichever side of the ring the brush base may be inserted. Except for its slotted portion, the side wall of the brush base 35*a* is straight.

In either form of device above described, the direction of rotation of the brush may be reversed by removing the brush base from the

mounting ring and inserting it from the opposite side thereof.

From the foregoing description, it will be observed that the over-all thickness of the body and its carried elements is relatively small and the elements within the body are effectively shielded from exposure by cover rings 16 and 18 and mounting ring 15. The few elements comprising the brush head mechanism may be easily dismantled by removing the three screws 25 so that all parts may be readily cleaned and sterilized.

While I have illustrated and described the preferred form of construction, I of course do not limit myself to the precise details of structure shown and described, but desire to avail myself of such variations and modifications as may come within the scope of the appended claims.

I claim:

1. In a rotary brush device, a body, a brush holding ring rotatably mounted within the body, the inner side wall of said ring being longitudinally bevelled to taper outwardly from its center toward each of its ends, a brush element having a base fitting into said ring, said base tapering longitudinally to engage a portion of the inner side wall of the said ring when inserted therein from either side of the ring, and means for rotating the ring.

2. A rotary brush comprising, in combination: a body having a handle portion and a flattened head portion, a sleeve rotatably mounted transversely of and extending entirely through the head portion, the bore of the sleeve opening at both sides of the head, means in the head for rotating the sleeve, and a brush having a longitudinally tapered base fitting and being insertible into said sleeve from either end of the sleeve, said sleeve having a brush-base receiving inner wall which tapers from each of its ends inwardly towards its axis whereby to frictionally engage the tapered base when said base is inserted from either end of said sleeve.

3. In a rotary brush device, a body, a brush holding ring rotatably mounted in the body, a key secured to the inner wall of the ring, said key extending longitudinally of the ring and tapering from each of its ends inwardly towards the axis of the ring, and a brush element having a base fitting into the ring, said brush presenting a longitudinally extending slot one of whose walls tapers longitudinally so as to be frictionally engaged by a portion of the tapered surface of the key.

4. In a device of the class described, a body having a ring-like portion, a cover ring secured to the body, said cover ring presenting a downwardly depending inner bearing flange, a rotatable brush holding ring journalled in said flange, said brush holding ring having a bottom annular outwardly depending flange underhanging said bearing flange and provided with a circumferential row of gear teeth, a tubular handle on the body, a drive shaft in the handle, said shaft being journalled at one end in said bearing flange and having a toothed portion operatively engaging the gear teeth on the brush holding ring, and a brush element having a base housed in and frictionally engaging the brush holding ring.

5. A rotary brush comprising a flattened head, an opening transversely therethrough, a sleeve of a length coextensive with the length of the opening, said sleeve being journalled in the opening to rotate about an axis transversely of the head and having a longitudinal bore open at both its ends, a brush base having a bristle embedding portion carried within the bore and bristles extending outwardly from an end of the base, the opposite end of the base terminating at the opposite end of the bore, and means in the head for rotating the sleeve.

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