

Dec. 8, 1931.

L. H. ALLES

1,835,837

TOOTHBRUSH

Filed July 15, 1930

2 Sheets-Sheet 1

Fig. 1

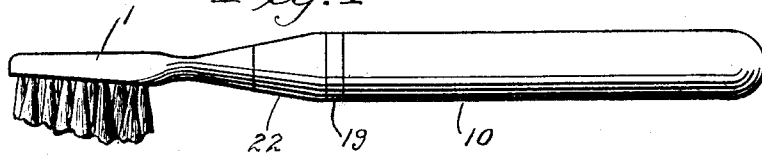


Fig. 2

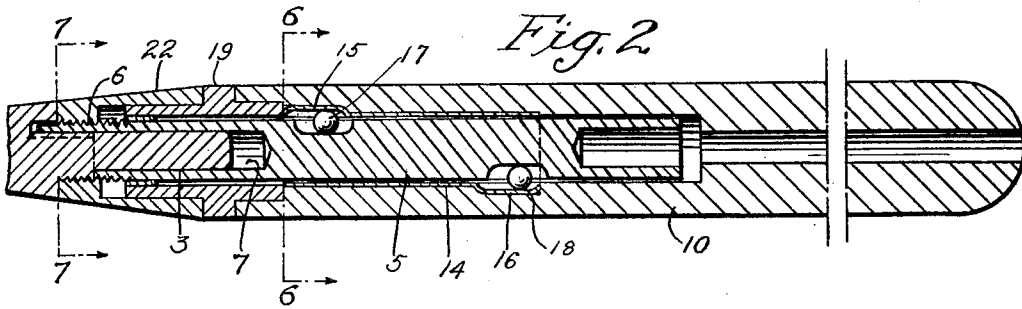


Fig. 3

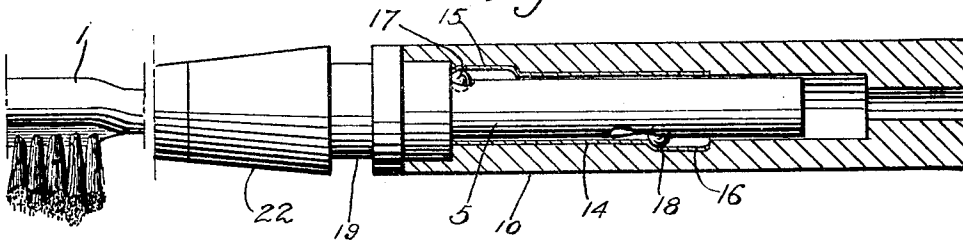


Fig. 4.

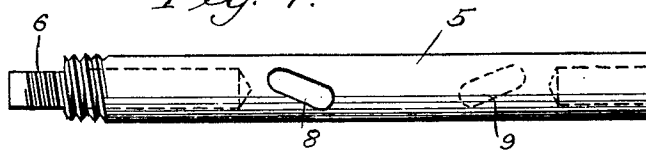


Fig. 5.

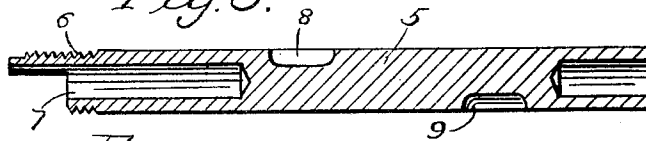


Fig. 6.

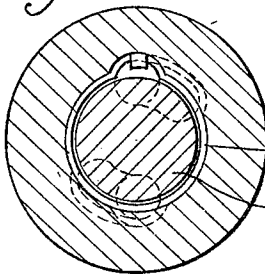
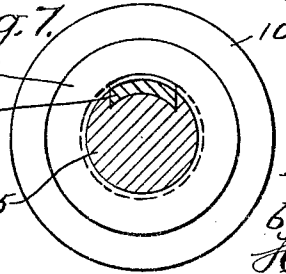


Fig. 7.



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Fig. 8.

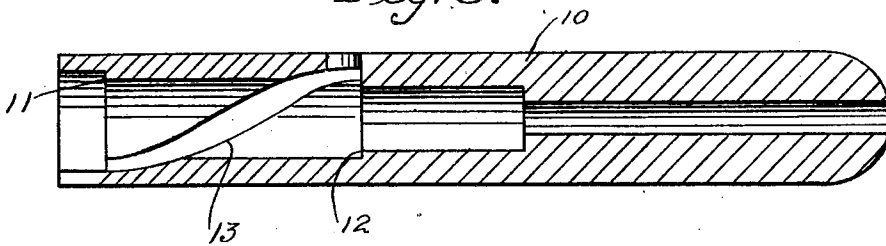


Fig. 9.

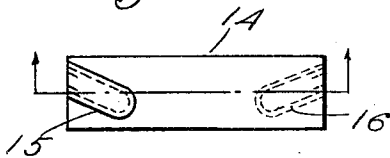


Fig. 10.

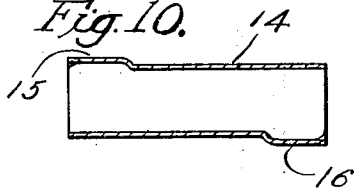


Fig. 13.

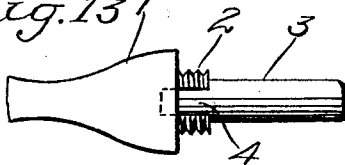


Fig. 14.

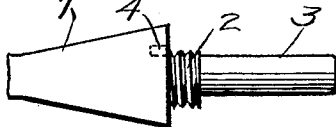


Fig. 11.

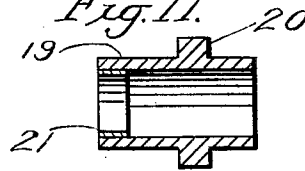


Fig. 12.

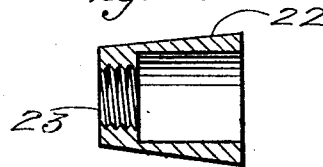
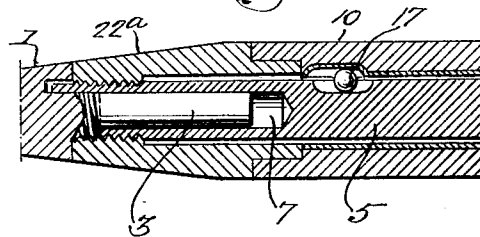


Fig. 15.



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UNITED STATES PATENT OFFICE

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TOOTHBRUSH

Application filed July 15, 1930. Serial No. 468,096.

This invention relates to improvements in oscillatory tooth brushes, and one object of my invention is to provide a tooth brush in which a comparatively small longitudinal movement of the handle of the tooth brush effects a comparatively large oscillatory movement of the brush element, a further object of the invention being to provide a tooth brush of the nature specified, in which the movement is effected with a minimum of friction between the relatively moving elements.

The invention further contemplates the provision of an oscillatory tooth brush of comparatively cheap and simple construction, easily assembled and disassembled, and extremely efficient in operation.

The present invention is in the nature of an improvement over the device disclosed and claimed in my prior Patent No. 1,415,760, granted May 9, 1922. This invention provides a more rigid construction than my prior device, and also embodies a new and novel means for removably attaching the brush-carrying member to the handle structure.

The invention will be more readily understood by reference to the attached drawings, in which:

Fig. 1 shows my improved tooth brush in assembled relation;

Fig. 2 is a sectional view through the device of Fig. 1, the brush-carrying portion being only partly shown due to the lack of space;

Fig. 3 is a view similar to Fig. 2 except that the parts are in different relative positions;

Fig. 4 shows the oscillatory brush-supporting shaft of my device;

Fig. 5 is a sectional view of the shaft of Fig. 4;

Fig. 6 is a sectional view along lines VI—VI of Fig. 2;

Fig. 7 is a sectional view along line VII—VII of Fig. 2;

Fig. 8 is a sectional view of the handle member of my device;

Figs. 9 and 10 show a sleeve which is inserted in the handle member;

Fig. 11 shows a bushing which is used in my device;

Fig. 12 shows the member for removably attaching the brush-carrying member to the oscillatory shaft;

Figs. 13 and 14 show in detail a portion of the brush-carrying member; and

Fig. 15 shows a modification of the structure shown more clearly in Fig. 2 in which the members 19 and 22 have been combined in a single element.

Referring to the several views of the drawing, I provide a brush-carrying member 1 having a threaded extension 2 with an extending integral shank 3, shown more clearly in Figs. 13 and 14. The threads 2 extend only partly around the shank 3, leaving an open portion 4. A shaft 5 is provided with an extending threaded portion 6 and a receptacle 7. The outer end of extension 6 is threaded in a complementary manner with respect to extension 2 and is adapted to extend into the space 4 of the brush-carrying member 1. The shaft is shown clearly in Figs. 4 and 5. The shank 3 of member 1 is adapted to extend into the receptacle 7 of shaft 5. The shaft is also provided with two spirally arranged slots 8 and 9. A handle member 10, shown more clearly in Fig. 8, is formed to have shoulders 11 and 12 for a purpose which will be clearer hereinafter. Member 10 is also provided with a spirally arranged groove 13 in the inner surface thereof. A sleeve 14, shown more clearly in Figs. 9 and 10, is adapted to fit into the member 10 and abut against shoulder 12. Spirally arranged recesses 15 and 16 in sleeve 14 coincide with groove 13 of member 10. As shown in Figs. 2 and 3, when the sleeve 14 is inserted in the handle member 10, and shaft 5 is extended through the sleeve into the handle member, slots 8 and 9 of shaft 5 and recesses 15 and 16 of sleeve 14 form respectively a pair of spirally arranged chambers. A pair of spherical elements 17 and 18 are disposed within these chambers, so that upon reciprocation of the handle member, a rotary movement is imparted to the shaft. In Fig. 2, the device is shown with the handle member at one end of its reciprocating stroke, and in Fig. 3, it is shown at the other end of its stroke.

A bushing 19, shown in Fig. 11, is provided with an annular extension 20 which abuts against the end of the handle member, as shown in Figs. 2 and 3. This bushing is fastened to the handle member in any suitable fashion, such as by means of a forced fitting or cement. A washer 21 is inserted in the end of bushing 19 to take up the wear due to the longitudinal movement of shaft 5. A member 22 is adapted to fit over one end of bushing 19, as shown in Figs. 2 and 3 and is provided with a threaded opening 23 which engages the complementary threaded portions 6 and 2 of the shaft and brush-carrying member respectively.

In assembling my device, it is merely necessary to insert sleeve 14 within the handle member, position the shaft 5 and spherical elements 17 and 18 within the handle member in cooperative relation with the spiral recesses, insert bushing 19 and its associated washer within the handle member and around the shaft, screw member 22 on the outer end of shaft 5, and place the brush-carrying member 1 in cooperative relation with shaft 5, turning member 22 to fasten the parts rigidly. The device is now fully assembled and upon longitudinal movement of the handle member, while the brush is frictionally engaging the teeth of the user, a rotary or up and down movement will be imparted to the brush by virtue of the spirally arranged cooperating grooves in the handle member and supporting shaft. Fig. 2 shows the device with the handle member moved toward the brush at the end of its stroke, while Fig. 3 shows the handle member moved away from the brush at the other end of its stroke.

In the device of my prior patent mentioned above, I provide a single groove and spherical element to obtain the same relative motion of parts as in the present device. With this construction, however, a rigid assembly of parts was difficult of attainment. The present invention overcomes this objection by providing a pair of spiral grooves and a pair of spherical elements cooperating therewith. This invention also provides a very useful brush-removing and fastening assembly. Obviously, several brush-carrying elements, each provided with a different type brush, may be used with the same handle structure. To remove the brush, it is only necessary to turn member 22 which threadedly engages both the brush-carrying member and the supporting shaft 5. Not only does this construction provide a useful brush-removing assembly, but it also provides a very rigid mounting of the brush-carrying member on the handle structure.

In Fig. 15, there is shown a modification of the structure shown more clearly in Fig. 2 and heretofore described, in which the bushing 19 and member 22 have been combined to form a single element. In this case, the

structure is the same as that of Fig. 2 except that using a single element in place of two makes the construction more simple. As stated before, a brush-carrying member 1 having a threaded extension with an extending integral shank 3 is provided. The threads extend only partly around the shank 3. The shaft 5 has a recess 7 for receiving shank 3 and is provided with an extending threaded portion 6, the outermost threads of portion being complementary to the threads of member 1. A shell-like member 22a is threaded so as to removably attach member 1 to shaft 5. It will be noted that in this embodiment, member 22a moves with member 1 and shaft 5 as the latter is actuated by the reciprocating movement applied to handle member 1. This construction lessens the number of parts making up the device and, therefore, provides a more simple structure which is easier to manufacture and less apt to get out of adjustment.

Obviously, many changes and modifications of my device are possible. The specific structure and various details disclosed herein are for the purpose of illustration only. It is to be understood, therefore, that my invention is not to be limited thereby but only by the scope of the appended claims.

I claim:

1. In a tooth brush, a brush-carrying member and a supporting member therefor, said members having complementary surfaces, a handle element, said supporting member and handle element having sets of registering spiral grooves, and a plurality of elements within said grooves and adapted to move relative to both supporting member and handle element when the brush is actuated, and means associated with said complementary surfaces to removably attach said brush-carrying member to said supporting member.

2. In a tooth brush, a brush-carrying member and a supporting member therefore, said members having complementary threaded portions, a handle element, said supporting member and handle element having sets of registering spiral grooves, and a plurality of elements within said grooves and adapted to move relative to both supporting member and handle element when the brush is actuated, and means threadedly associated with said complementary portions to removably attach said brush-carrying member to said supporting member.

3. In a tooth brush, a brush-carrying member having a threaded extension with a slot therein, a supporting member for said first member having a threaded extension adapted to seat in said slot, means threadedly engaging said threaded extensions to removably attach said brush-carrying member to said supporting member, a handle element, said supporting member and handle element having sets of registering spiral grooves, and

a plurality of elements within said grooves and adapted to move relative to both supporting member and handle element when the brush is actuated.

5 4. In a tooth brush, a brush-carrying member and a supporting member therefor, said members having complementary threaded extensions, and a locking member threadedly
10 attach said brush-carrying member to said supporting member, one of said members having a shoulder surface against which an end of said locking member abuts, whereby the joint structure is made rigid and self-loosening
15 thereof is substantially prevented.

5. In a tooth brush, a brush-carrying member and a supporting member therefor, said members having complementary surfaces,
20 and a locking member associated with said surfaces to removably attach said brush-carrying member to said supporting member, one of said members having a shoulder surface against which an end of said locking
25 member abuts, whereby the joint structure is made rigid and self-loosening thereof is substantially prevented.

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