

J. H. ABBOTT.
 GUARD SLEEVE FOR DENTAL SPINDLES.
 APPLICATION FILED AUG. 29, 1911.

1,030,856.

Patented July 2, 1912.

FIG. 1.

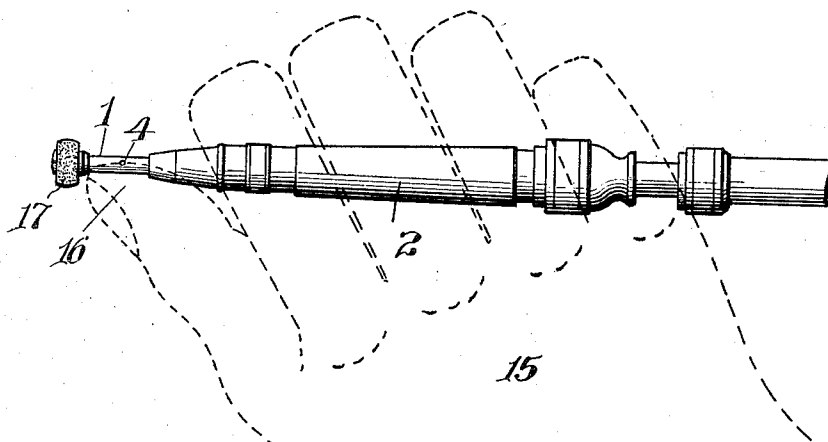


FIG. 2.

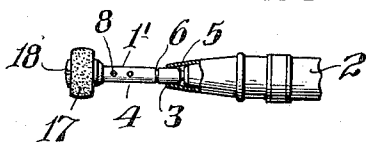


FIG. 5.

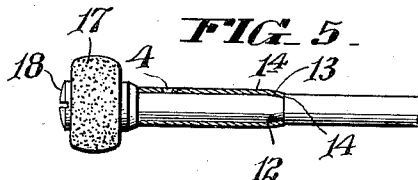


FIG. 3.

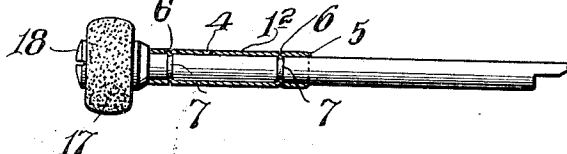
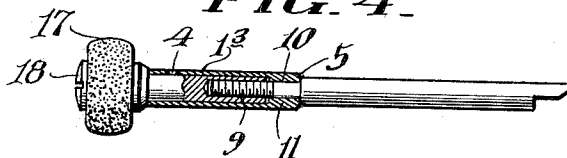


FIG. 4.



WITNESSES

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GUARD-SLEEVE FOR DENTAL SPINDLES.

1,030,856.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed August 29, 1911. Serial No. 646,744.

To all whom it may concern:

Be it known that I, JAMES HERMAN ABBOTT, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented a certain new and useful Guard-Sleeve for Dental Spindles, of which the following is a specification.

The purpose of my invention is to protect the patient from contact with a rotating spindle or part and to effectively close the end of a dental hand piece against water, etc., by means separate from the hand piece and preferably carried by the mandrel itself.

A further purpose of my invention is to mount a cover or sleeve rotatably upon any rotatable spindle or tool capable of being operated by the dental chuck within a hand piece and, preferably, to engage the sleeve frictionally with the interior of the nose of the hand piece.

A further purpose of my invention is to provide an outside bearing upon a rotatable spindle for use as a steadying hand rest in accurate manipulation of the tool carried by the spindle.

Other purposes will appear in the specification and claims forming a part hereof.

I have preferred to illustrate my invention by several forms only thereof, selecting some which I have found to be simple, inexpensive, practical and efficient, but without attempting a showing of all, nor even of any considerable number of the possible forms in which it might appear.

Figure 1 is a side elevation of one form of my invention in position for use. Fig. 2 is a detail view of a structure similar to Fig. 1, the casing of the hand piece being partially broken away. Figs. 3, 4 and 5 are elevations, partly in section, showing varied means for retaining a sleeve rotatably upon a spindle.

While my invention is applicable to the spindle or shaft of any drill, bit or tool capable of being rotated by or within a dental hand piece, I have selected a spindle carrying a removable grinding stone as typical and have illustrated it accordingly. In the dental hand piece used within the mouth the friction of the rotating spindle against the mouth is quite objectionable and, where rubber dams are being used, the spindle often catches upon the dam and rolls it up. The attempt to extend the hand piece has been objectionable for many reasons. It

has been unsightly. The bulk is considerably increased. Circumstances arise where the cover is neither required nor desired, but when it must be used if part of the hand piece. The hand piece is a standard article, in use all over the world, and any changes in it involve widespread loss of the investment already involved or equally widespread local tinkering in the endeavor to alter the existing hand pieces. There can be no continued extension of the point of bearing farther out along the spindle since this would bring wear upon the hand piece, which would soon cease to perform this function. The proposed covers have come close to the spindle at the outer ends only and, for this reason, do not effectively prevent water from flowing into the interior of the hand piece when applied to the tool in use. The distance from the chuck of the hand piece is fixed and requires a standard of mandrel or spindle length which need not otherwise be maintained. I have overcome all of these objections by the provision of a guard, cover or sleeve 1 which is separate from the hand piece 2 but preferably capable of frictional engagement with the interior of the nose of the hand piece at 3, Fig. 2. The absence of this frictional engagement with the hand piece would merely result in the sleeve 1 running all the time except when it met with outside frictional resistance, such as the mouth of the patient or the hand of the operator, to stop it. Contact with it would not be nearly as objectionable as that with the unguarded spindle as it would not offer the same frictional force nor continue to rotate, but it would not attain the full benefit of my invention.

My sleeve may be separable from both the hand piece and spindle, as in Fig. 1, for use when desired with any spindle, or it may, preferably, be secured against removal from the spindle as at 1', 1², 1³, 1⁴. The separate sleeve has the advantage of capability of use with existing equipment without any change and can normally be retained frictionally within the nose of the hand piece while the various tools are being changed and used, different lengths of sleeve being provided as desired: The form of Figs. 2-5, however, avoids all question of length, is always at hand when the spindle is inserted, is not subject to excessive wear, holds lubrication better and more completely bars entrance of moisture, grit, etc., from grind-

ing, particularly porcelain. In each of the forms I provide for lubrication at 4 and prefer to taper or chamfer the rear end at 5 so that the sleeve may be more easily introduced within the nose of the hand piece.

I have shown several convenient means for retaining the sleeves, in Figs. 2-5, against excessive longitudinal movement upon the spindles, and in each case it will be evident that the sleeve may have some such means at any desired number of points throughout its length. In Fig. 2 I show a sleeve intended to have two such engagements with the spindle. For this purpose the sleeve is grooved circularly at 6, for engagement of the internal circular rib thus formed with a corresponding groove 7, seen in Fig. 3, and is indented at one or more points, as at 8, for engagement of the resulting internally projecting part or parts with a corresponding groove. Whatever the form of indentation of the sleeve, it may be given readily by exterior pressure after the sleeve has been mounted upon the spindle. Where two interlocking engagements with the spindle are provided for, I prefer to place the oil hole between them. The film of oil which would normally fill the space between the sleeve and spindle and affords effective check to leakage of water through the space into the hand piece, is thus placed to the best advantage, and its retention is assisted by the centrifugal force of the rotating spindle and oil within the section limited at each end by the grooves or other means of retaining the sleeve. In Fig. 3 I have shown two annular grooves in the spindle cooperating with corresponding annular depressions in the sleeve. In Fig. 4 I have divided the spindle, threading the one part into the other at 9, and forming a space about the reduced part 10 of one for the free rotation of the part 11 of the sleeve. This form, while more expensive, offers the advantage of firm retention in use with easy removability for replacement or application to other spindles when desired. In the form shown in Fig. 5, I have illustrated a circular groove 12 in the spindle for the preferably annular contraction of one end, 13, of the sleeve, the wall 14 of the groove being preferably an abrupt one.

While, obviously, the matter of material is

not involved in the mechanical structure of the invention, I prefer to use brass for the sleeve in order that it may cooperate to the best advantage with the iron or steel normally used for the spindle.

Where a grinding tool is to be used upon delicate work, inside or outside of the mouth of the patient, as well as in a variety of other work, it is desirable to steady the tool as close to its operating face or edge as possible. My invention provides for this in the use indicated in Fig. 1, where the hand of the operator is shown at 15, with the thumb 16 steadying against the stationary sleeve 1, in order that the stone 17 may be used to the best advantage. Screw 18 provides for insertion of other tools, with which, as with other drills, bits and tools, the various uses of my invention are the same, the stone being taken for convenience to represent the many tools which might be used.

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

1. In a device of the character stated, a dental tool having a spindle, a sleeve surrounding the spindle back of the operative part of the tool and cooperating means upon the spindle and sleeve permitting rotation therebetween, but preventing longitudinal withdrawal of the sleeve from the spindle.

2. In a device of the character stated, a dental tool having a spindle annularly recessed at two points and a sleeve apertured to admit oil and inwardly extending to enter the recesses.

3. In a device of the character stated, a dental hand piece, a sleeve frictionally engaging the interior of the casing of the hand piece and projecting therefrom and a dental spindle passing through the sleeve and free to rotate with respect to it.

4. In a device of the character stated, the combination of a dental handpiece, a dental tool having a spindle fitting therein, and a protective covering for the part of the spindle close to the tool, rotatable with respect to the tool.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."