DENTAL ROOT PREPARATION INSTRUMENT

Phillips Brooks
This Invention relates to dental tools and crown teeth.

An object of this invention is to provide an improved means in the form of a reamer for reaming out the canal of the root of a tooth in order to receive the shank or root of a crown tooth.

Another object of this invention is to provide an improved reamer for reaming out the canal of a tooth root and at the same time forming a base or foundation to receive the base of the crown tooth support, the reamer effecting in a single operation the completion of the work required to receive the crown tooth which has heretofore required three or more operations.

A further object of this invention is to provide an improved reamer of tapered construction which will form the required socket for the root of the crown tooth without undue weakening of the tooth.

A further object of this invention is to provide an improved crown support which is formed with a root and a cap, and which has extending upwardly from the cap a crown stump about which the crown tooth is secured.

A further object of this invention is to provide an improved root face and canal enlarger which will form at the top of the root a countersunk circular foundation continuous with the enlarged root canal, and which form an annular trough below and continuous with the outer circumference of the countersunk foundation to receive a metal cap and shank support without weakening the root.

To the foregoing objects, and others which may hereafter more fully appear, the invention consists of the novel construction, combination and arrangement of parts, as will be more specifically referred to and illustrated in the accompanying drawings, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings,

Figure 1 is a detailed side elevation of a reamer constructed according to an embodiment of this invention,

Figure 2 is an enlarged longitudinal section, partly in detail, of the device,

Figure 3 is a sectional view taken on the line 3–3 of Figure 2,

Figure 4 is a vertical sectional view showing the opening or socket formed by the reamer,

Figure 5 is a vertical sectional view of a crown tooth and support therefor mounted on the root of the tooth,

Figure 6 is a bottom plan view of the crown stump base and support,

Figure 7 is a detailed side elevation of a modified form of reamer,

Figure 8 is a detailed side elevation of another modification of this reamer,

Figure 9 is a detailed side elevation of a further modification of this reamer,

Figure 10 is a detailed side elevation of a further modification of this invention.

Referring to the drawings and first to Figures 1 and 2, the numeral 10 designates generally a conical reamer shank which has secured to or formed integral with the upper large end thereof a cap 11. The cap 11 includes a downwardly extending annular flange 12 forming an annular chamber 13 between the flange 12 and the base or upper end of the reamer shank 10. The cap 11 has extending laterally therefrom at the upper end thereof an annular flange 14 which forms a stop for limiting the insertion of the shank 10 within the canal of the tooth root. A stem 15 extends upwardly from the cap 11, being formed at its upper end with a coupling means 16 of conventional construction, whereby the stem 15 may be detachably coupled to an engine hand piece. The outer surface of the reamer shank 10 is coated with an abrasive 17 and the under side of the cap 11 is also coated with an abrasive 18. The three sides of the flange 12 are also coated with an abrasive 19 so that when the reamer shank 10 is moved downwardly into the canal of the tooth root, a conical opening of uniform configuration will be formed and the three sides of the flange 12 which have an abrasive mounted thereon will form an annular groove 20 in the reamer 21.

In order to provide for release of the material removed from the tooth by the abrasive, the cap 10 is formed with an opening 22 which extends from the outer side of the cap and communicates with the chamber 13. The reamer is coupled to the engine hand piece in the normal manner and is then moved downwardly within the canal of the tooth root and thereby forms a conical socket 23 of uniform configuration. The flange 12 forms the annular groove or channel 20 and also forms an annular rib 24 at the upper or base end of the socket 23. There is also formed a relatively large opening 25 above the rib 24 for receiving the base of the crown stump. As shown in Figure 5, the peg or root 26 of a crown tooth support is inserted in the conical socket 23 formed by the reamer being cemented thereon and the peg or
root 26 is formed at its upper end with a flanged cap or head 27 which snugly engages in the annular groove 20 and also fills the chamber 25. A crown stump 28 extends upwardly from the cap or head 27 and the crown tooth 29 is adapted to be formed about the stump 28. The lower end of the crown tooth 29 bears against the upper previously formed end 30 of the tooth 21 and is cemented or otherwise firmly secured thereto.

Referring now to Figure 7, there is disclosed a modified form of reamer which includes a shank 31 of spiral configuration, and which has formed integral with the upper end thereof of cap 11a having an annular flange 12a coated with the inner and outer sides, and the lower edge thereof, with a suitable abrasive. The cap 11a has an annular flange 14a extending laterally therefrom which forms a stop or limit means for limiting the extension of the shank shank 31 into the canal of the tooth root. As shown in Figure 7, the upper side of the cap 11a and the flange 14a is flat, whereas in Figure 8 there is disclosed a slightly modified form of this reamer wherein the upper side of the cap 11a and the flange 14a are of convex configuration.

Referring to Figure 9, there is disclosed a further modification of this reamer. In this form of the invention the upper portion of the reamer is identical with the reamer shown in Figures 1 and 2, with the following exceptions: the shank 10c, which is of tapering shape, is substantially shorter in length than the shank 10 and is designed for small rooted teeth wherein the canals are small and it is hazardous to ream the root canal large enough all the way down in making crown supports. The shank 10c is coated with an abrasive 11c for only a portion of the length thereof, from the upper large end, and abrasive covering not more than one-third of the length of the shank, and the remaining uncoated portion 32 of the shank constituting a tapering guide.

Referring to Figure 10, there is disclosed a modification of the structure shown in Figure 7. The structure shown in Figure 10 is identical with that of Figure 7, with the exception that the spiral cutting portion 23 which extends from the upper end of the shank 34 extends downwardly from the upper end for a distance of about one-third of the length of the shank, and the remaining smooth lower portion 35 of the shank serves as a guide for the tool without effecting any cutting or enlargement of the canal.

In the use of this reamer the tooth root 21 is cut off, so as to provide a flat upper surface 30 whereupon the reamer such as the reamer shown in Figures 1 and 2, is inserted in the engine handpiece. The reamer shank 10 is then moved downwardly into the canal of the root 21 being moved downwardly to the limit provided by the stop flange 14. The material cut by the abrasive may be discharged from the canal through the passage 22, or if desired, the reamer may be periodically removed and cleaned in liquid or by any other suitable means. When the cap 11 engages the upper end of the tooth root 21, the cutting flange 12 will form the annular groove 20 and the abrasive 18 on the lower side of the cap 11 will form the rib 24 which is positioned below the upper surface 30 of the tooth root.

The crown tooth 29 in support including the peg or root 26 and the crown stump 28 may then be placed on the root 21, the peg or root 25 being cemented or otherwise firmly secured in the socket 23. The upper surface of the head or cap 27 at the upper end of the peg or root 26 will be flush with the upper surface 30 of the root 21. The crown 29 may then be formed in the usual manner on the stump 28.

With a reamer as hereinbefore described, the tooth root can be prepared for receiving the crown tooth in only one sitting and one operation, whereas with prior known devices it has required at least three sittings or operations in order to properly prepare the tooth root for receiving the crown tooth and fixing the crown tooth in the prepared socket. Furthermore, with a reamer as hereinbefore described, a dentist will not be required to have any special training in the mounting of crown teeth and can readily prepare the tooth root for the crown tooth. This reamer may be used for teeth which are non-vital or teeth wherein the nerve is dead, which teeth are so often extracted because of the difficult procedures previously employed in restoring them.

Stump work for the foundation of jacket crowns and pivots has been employed in dentistry for many years. Prior to this invention it was a hazardous and difficult procedure. The procedure in the old method was first to cut the crown of a deciduous or dead tooth off to or below the gum-line, then to ream the root canal sufficiently large to insert a pin. The gum end or upper surface of the root was then countersunk or ground out and wax was placed on the outside periphery of the root, a depth of several millimeters. The cavity or countersunk space was continuous with the enlarged root canal. The usual method of producing the countersunk space was to employ small freestand fixture burrs. A pin was then inserted into the enlarged root canal and wax was pressed over it filling the cavity. The wax with pin attached was then drawn out of the root, and by casting process metal replaced the wax making a union with the pin. The resulting part was then cemented into the root after the crown had been attached to it in one of several ways.

In my method, as set forth in this application, there is a decided conservation of root structure with maximum strength. Another outstanding feature of my invention is that it provides a double support involving two principles, namely, the countersunk space and an annular trough. This recess, which is continuous with the enlarged root canal of definite size, provides for the insertion of a perfectly fitting metal cap attached to a pin. This ready made part obviates the casting process and the waxing step, thus saving at least seventy-five percent of time. This method has proven to be far less nerve rattling to the patient and dentist. As before stated, the entire operation is performed in one short sitting whereas it has taken three or more sittings with the old method accompanied by uncertain and hazardous results.

Tooth roots are of different sizes and lengths, therefore, it would be impractical to give exact dimensions of the length and radius of my instrument which is employed in this invention, but in no case would it be necessary for the annular flange which creates the annular trough below the countersunk space to be deeper than three to four millimeters.

The exact configuration illustrated is regarded as the optimum, but some of the desirable results inherent in this disclosure may be obtained by various slight modifications including some departure from the exact configuration shown, and it is therefore requested that the scope of the
invention should be regarded as limited only by the terms of the claims.

What I claim is:

1. A reamer for preparing a tooth root for receiving a crown tooth comprising a tapered shank, a cap at the upper end of said shank including a depending annular flange, an abrasive on the lower inner side of said cap and about the inner and outer sides and lower edge of said flange, an outwardly extending annular flange carried by said cap constituting a stop, and a chuck engaging stem extending from the upper end of said cap.

2. A reamer as set forth in claim 1 wherein the outer surface of said shank is coated with an abrasive.

3. A reamer as set forth in claim 1 wherein the outer surface of said shank is formed with a spiral cutter.

4. A reamer as set forth in claim 1 wherein the upper surface of said second flange is coplanar with the upper flat surface of said cap.

5. A reamer as set forth in claim 1 wherein the upper surface of said second flange is convex.

6. A reamer as set forth in claim 1 wherein the tapered shank is coated with an abrasive about its upper third.

7. A reamer as set forth in claim 1 wherein the tapered shank is provided with a spiral metal cutter for a portion of the length thereof extending from the upper end thereof, the remaining lower portion of the shank being smooth and constituting a guide means.

8. A reamer as set forth in claim 1 wherein said abrasive extends downward from the upper end of said shank for a distance of substantially two millimeters from the lower edge of said cap.

9. A reamer as set forth in claim 1 wherein said abrasive engages about only the lower portion of the outer side of said flange.

PHILLIPS BROOKS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,794,128</td>
<td>Walsh</td>
<td>Feb. 24, 1931</td>
</tr>
<tr>
<td>2,250,058</td>
<td>Brooks</td>
<td>July 22, 1941</td>
</tr>
</tbody>
</table>