

[54] COMBINATION ENDODONTIC APICAL SEALER AND CROWN POST

3,747,216 7/1973 Bassi et al. 32/57

[76] Inventor: Mark J. Fishman, 877 E. 54th St., Brooklyn, N.Y. 11234

Primary Examiner—Robert Peshock
Attorney, Agent, or Firm—Joseph E. Rusz; Sherman H. Goldman

[22] Filed: Aug. 28, 1973

[21] Appl. No.: 392,382

[57] ABSTRACT

[52] U.S. Cl. 32/15; 32/57

[51] Int. Cl.² A61K 5/02

[58] Field of Search 32/40 R, 57, 13, 15

A method and apparatus for sealing the apex of endodontically treated teeth and simultaneously providing a post-core crown build up for teeth that need both endodontics and a core for retention of a crown, the apparatus involving an endodontic sealer screw or plug having a shaft configured to bond with a root canal filler and a crown core form.

[56] References Cited

UNITED STATES PATENTS

430,522 /1890 Genese 32/13

9 Claims, 3 Drawing Figures

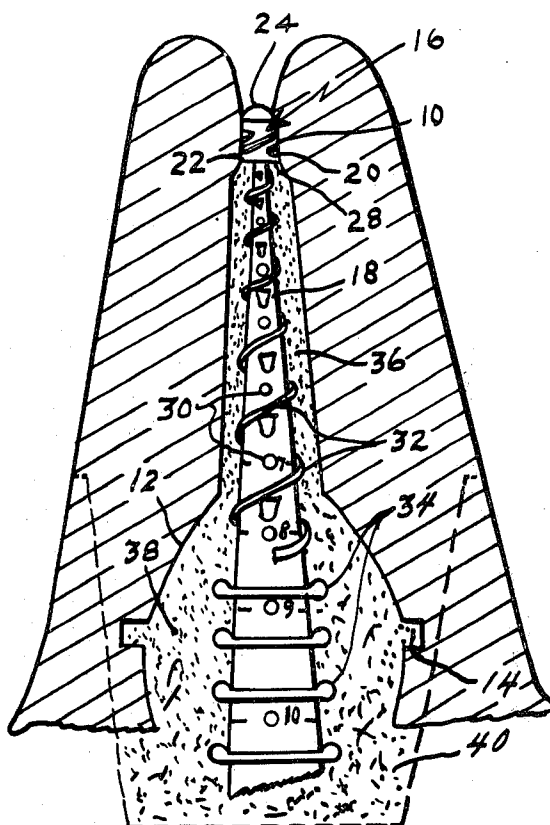


FIG. 1

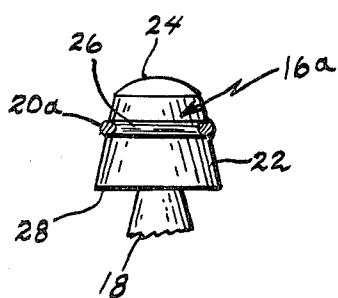
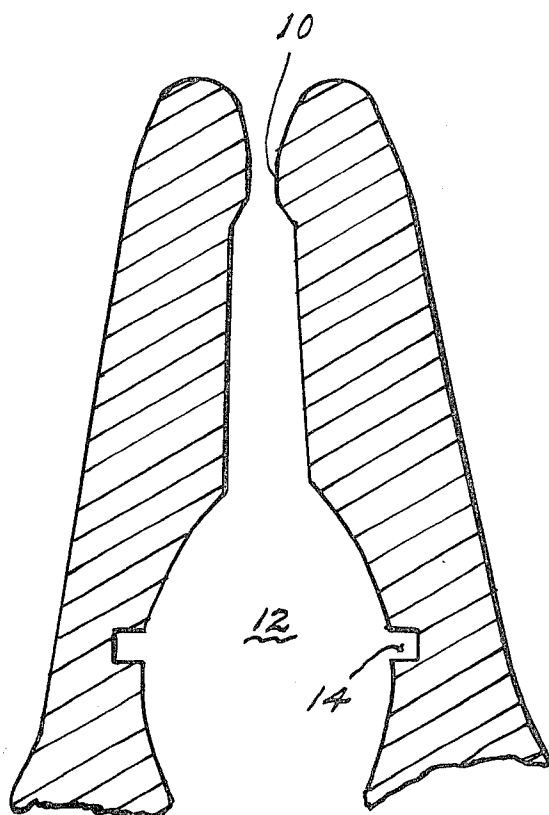


FIG. 3

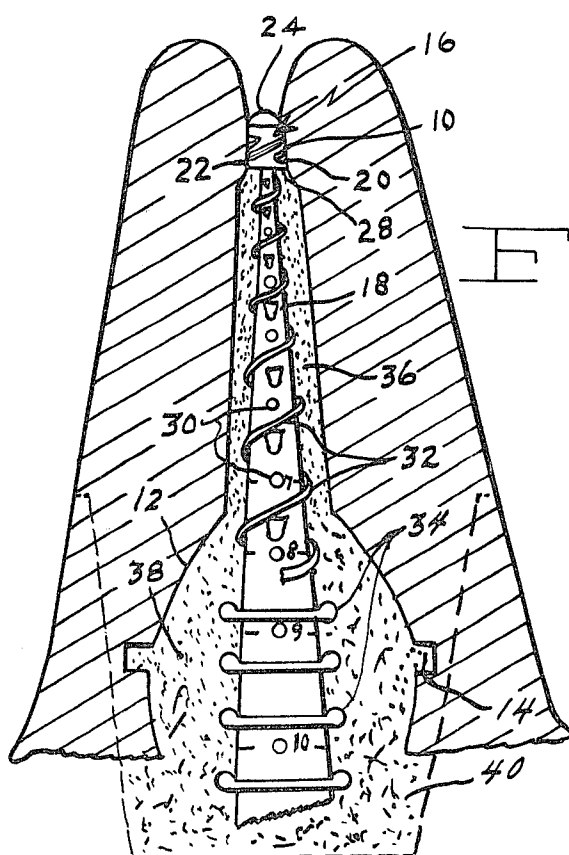


FIG. 2

COMBINATION ENDODONTIC APICAL SEALER AND CROWN POST

STATEMENT OF GOVERNMENT INTEREST

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

BACKGROUND OF THE INVENTION

This invention relates generally to a technique and apparatus for endodontically treating teeth and providing a support for a crown and more particularly to a tapered self-sealing screw or plug having an extension which forms a support for a crown while the plug portion seals the apical end of a root canal.

Previously, endodontic procedures and preparation of a core for a crown to be applied to an endodontically treated tooth involved two or three procedures or visits and required canal impressions followed by castings or gold posts which were not as stable as might be desired. The endodontic procedure and apparatus has been described in my copending application Ser. No. 374,824, filed June 29, 1973 and titled "Endodontic Apical Sealer Method and Apparatus" and allows for the syringing of filler into lateral canals, when present, and the main canal, without overfilling, i.e., the presenting of the sealing material beyond the apex of the canal in contact with periapical tissue.

When a tooth also required a post-core crown build up, a separate procedure was instigated to ream the root canal remote from the apex to receive a post. An impression of the canal and a casting of a post to support a crown were formed as a part of the core build up. This usually required separate visits.

SUMMARY OF THE INVENTION

This invention comprises an endodontic self-sealing apical element or screw having an extension which is utilized in a post-core crown build up to enable a technique capable of performing both functions in a single procedure. The element is placed in position and sealed to the root canal at its apex after filing or reaming. Root canal filler is syringed and the coronal portion is packed. The core form extension then has material brushed or packed around it and the excess extension is removed and the material shaped.

Accordingly, it is an object of this invention to provide a technique and apparatus which enables both endodontic and post-core crown build up in one procedure.

It is another object of this invention to provide a structure which enables the double sealing of root canals.

It is still another object of this invention to provide a technique and apparatus which enables the provision of a secure seal at a tooth root apex.

It is a further object of this invention to provide a combination endodontic and post-core crown build up procedure which utilizes canal syringing by controlling flow in the apical region.

It is a still further object of this invention to provide a combination endodontic and post-core crown build up procedure which avoids overfilling.

It is another object of this invention to provide a combination endodontic post-core crown build up pro-

cedure which avoids the removal of part of a root canal filler to make room for a post.

Still another object of this invention involves the utilization of a post in a post-core crown build up procedure that can be as long as the root canal thereby aiding in post retention.

A further object of this invention involves a combination endodontic and post-core crown build up procedure which avoids the usual step of taking impressions of a root canal.

A still further object of this invention involves a combination endodontic and post-core crown build up procedure which avoids fitting of a post to a root canal.

An additional object of this invention involves a post-core crown build up procedure whereby the possibility of perforating the canal when preparing it for a post is eliminated while allowing for the use of undercuts.

A still additional object of this invention involves the provision of a post for a post-core crown build up procedure which is longer than that heretofore used to increase the stability thereof by taking advantage of the root filling in order to enhance post retention.

Another object of this invention involves a technique and apparatus for a combination endodontic and post-core crown build up procedure which greatly reduces procedure or chair time.

Still another object of this invention involves the provision of a combination apical sealer element and post for core build up which may be easily and economically manufactured of conventional currently available materials that lend themselves to standard mass production manufacturing techniques.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partially schematic view in cross section of a portion of a tooth which has been prepared in accordance with the method of this invention;

FIG. 2 is a partially schematic view in cross section of a portion of a tooth illustrating the apical sealing procedure and the post-core crown build up procedure; and

FIG. 3 is a frontal view of an alternative form of the sealer portion of the apical sealer element.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention involves both an endodontic procedure and a post-core crown build up. The endodontic procedure follows generally the description of my aforementioned copending patent application with important differences as will become apparent subsequently.

The endodontic treatment of a tooth in accordance with my invention follows the usual routine at the outset and involves debridement, i.e., drilling to the nerve and removing it. At this point measurement control may be effected by x-raying the tooth with a file in place. Instrumentation for shaping and cleaning the canal comprises the next step of the endodontic procedure and is usually performed with tapered files or reamers of gradually increasing size until the walls of the canal are properly cleaned and prepared. FIG. 1 illustrates schematically a canal wherein the apical wall portion 10 has been instrumented. The canal at this point would be ready for sterilization and sealing of the apical portion under normal circumstances; however, in the practice of this invention a coronal portion 12 of the root canal is next enlarged as illustrated in FIG. 1 by means of a bur or diamond stone. The cervical re-

gion 14 of the canal is undercut next as schematically illustrated in FIGS. 1 and 2 by means of an appropriate bur in order to complete the mechanical preparation of the canal for the combination endodontic and post-core crown build up procedure. The canal may now be irrigated, i.e., flushed and sterilized and, if desired, a culture procedure may be instigated to determine the effectiveness of the sterilization.

The next step requires the sealing of the apex of the root canal and represents a departure from standard procedures other than that described in the aforementioned patent application. Since tapered files or reamers used in the instrumentation step are usually graduated and numbered to correspond to their size, and since they are utilized by gradually increasing the size to enlarge the passageway until the canal is properly cleaned and shaped, the shape and size of the apical portion 10 of the root canal is related to the last numbered file or reamer used in the instrumentation procedure. The sizes of the sealer elements or screws, therefore, are directly related to the file or reamer size, and the one chosen for a particular endodontic procedure is in accordance with the size of the last used file or reamer. The sealer element or screw 16 is to be placed in contact with the prepared canal wall at 10. If the accuracy of the placement of the element is desired to be checked, the element is first dipped in chlora percha or root canal cement and positioned within the canal close to the apex thereof as illustrated in FIG. 2. After x-raying, the element is finally positioned and the tooth is ready for the filling of the canal. X-raying for determining the position is not necessary in that the sealer element 16 of this invention has a portion thereof 18 which may be graduated to provide a gaging of the depth as a part of the structure as will be later described.

FIG. 2 illustrates one embodiment of the sealing element 16 which utilizes a sharp screw thread 20 on the frusto-conical solid of revolution forming the tapered skirt portion 22 of the element. The top 24 of the sealing screw is domed as shown in FIG. 2 in order to minimize any possible irritation of periapical tissue which may come in contact with it. Since the body fluids would be in contact with the sealing element 16, it may be made of or plated with titanium or other non-reactive material at portion 24 or also along the tapered skirt portion 22. It should be noted that the dimensions of the screw are directly related to the last used instrumenting file. The sharp thread 20 along the tapered portion 22 is utilized to engage the dentinal wall structure of the root canal.

If a threaded engagement with the wall of the canal is not deemed desirable, the embodiment of the sealing element or plug 16a, shown in FIG. 3, may be utilized. The thread 20 of the embodiment of FIG. 2 is eliminated and has a gutta percha O-ring 20a in a groove 26 in the tapered body or skirt portion 22. Chemical softening, for example, with chloroform or heating to soften the gutta percha enables a sealing action between the canal wall 10 and the skirt portion 22.

When the embodiment of FIG. 2 is utilized, a one-quarter turn clockwise is required to have the sharp thread 20 of the sealer element or screw 16 in engagement with the dentinal canal wall 10 for sealing the apex of the root canal after the screw is positioned.

The sealer elements 16 and 16a have attached to the bases 28 thereof a tapered post portion 18. The element and post structures may be made separately and

later joined or they may be manufactured as a unitary, integral structure. The post is tapered and has on its outer periphery either indentation or projections as illustrated at 30, 32 and 34 which enable the intimate bonding of any material in contact with the post 18 such that it forms a matrix for the crown form. Although particular configurations for 30, 32 and 34 are shown in the post, any means for roughing the area to enable engagement by the root canal filler would be adequate. Additionally, the indentations or projections could be located to form a graduation of the post for its utilization as a depth gage. Also, numerical values could be applied for calibration in accordance with depth for facilitating proper placement of the sealer element.

After placement of the combined sealer element 16 or 16a and post 18, the root canal is syringed with liquid root canal filler 36 into the apical region of the canal. The coronal portion 12 with the undercut at 14 is next packed with an acrylic or epoxy resin or amalgam as illustrated by the numeral 38 in FIG. 2. The basic core form 40 for the crown is either brushed on with liquid acrylic or other resin or adaptic such as an epoxy resin is packed around the exposed portion of the stump of the shaft 18.

It is optional as to whether the incisal excess of shaft 18 is snipped to length prior to the core form build up or whether it is done as part of the final step which is performed after the core form material has hardened. The bulk of the resin crown form is shaped for crown preparation as illustrated by the dashed lines in FIG. 2 by means of an appropriate bur or diamond stone. Conventional crown placement procedure is then followed.

Although the invention has been described with reference to particular embodiments, it will be understood to those skilled in the art that the invention is capable of a variety of alternative embodiments within the spirit and scope of the appended claims.

What is claimed is:

1. A method for endodontically treating a tooth in combination with a post-core crown build up procedure comprising the steps of

debridement of the nerve canal of said tooth, said nerve canal having an apex, coronal and cervical regions,

cleaning and shaping the nerve canal with instruments of gradually increasing size,

placing a sealing element having a sealing portion of substantially the same size and shape as the apex of said canal at the apex of said canal, said sealing element having a post portion which extends from the apex through said canal beyond the cervical region thereof,

syringe filling a liquid root canal filler into the apical region of said canal,

packing the coronal region of said canal around said post portion with a filling material,

applying a hardenable material around the exposed portion of said post which extends beyond the cervical region of said canal, and trimming and shaping said material and post for receipt of a crown.

2. A method as defined in claim 1 wherein said cleaning and shaping step includes enlarging the coronal region of said canal.

3. A method as defined in claim 2 wherein said cleaning and shaping step includes placing an undercut in the cervical region of said canal.

5

4. A method as defined in claim 1 wherein said step of placing a sealing element involved a threaded engagement of said element with the wall of said canal.

5. An apical sealing element for sealing the apex of a tooth root canal which has been instrumented to a predetermined size at said apex while providing a post for a post-core crown build up comprising a frusto-conical solid of revolution of a size corresponding to the dimensions of the apical end of said root canal,

means on the outer periphery of said frusto-conical solid of revolution and projecting therefrom for sealing said solid of revolution to the apical end of a root canal, and

means at the larger end of and integral with said solid of revolution forming a post for a post-core crown build up the end of said post at said solid of revolution

6

tion having a cross sectional area less than the largest cross sectional area of said solid of revolution.

6. A device as defined in claim 5 wherein said means for sealing comprises a thread around the tapered wall of said solid of revolution for engagement with the wall of said root canal.

7. A device as defined in claim 5 wherein said means for sealing comprises a gutta percha O-ring in a groove around the tapered wall of said solid of revolution.

8. A device as defined in claim 5 including a domed portion at the smaller end of said frusto-conical solid of revolution.

9. A device as defined in claim 8 wherein said element has a material inert with respect to apical fluids and tissue at said domed portion.

* * * * *

20

25

30

35

40

45

50

55

60

65