United States Patent [19]

Lentine et al.

[11] **3,924,334**

[45] **Dec. 9, 1975**

[54] **ROOT CANAL IMPLEMENT**

[75] Inventors: **Frank Nickolis Lentine,** Taylor, Mich.; **William Francis Keller,** Leawood, Kans.

[73] Assignee: **Sybron Corporation,** Rochester, N.Y.

[22] Filed: **June 21, 1974**

[21] Appl. No.: **481,524**

[52] **U.S. Cl.** **32/57;** 279/43

[51] **Int. Cl.²** **A61C 5/02**

[58] **Field of Search** 32/57, 58, 59; 279/102, 279/103, 43, 50, 57

[56] **References Cited**

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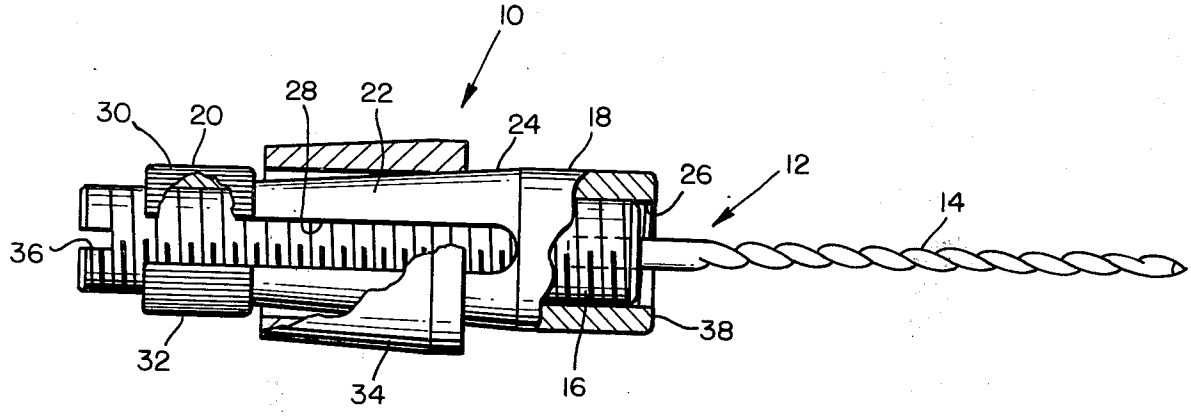
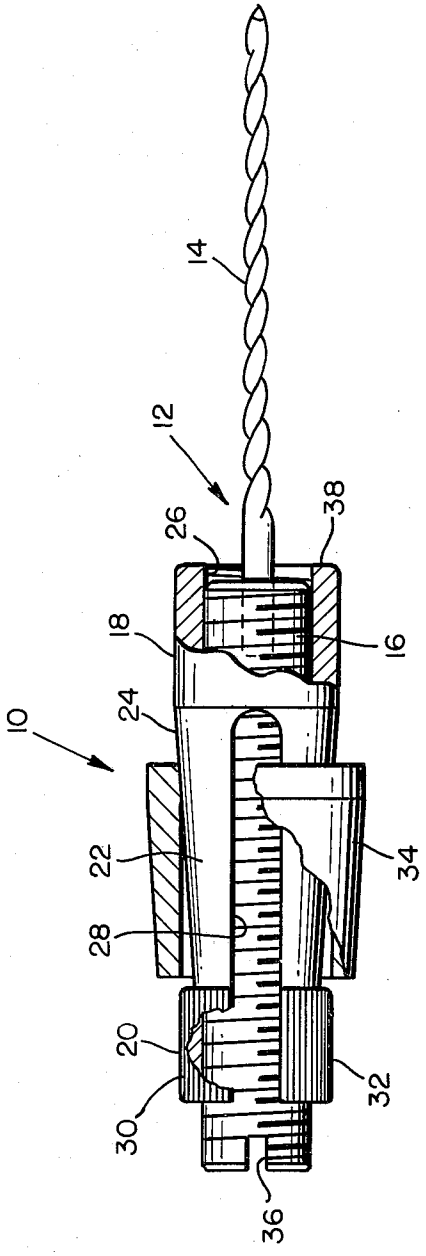
Primary Examiner—Russell R. Kinsey
Assistant Examiner—J. Q. Lever
Attorney, Agent, or Firm—Theodore B. Roessel; Roger Aceto

[57] **ABSTRACT**

A root canal implement for accepting and holding root canal files and reamers of various sizes includes a threaded knob on one end of the file or reamer wire. The threaded knob is received in the threaded bore of a split chuck handle, wherein threading the knob into the bore determines the length of the exposed file or reamer wire. A locking ring positioned over the split chuck handle constricts the chuck about the knob to prevent the knob and therefore, the wire from turning during clinical use.

3 Claims, 1 Drawing Figure

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ROOT CANAL IMPLEMENT

BACKGROUND OF THE INVENTION

The present invention relates generally to a dental instrument for root canal preparations and more specifically to a universal chuck handle capable of holding file or reamer wires of various sizes and for adjusting the operable length of the wire.

In the preparation of root canals, the present dental practice is to utilize a file or reamer wire to file or ream the root canal of a tooth. Files or reamers of various diameters and sizes may be employed. Because of the relative small diameter of the wire, the present practice is to provide a precision made handle and collar for each size wire. It is also important in the preparation of a root canal to control the length of the wire in order to limit the depth of penetration of the file or reamer and avoid injury. For this purpose, the prior art uses a variety of means including a stop movable along the length of the wire.

In the root canal instrument of the present invention, the design is such that the handle portion can accommodate wires of various sizes and has an infinite linear adjustment capability over the entire adjustment range of the wire.

SUMMARY OF THE INVENTION

The present invention may be characterized in one aspect thereof by the provision of a dental instrument for root canal uses including a file or reamer wire having one end insert molded into a threaded knob; a split chuck handle portion having a threaded bore for receiving the knob and presenting the operable end of the wire extending outwardly from one end of the handle, the threaded connection also acting as an infinite adjusting means to vary the length of the file wire extending from the handle portion; and a lock ring positionable about the handle to constrict the split portions of the split chuck handle about the knob to fix the knob and therefore the wire against both longitudinal and rotational movement.

OBJECTS OF THE INVENTION

One object of the present invention is to provide a root canal instrument wherein the handle portion of the instrument can readily accommodate all sizes of file and reamer wires.

Another object of the present invention is to provide a root canal instrument wherein file or reamer wires of different sizes may be readily attached or detached from the handle portion of the instrument.

A further object of the present invention is to provide a root canal instrument wherein the length of the file or reamer wire is infinitely adjustable over the entire range of adjustment.

Still another object of the present invention is to provide a root canal instrument having an handle portion adapted to accommodate file or reamer wires of various sizes, the means for retaining the wire fixed in the handle portion being actuated automatically during normal use of the instrument.

These and other objects, advantages and characterizing features of the present invention will become more apparent upon consideration of the following detailed description thereof when taken in connection with the accompanying drawings depicting the same.

DESCRIPTION OF THE DRAWINGS

The sole FIGURE is a side view of the root canal instrument partly broken away and in section.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawing, the FIGURE shows the root canal instrument of the present invention to include a chuck handle generally indicated at **10** and a file or reamer wire assembly generally indicated at **12.** The wire assembly includes a file or reamer wire **14,** for filing or reaming the root canal, rigidly bonded at one end to a threaded cylindrical knob **16,** so that the wire extends axially of the knob. The rigid bonding can be accomplished by any suitable means, preferably, however, the wire is insert molded into the knob. A wide range of file and reamer wire sizes are employed for root canal work so that while the diameter of wire **14** may vary, the size of the threaded knob will remain constant. The length of wire **14** protruding from the threaded knob will also be varied to provide any convenient length.

It is preferred that the material of threaded knob **16** be such that normal sterilization techniques and solutions will not effect the physical properties of the knob. It is further preferred that the material of the knob be tinted or otherwise color coded for ease of recognition of the particular size of the wire, wherein the particular color coding of the knob is related to the wire size.

Chuck handle **10** is generally cylindrical and consists of a forward portion **18,** rearward portion **20** and a intermediate portion **22.** The intermediate portion is provided with a tapered surface **24** for purposes set out herein below.

Chuck handle **10** is also provided with a threaded, axial bore **26** adapted to receive threaded knob **16.** A slot **28** which extends inward from the rear portion and through the intermediate portion of the chuck handle allows the handle to function as a split chuck wherein the upper and lower portions **30, 32** of the chuck handle, formed by the slot, can be constricted or clamped together about knob **16.** The clamping is accomplished with a lock ring **34** which is positionable about intermediate portion **22.** The internal diameter of the lock ring is less than either the forward or rearward positions **18, 20** and is such that as the ring moves toward the forward portion, the ring will engage in an interference fit with the tapered surface, so as to constrict the upper and lower portions of the chuck handle together.

In operation, the upper and lower portions of the chuck handle are squeezed together to permit passage of locking ring **34** over rear portion **20** and on to the intermediate portion. The appropriate size file or reamer wire is then selected and its knob **16** threaded into bore **26.** A slot or keyway **36** on the end of knob **16** provides a gripping surface for threading the knob the desired distance into the chuck handle. A suitable tool such as a screw driver is simply inserted into slot **36** and turned until the desired length of file wire **14** extends beyond the forward end surface **38** of the chuck handle; surface **38** representing a datum surface for the desired length measurement of file wire **14.**

Locking ring **34** is then moved toward forward portion **18** and rotated slightly to engage the locking ring against tapered surface **24.** This constricts the upper and lower portions **30, 32** of the chuck handle tightly about threaded knob **16** to lock the knob securely

therein. This locking action will prevent rotation of knob **16** while the engagement of the threads on the knob and chuck handle will prevent axially movement of the knob.

It is customary to use a root canal instrument by inserting the operative end of the instrument into a root canal to a given depth, twisting the instrument approximately **45°** clockwise and then pulling the instrument out. In the present invention, the locking action is enhanced by this normal clinical procedure in that the operator's fingers during use, are placed on or adjacent to the locking ring **34,** so that when normal pressure is applied to use the instrument, the lock ring is forced toward the forward portion of the chuck handle.

Thus, it should be appreciated that the present invention accomplishes it's intended objects in providing a dental instrument for root canal procedures wherein a single chuck handle is capable of accommodating various sizes of file or reamer wires used in root canal procedures. The chuck handle provides a means for securely holding the wire wherein the procedure for using the instrument enhances the locking of the handle to the file wire.

Having thus described the invention is detail, what is claimed as new is:

1. A root canal instrument comprising:

a. a wire to be used in filing the root canal of a tooth;

b. an externally threaded knob on one end of said wire;

c. a generally cylindrical handle having a threaded bore extending therethrough for receiving said threaded knob with said wire projecting outward from a forward end surface of said handle;

d. said handle having a forward portion, a rear portion and an intermediate portion tapering outwardly from said rear portion to said forward portion, the smaller diameter of said tapered intermediate portion being less than the diameter of said rear portion, and said handle having a longitudinal slot extending from a rearward end surface thereof through said rear portion and into said tapered intermediate portion, said slot allowing said handle to function as a split chuck; and

e. a lock ring positionable on said handle and about said intermediate portion, the inner diameter of said ring being smaller than the diameter of either said forward or rear portions so that said ring will interfere with said tapered surface upon axial movement forward for constricting and locking the rear and intermediate portions of said handle about said knob and will abut said rear portion when moved axially rearward.

2. A dental instrument as set forth in claim **1,** wherein said knob is cylindrical and said threads extend for substantially the full length thereof.

3. A dental instrument as set forth in claim **1,** wherein said knob has a transverse slot in the end thereof adapted to receive a tool for threading said knob through said bore.

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