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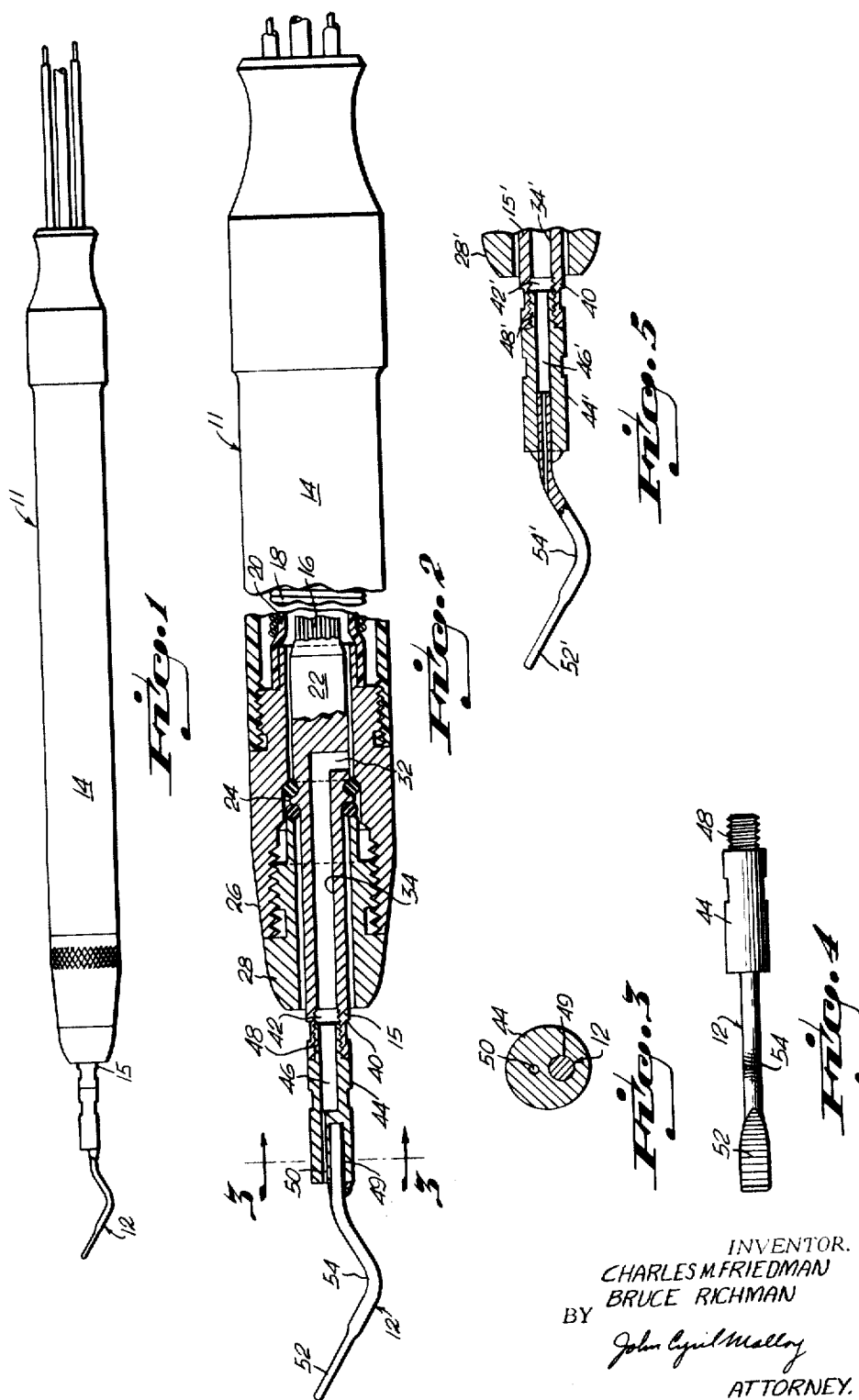
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3,368,280

DENTAL TOOL

Filed March 23, 1966

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

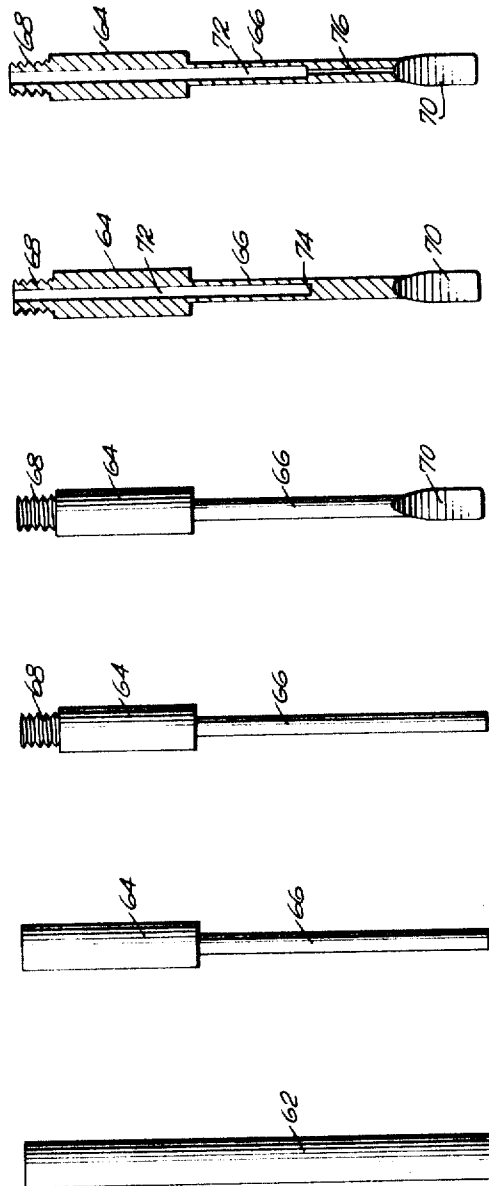


Fig. 6a Fig. 6b Fig. 6c Fig. 6d Fig. 6e Fig. 6f

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3,368,280

DENTAL TOOL

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5 Claims. (Cl. 32-58)

This invention relates to ultrasonic dental tools and, more particularly, this invention relates to a cleaning tool adapted to be connected to an ultrasonically vibrated work tool holder having fluid conduit means associated therewith, the said work tool having a fluid path through the shank thereof to provide fluid flow to the distal end thereof.

It is an object of this invention to provide a work tool for an ultrasonic dental tool having a fluid path there-through arranged to direct fluid flow passing through the shank of the tool to the distal end thereof to cool the distal end of the tool and to flow particles dislodged by the working end of the tool away from the tool.

In accordance with these and other objects which will become apparent hereinafter, the instant invention will now be described with reference to the accompanying drawings illustrating a preferred embodiment thereof.

In the drawings:

FIG. 1 is a side elevation view of an ultrasonic dental tool and having the work tool mounted thereto;

FIG. 2 is a view similar to that of FIG. 1 which has been foreshortened and broken away to illustrate the instant invention;

FIG. 3 is a view in cross section taken along the plane indicated by the line 3-3 of FIG. 2 and looking in the direction of the arrows;

FIG. 4 is a plan view of the dental tool portion of FIG. 2;

FIG. 5 is an alternative view of a dental tool similar to that of the one shown in FIGS. 2, 3 and 4 and illustrating an alternative embodiment of the instant invention;

FIGS. 6a through f are plan views to indicate the method of construction of a preferred embodiment of the dental tool.

Referring to the drawings, wherein like reference characters designate like or corresponding parts throughout the different views, and referring particularly to FIG. 1, the numeral 11 generally designates an ultrasonic tool for vibrating a work tool 12 which is mounted so that it is at all times exterior of the housing 14 of the said ultrasonic tool 11. As is apparent from FIG. 2, the said device 11 includes a tool holder 15 which comprises a laminated stack of electromagnetic material 16 arranged within a coil 18 circumposed on a jacket 20 and being connected to a transformer 22. The transformer is supported by O-ring means in the area designated 24 in the nose portion of the tubular housing and the transformer and coil and nose 26 are secured therein by a fastening means 28. It will be noted that a fluid path is provided through the main housing and that, in the embodiment shown, a fluid path is provided through the transformer or connecting body, the said fluid path comprising a radial passageway 32 which communicates with an axial passageway 34 to provide a path which is through the center of the circumferential nodal point area mounting for the transformer. The said axial passageway extends to the distal end 40 of the transformer. The distal end of the transformer is preferably provided with a threaded recess 42 into which a work tool 12 is threadably positioned in male and female relation. In the embodiments of FIGS. 2, 3 and 4, the work tool includes a shank 44 having a central axial bore 46 in the end 48 which is adapted to be received in the distal end of the transformer, and a first

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and a second bore 49 and 50 in the other end, the said first bore providing a seat for a tubular portion of a tool having a distal flattened end 52 and a dog leg bend 54 intermediate the ends thereof. The said second passageway communicates with an axial passageway leading into the fluid passage of the transformer so that the fluid flow through the device may be directed so as to impinge on the distal end of the work tool being projected through the air by fluid pressure so that the projectory of the water or fluid flow is across or in bridging relation to that of the dog leg.

In the alternative embodiment of FIG. 5, the work tool includes a main portion which is adapted to be threadably engaged in the distal end of the transformer and a tubular work tool which is provided with a dog leg intermediate a first and a second end. In FIG. 5 corresponding parts to the embodiment of FIGS. 2-5 have been designated by prime marks for clarity. The first end or the working end is flattened to a suitable configuration while the other end is arranged for insertion in the distal end of the shank portion. A passageway is provided through the shank portion so that fluid flow will impinge on the distal end of the work tool in substantially the same manner as that set forth in the foregoing description with reference to FIGS. 2, 3 and 4.

A preferred work tool is shown in FIGS. 6a through f. The structure of the work tool of FIG. 6f will best be understood following the description in this paragraph with respect to its construction. Referring to FIG. 6a, a piece of tubular stock 62 is provided and, as shown in FIG. 6b, is provided with a first main portion 64 and a second portion 66 of reduced diameter. The first main portion is provided with a threaded tip 68 of reduced diameter and the other end 70 is then flattened to define a paddle type surface. An axial hole 72 is provided from the threaded end substantially to a point 74 intermediate the length of the second portion and, from the flattened portion, a smaller axial hole 76 is drilled to meet the aforesaid hole 72. Thereafter, the tool is configured or bent so that the flattened distal end is at the proper location which is desired with respect to the other end, it being noted that the degree of bending is such so as not to constrict the fluid passageway through the tool.

It will be apparent that the instant invention provides, especially in the preferred embodiment, a simple and practical work tool adapted to be mounted to an ultrasonic dental tool and provide a cooling spray to the distal end which will serve the additional function of floating away particles dislodged by the functional effect of the said tool.

While the instant invention has been shown and described herein in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is therefore not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent apparatus and articles.

What is claimed is:

1. A work tool for an ultrasonic dental device comprising a shank portion adapted to be connected to a connecting body in the device and a single portion projecting from the shank and terminating in an angled distal work tool end, said shank having a fluid path therethrough with a mouth arranged to direct a stream of water flowing through the shank to impinge on the distal end.

2. A work tool as set forth in claim 1 wherein the said shank is provided with a first and a second recess, the said first recess comprising a seat to hold the portion and the second recess comprising a through bore to communicate with an axial bore in the shank of the tool, whereby

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a stream of water is adapted to be directed to the second bore to impinge on the distal end of the tool.

3. A work tool as set forth in claim 2 wherein said angled tool end is formed by a dog leg bend intermediate the distal end and its connection to the shank so that the stream of water bridges the dog leg in flight to impinge on the distal end.

4. A work tool as set forth in claim 2 wherein a fluid path is provided internally through some of the length of the portion with the mouth of the fluid path opening such that water flowed under pressure through the shank will impinge on the distal end.

5. A work tool as set forth in claim 2 wherein the said shank is provided with an exteriorly threaded end to connect to an ultrasonic dental tool and the portion is provided with a flattened distal end which is offset with respect to the axial center line of the shank and a first

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axial bore from the threaded end to a point intermediate the length of the portion and a second axial bore from the flattened distal end and of a diameter less than that of the first axial bore, said axial bores being in open communication with one another to provide a fluid path through the shank and portion.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,368,280

February 13, 1968

Charles M. Friedman et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 68 and column 3, lines 3, 8 and 13,
for the claim reference numeral "2", each occurrence,
read -- 1 --.

Signed and sealed this 6th day of May 1969.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer



Commissioner of Patents