

[54] **DENTAL HANDPIECE WITH BUILT-IN COOLANT DUCT**

2,442,033 5/1948 Brantly et al. 32/28

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[57] **ABSTRACT**

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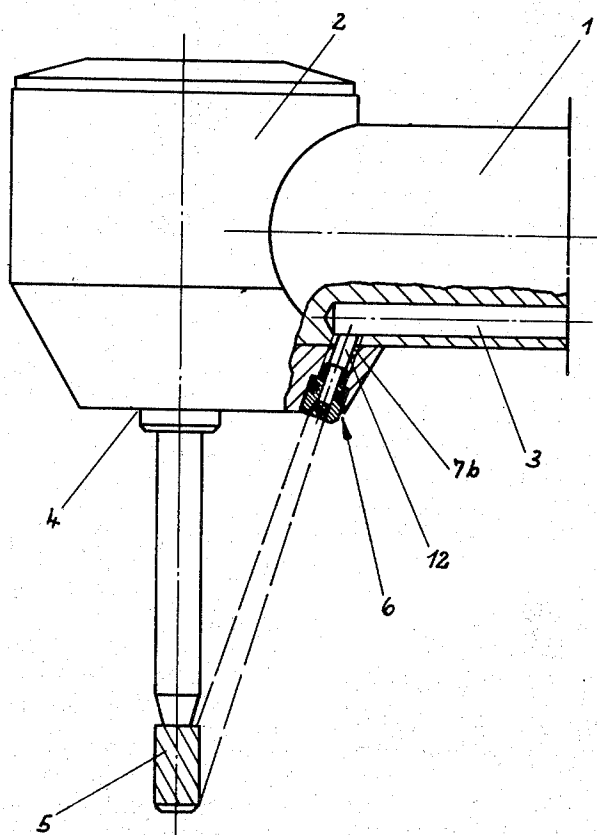
[58] **Field of Search** 32/28; 239/550, 553.3

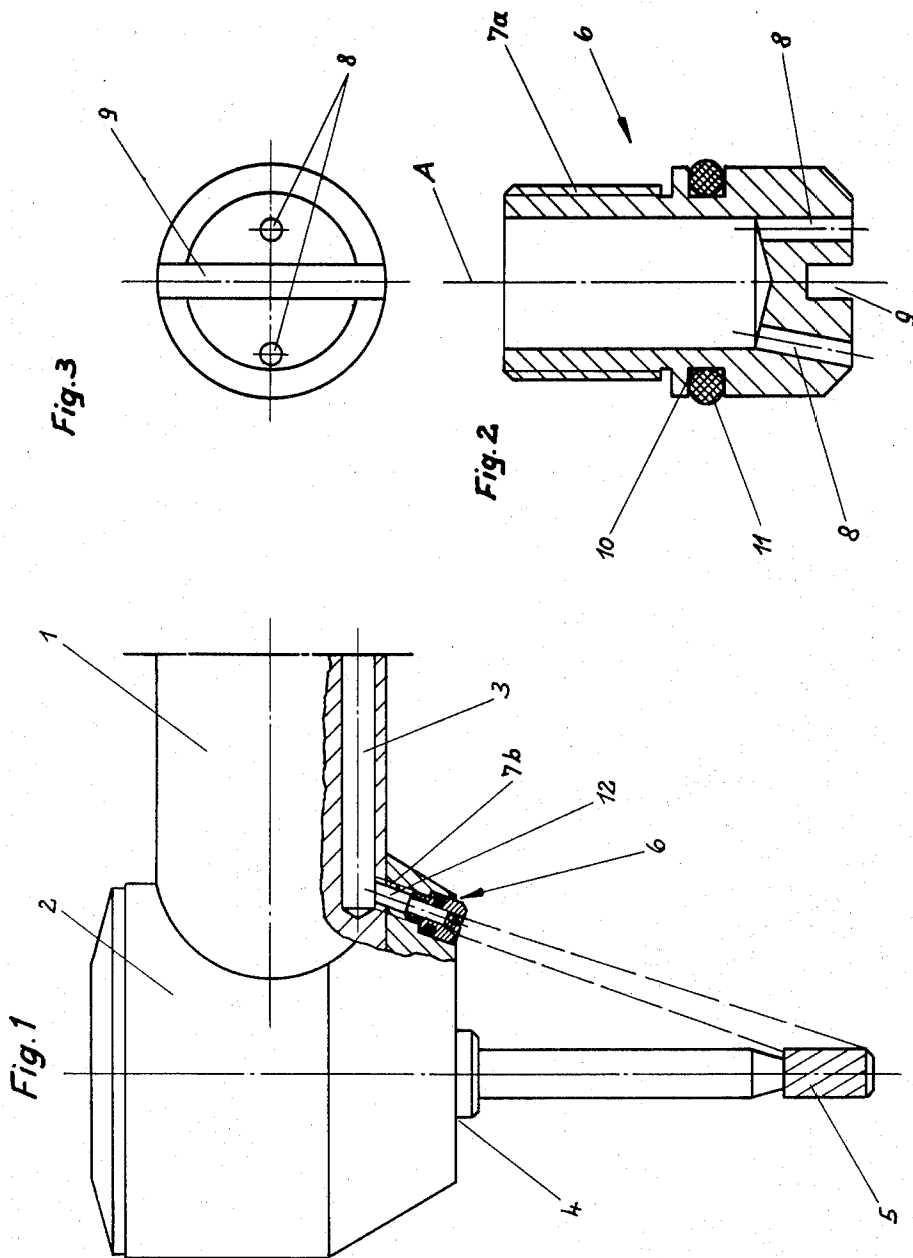
A dental handpiece comprising a portion having a built-in coolant conduit which communicates with a tubular insert which is mounted in the handpiece so as to spray coolant onto a tool fitted in the handpiece. The insert is removably mounted in the handpiece, as for example, by screw threads so as to be removable for cleaning or replacement purposes. The insert is provided with two ducts, one being oblique with respect to the axis of the insert. The insert carries a sealing member therewith and the two are inserted and removed as a unit from the handpiece.

[56] **References Cited**
UNITED STATES PATENTS

2,256,729 8/1941 Thompson 239/553.3

6 Claims, 3 Drawing Figures





DENTAL HANDPIECE WITH BUILT-IN COOLANT DUCT

BACKGROUND

a. Field of the Invention

The invention relates to a dental handpiece with at least one built-in coolant duct, which comprises, near the opening accommodating the tool, at least one tubular spray nozzle which opens into the atmosphere and is directed towards the tool.

b. Prior Art

Such a dental handpiece is known from German Auslegeschrift 1,265,340. In this arrangement, the spray nozzle is soldered fast in the handpiece. When operating the handpiece, it is unavoidable that impurities pass into the coolant duct together with the coolant and, in this duct, clog the inlet into the spray nozzles. This leads to interference in the cooling of the tool and the cooling of the tooth being treated. This defect cannot be satisfactorily avoided by the conventional procedure of pushing a thin wire through the nozzle from the outside. While this temporarily removes the internal dirt from the clogging position, the loosened dirt however always returns to the clogging position by the flow of the coolant.

SUMMARY OF THE INVENTION

An object of the invention is to provide a dental handpiece in which the above-mentioned clogging effects can be eliminated in a simple manner.

For achieving this object, it is proposed in accordance with the improvement of this invention that the spray nozzle be constructed as a tubular insert which can be releasably inserted from outside into the handpiece.

If now a clogging of the afore-mentioned type occurs, it is only necessary for the dentist to detach and remove the tubular insert, whereupon he can either easily clean the removed tubular insert or he can replace it with a cleaned tubular insert which is already prepared. The danger of the removed dirt once again reaching the former soiling position does not exist, since the dirt which is removed, thanks to the improvement, is outside the handpiece.

The construction of the spray nozzle as proposed according to the improvement of the invention can be used both with angle-shaped handpieces and straight handpieces. The improvement is suitable with any coolant, such as water, a spray consisting of an air-water mixture or coolant air or coolant gas alone.

According to a further proposal of the invention, the spraying nozzle may comprise two or more nozzle ducts. This arrangement of a plurality of nozzle ducts, as known per se, has the advantage in the present case that even several clogged nozzle ducts can easily be cleaned all at once by removing the tubular insert.

The last-mentioned constructional form provides the possibility that, in accordance with a further proposal of the invention, the axis of at least one nozzle duct extends obliquely to the axis of the tubular insert. This increases the possibility of the adjustment of several directions of spraying jets of the coolant issuing from the nozzle. Thus, it is particularly simple, by rotating the tubular insert, to adjust the spraying jet to the end region of relatively long or relatively short tools.

For the easier removal and insertion of the tubular insert, it is proposed in accordance with another embodiment of the invention to provide the tubular insert with key surfaces or the like which are accessible from outside when the insert is in the fitted position.

The key surfaces can, for example, be constructed in the form of a screw slot; similar to a nut, or in the form of key insertion holes or the like.

It is expedient, according to the invention, for the tubular insert to be screwed into the handpiece. For this purpose, the tubular insert is provided with an external thread and the corresponding receiving opening in the handpiece is provided with an internal thread.

When the tubular insert is made of suitable material, e.g. a synthetic plastic material, it is possible, for example, to obtain the necessary sealing between the tubular insert and handpiece simply by a tight screwing action. However, the construction of the spraying nozzle in accordance with the invention also makes it possible for a packing ring to be arranged in suitable manner between the tubular insert and the receiving opening in the handpiece. It is particularly desirable if, in accordance with another proposal of the invention, for the tubular insert to be provided with an external annular groove, in which a packing ring is arranged. In this case, upon the extraction of the tubular insert, the packing ring is automatically removed from the handpiece as a unit with said insert, so that the packing ring can if necessary be simply replaced.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view, partly in section, of a dental angle-piece with a spraying nozzle which can be releasably inserted and which is in the form of a tubular insert;

FIG. 2 shows only the spraying nozzle constructed as a tubular insert, in axial section and on enlarged scale; and

FIG. 3 shows the spraying nozzle according to FIG. 2 in elevation as viewed at the outlet end for the coolant.

DETAILED DESCRIPTION

Numeral 1 in the drawing represents the shank of a head 2 of a dental angle-piece. The shank 1 is capable of being releasably connected in the usual manner to a dental handpiece. The shank has a built-in coolant duct 3 which, on connection to the handpiece, is adapted to be connected to a coolant duct which is likewise built into the handpiece.

As will be seen from FIG. 1, the coolant duct 3 of the shank 1 comprises, in the vicinity of the tool-receiving opening 4 of the head 2, a tubular spraying nozzle which opens into the atmosphere and which is directed towards the tool 5.

The spraying nozzle is constructed as a tubular insert 6 which can be screwed from the outside into the handpiece or into the head 2. Hence, the insert 6 can be removed for purposes of cleaning the same of any accumulated dirt or the like, or for replacing the insert with a new one. The screwthread of the tubular insert 6 which is necessary for this purpose is shown at 7a in FIG. 2. The opening 12 of the head 2 for receiving the tubular insert has an internal thread 7b which corresponds to the external thread 7a. The spraying nozzle comprises two nozzle passages 8 which, as will be seen from FIG. 3, are arranged eccentrically of the axis A of

the tubular insert 6. Of the nozzle passages 8, the left-hand nozzle passage in FIGS. 2 and 3 extends obliquely with respect to the axis A of the tubular insert 6.

The tubular insert 6 is provided with a key surface 9 which is accessible from the outside in the fitted position, said surface being in the form of a slot.

The tubular insert is provided with an external annular groove 10, in which a packing ring 11 is arranged. Hence, removal of the insert is accompanied by removal of ring 11 therewith.

Instead of being capable of being screwed in, as shown in FIG. 2, the tubular insert 6 can also be so designed that it can be fitted so as to latch in the receiving opening 7b. For this purpose, it is possible, for example, to provide on the tubular insert 6 an external spring ring which snaps into a corresponding internal annular groove of the opening 7b. In this case, the key surface of the tubular insert 6 can be constructed as a projection extending radially beyond the periphery of the tubular insert and arranged on the lower end of the tubular insert 6 in FIG. 2.

What is claimed is:

1. A dental handpiece comprising a head portion having at least one built-in coolant conduit and a tool-receiving opening, at least one tubular spraying nozzle mounted in said head portion, said nozzle opening into the atmosphere for directing coolant onto a tool mounted in the tool-receiving opening of said head portion, said spraying nozzle being constructed as a tubular insert which is releasably inserted into the head portion from outside at a location offset from said tool-

receiving opening, sealing means carried by said insert for being inserted therewith into said head portion or removed therewith from said head portion, said insert having a main central passage which registers with said coolant conduit in the head portion when the insert is mounted in the handpiece, and two ducts extending from said central passage for conducting coolant to said tool, one of said ducts extending parallel to said passage the other obliquely of said passage.

2. A dental handpiece as claimed in claim 1 wherein said tubular insert is turnably mounted in said head portion such that by turning the insert the zone of impingement of the coolant flow onto the tool can be adjusted.

3. A handpiece according to claim 1, wherein the tubular insert is provided with a slot which is accessible from outside in the inserted mounted position of said tubular insert to enable removal thereof.

4. A handpiece according to claim 1, wherein the tubular insert and the receiving opening of said head portion are threaded so that said insert is capable of being screwed into the handpiece.

5. A handpiece according to claim 1, wherein the tubular insert is provided with an external annular groove, said sealing means comprising a packing ring arranged in said groove.

6. A handpiece according to claim 1 wherein said insert when fitted in the head portion extends at an angle to said coolant conduit.

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