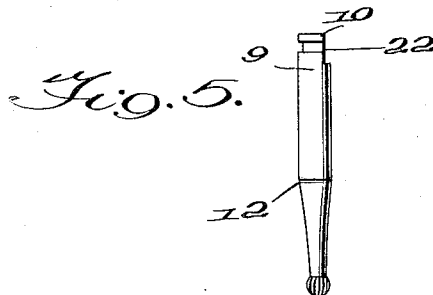
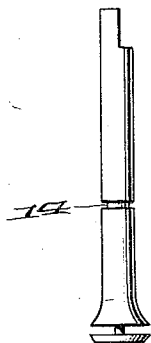
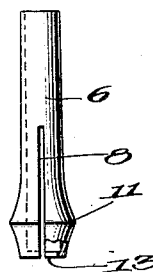
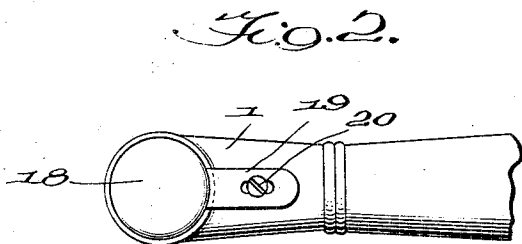
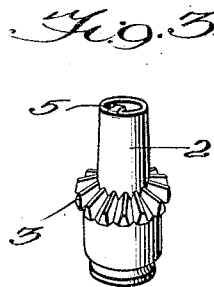
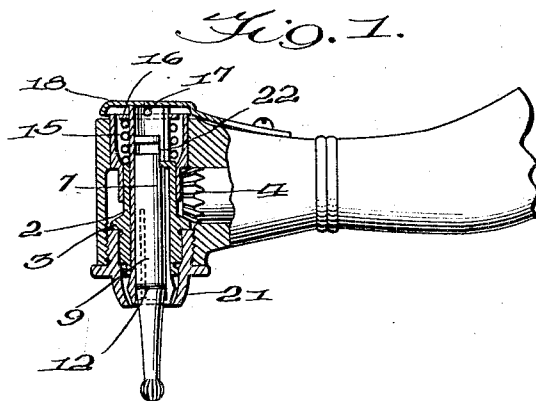


April 12, 1932.

P. R. SKINNER
ANGLE DENTAL HANDPIECE

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Inventor

Perry R. Skinner
[Signature]

By

Attorney

UNITED STATES PATENT OFFICE

PERRY R. SKINNER, OF AMSTERDAM, NEW YORK

ANGLE DENTAL HANDPIECE

Application filed February 12, 1931. Serial No. 515,286.

This invention relates to means for detachably connecting a tool to an angle dental handpiece.

In devices for the purpose as commonly constructed, the attaching means are so formed and disposed that constantly during the rotation of a tool in use friction is imposed upon the attaching means. This is because the usual fastening means is attached to a non-rotatable part of the handpiece, and projects into a circumferential groove in the rotating tool or otherwise engages the tool. Consequently, after any considerable use, the securing means becomes worn by reason of frictional contact with the tool, the tool is less rigidly held, and finally the securing means becomes inoperative. Any loosening of the tool in its holder allows of more or less wobbling of the tool and impairs its effectiveness, and frequently in practice, because of the wearing out of the attaching means, a tool is released in the mouth of a patient being operated upon, and there is danger of the tool lodging in the throat of the patient or of being swallowed.

The principal object of the present invention is to provide means for detachably securing a tool in an angle dental handpiece, whereby when in use the tool is directly secured to the parts by which the tool is rotated, thus dispensing with any intermediate device upon which friction is imposed. Further objects are to provide attaching means of the kind described in which a tool may be either secured or released by easy and rapid manipulation of the parts employed, and which is adapted for use in connection with tools having the standard form of shank. Another object is to provide attaching means which shall positively engage a tool, when the latter is in position for use, in a manner to avoid accidental withdrawal of the tool.

The invention resides in the various generically and specifically novel features of construction and arrangement of parts substantially as hereinafter described and claimed.

One form of embodiment of the invention is illustrated in the accompanying drawings.

Figure 1 is a central vertical sectional view of the head of an angle handpiece, having

therein the novel means for attaching a tool, a tool being shown in attached position.

Figure 2 is a top plan view of a head, showing the cap by which the attaching means is released.

Figure 3 is a perspective view of the rotatable sleeve through which extends a cylindrical clutch by which a tool is detachably held, the sleeve having a bevel gear thereon.

Figure 4 is a side view of the cylindrical clutch by which a tool is received and detachably held.

Figure 5 is a side view of a dental tool having a shank of the standard form.

Figure 6 is a side view of a mandrel of a form to be engaged by the improved attaching means.

Figure 7 is a view showing a modified form of the top of the clamping member.

In the drawings the head of a dental angle handpiece is indicated by 1, and 2 indicates the usual rotatable sleeve, mounted in the head, and which has, usually integral with it, a bevel pinion 3. Rotation of the sleeve is effected through a bevel gear 4, suitably driven, and meshing with the pinion 3. Extending into the sleeve is a projection 5, which engages a tool receiving and engaging member 6 when the latter is in position to extend through the sleeve, to cause the two parts to rotate in unison.

The tubular member 6, which in use is located in and projects through the sleeve 2, is made of resilient metal, is provided with the slot 7 which extends from end to end of the member, receiving the projection 5 from the collar 2, and which also is provided at one end with one or more slits 8 which permit of the easy expansion and contraction of such end. This slotted end is normally flaring in order to permit of the ready introduction of the shank 9 of the tool 10, and it terminates in an enlargement or collar 11 which abuts against the lower end of the rotatable sleeve 2 to limit the movement of the tubular member upwardly through the sleeve.

The shank 9 of the standard dental tool is abruptly reduced at its operative end, forming a circumferential shoulder 12. In complement with this form of shank the extreme

end of the clamping member 6 is formed with inwardly extending lips or extensions 13, which project substantially at right angles to the inner face of the member. The relative disposition of the respective parts is such that when a tool is introduced into the handpiece, in a position for use, the lips or extensions of the clamping member, when in engaging locations, assume positions immediately below the shoulder 12 of the tool shank, and thus positively secure the tool in a manner to prevent withdrawal.

A dental mandrel, such as shown in Figure 6, which usually has a smooth cylindrical shank, can readily be adapted for use in connection with the described securing means by providing it with a circumferential recess 14, so located as to be entered by the lips or extensions when the mandrel is operatively introduced into a handpiece.

Interposed between the rotatable sleeve 2 and the cylindrical member 6 is a spring 15 the function of which is to maintain the parts in the positions shown in Figure 1 of the drawings; that is, with the member 6 drawn into the sleeve in a manner to contract the flaring end of such member. Any suitable form of spring may be used for the described purpose, and it may be disposed in various positions. As herein shown, it is in the form of a coil, one end of which bears on the upper end of the sleeve 2 and the other end against the lower face of a disk 16 suitably secured to the upper end of the member 6. The disk has a central opening receiving the member 6, and is held in place by a pin 17 passing through the upper portion of the wall of the member, and having its projecting ends bearing on the upper face of the disk. In placing the spring in position, it is put under tension by compressing it, in order that it may function normally to maintain the member 6 in a position with its lower end drawn into the sleeve, and, therefore, contracted.

When it is desired to move the flaring lower end of the member 6 downward to free it from the sleeve 2 and permit such end to expand, it is necessary to apply a small amount of force to the upper end of the member to overcome the tension of the spring 15. As a convenient means of accomplishing this movement a cap 18 having a spring arm 19 is secured to the head 1 of the handpiece by a screw 20, extends over the upper end of the member 6, and contacts with the latter.

The cap 18 not only serves when depressed to give the required movement to the member 6, but also covers and protects from dirt the upper end of the opening in the head in which the working parts of the devices are located, and gives the head a finished appearance.

The rotatable sleeve and the clamping member are retained in the head 1 by a screw

plug 21 having an opening therethrough for the passage of the shank of a tool.

The rotation of a tool which, in the standard form, has an indentation or flattened portion 22 at its end is effected in unison with parts of the form hereinbefore described, by the juncture effected by the engagement of the projection 5 of the sleeve 2 with this flattened portion when the tool is introduced. But, as various constructions may be used for properly causing such rotation, the invention is not limited in this regard. For instance, as shown in Figure 7, the connection between the parts may be made by forming the upper end of the member 6, with an inwardly extending portion 23, of a shape to conform to the flattened portion 22 of the tool, in order that when the tool is properly seated the sleeve, clamping member and tool will be so connected as to rotate in unison.

From the foregoing description the operation of the securing means will readily be understood. When it is desired to introduce, for use, a tool into the head, to be rotated by the described means, the cap 18 is depressed, causing the flaring end of the member 6 to protrude beyond the sleeve 2. In this position the end of the member expands, allowing the ready introduction of the shank of a tool. The tool is introduced in a position to cause the indentation 22 in the upper end of its shank to receive the projection 5 extending from the rotatable sleeve 2 and projecting into the member 6, insuring the positive rotation of the tool with the parts into which the shank is introduced. When the tool is thus positioned, pressure on the cap is released and the spring acts to draw the flaring end of the member into the sleeve, in which position such end acts as a clamp to hold the tool against removal.

When the tool is released from the clamp by depressing the cap 18, the easy removal of the tool is insured, irrespective of the presence of rust on its shank due to contact with saliva when in use or of the application to it of sterilizing fluid, for the reason that the freeing of the clamping end of the member 7 immediately results in its expanding and separating itself from the shank of the tool.

The securing means, which is simple and positive in its operations to hold and release a tool, presents means for securing a tool in place for use, which is free from the many objections to such means as heretofore constructed. Inasmuch as none of the means for holding the tool is subject to wear, the life of the device is practically unlimited.

I claim:

1. A dental handpiece, comprising a rotatable reciprocatory tool-receiving member, means for causing a tool to rotate with the member, the member being provided with means for clamping a tool, and a spring for

moving the member and operating the clamping means.

2. An angle dental handpiece, comprising a rotatable reciprocatory tool-receiving member, means for causing a tool to rotate in unison with the member, the member being provided with means for clamping a tool, a spring for operating the clamping means, and means for releasing the clamping means.

3. An angle dental handpiece, comprising a rotatable sleeve, a reciprocatory tool-receiving member extending through the sleeve and rotatable therewith, means for causing a tool to rotate with the member, the tool-receiving member being provided with clamping means consisting of a flaring compressible portion normally larger than the opening in the rotatable sleeve, a spring interposed between the sleeve and the tool-receiving member and acting to draw the flaring portion into the sleeve, and means for moving the member in a direction opposite to that induced by the spring.

4. A dental handpiece, comprising a rotatable sleeve, a reciprocatory tool-receiving member extending through the sleeve and rotatable therewith, means for causing a tool to rotate with the member, the tool-receiving member being provided with clamping means consisting of a flaring compressible portion, normally larger than the opening in the rotatable sleeve, and a spring for moving the tool-receiving member to operate the clamping means.

5. A dental handpiece, comprising a rotatable sleeve, a reciprocatory tool-receiving member extending through the sleeve and rotatable therewith, means for causing a tool to rotate with the member, the tool-receiving member being provided with clamping means consisting of a flaring compressible portion, normally larger than the opening in the rotatable sleeve, a spring for moving the tool-receiving member to operate the clamping means, and a plate contacting with the member, and adapted when pressed to move the member in a direction opposite to that imparted by the spring, for releasing the clamping means.

6. A dental handpiece, comprising a rotatable sleeve, a reciprocatory tool-receiving member extending through the sleeve and rotatable therewith, means for causing a tool to rotate with the member, the tool-receiving member being provided with means for engaging a tool having a circumferential groove, consisting of a flaring compressible portion, having inwardly extending projections, normally larger than the opening in the rotatable sleeve, and a spring for moving the tool-receiving member to operate the engaging means.

In testimony whereof I affix my signature.
PERRY R. SKINNER.