

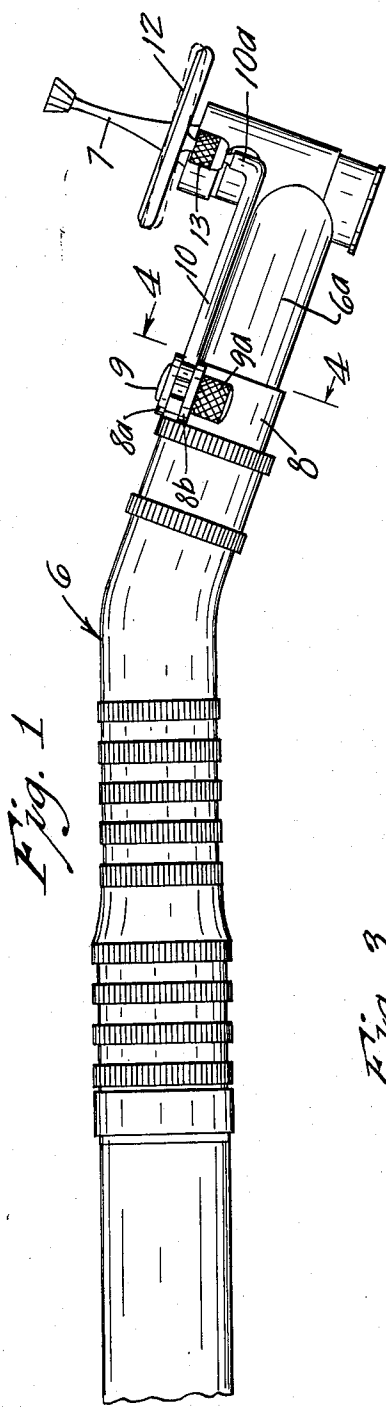
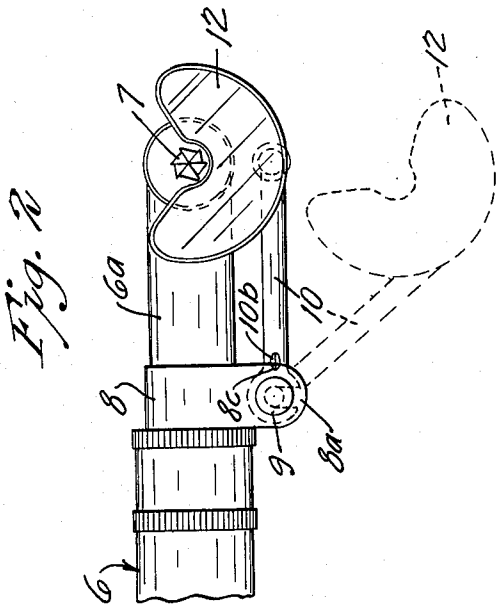
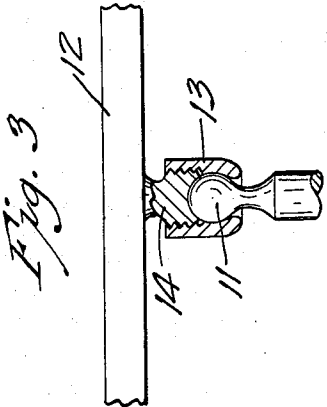
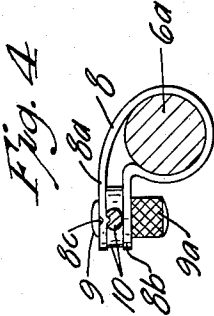
May 25, 1954

N. R. ERICKSON

2,679,103

MIRROR ATTACHMENT FOR DENTAL DRILLING TOOLS

Filed Oct. 30, 1952



Inventor

Norman R. Erickson
By
Williamson, Williamson, Schroeder & Adams
Attorneys

UNITED STATES PATENT OFFICE

2,679,103

MIRROR ATTACHMENT FOR DENTAL
DRILLING TOOLS

Norman R. Erickson, Minneapolis, Minn.

Application October 30, 1952, Serial No. 317,762

5 Claims. (Cl. 32-69)

1

This invention relates to a mirror attachment for dental drilling tools particularly designed to facilitate cutting in portions of a patient's teeth not directly visible for inspection.

It is absolutely necessary for dentists to inspect the cavities during the drilling operation to prepare the same. This is relatively easy when the drilling is being done in teeth disposed in a position which is readily visible for direct inspection, but it is difficult and requires the use of a reflective surface such as a hand mirror or the like when the drilling is done, for example, in the upper teeth. If a separate mirror is used, the drill must be removed from the patient's mouth and the mirror inserted therein for the inspection and then the drill reinserted for subsequent drilling.

It is an object of my present invention to provide a mirror attachment for drilling tools adapted to permit inspection of the cavity being prepared without removing the drilling tool from the patient's mouth to obviously greatly facilitate the cutting operation in portions of a patient's teeth not directly visible without the aid of a mirror and particularly the upper teeth.

Another object is to provide a reflective member adapted to be removably attached to a drilling tool to facilitate inspection of a cavity being prepared during the drilling operation thereon without requiring removing of the drilling tool from the mouth of the patient, and also permitting said reflective member to be easily and quickly removed from the drilling tool as when drilling in teeth where direct visual inspection is permitted, as in the lower jaw, and also when the reflective member is to be sterilized after use.

More specifically, it is an object to provide an easily removable, swingably mounted reflective member attached directly to a drilling tool to permit visual inspection during the drilling of even the posterior upper teeth and wherein the reflective plane is adjustable relative to the axis of the drilling burr and which is adapted to be instantly shifted into a retracted position removed from said burr to facilitate cleaning of the reflective surface thereof.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

Fig. 1 is a fragmentary side elevational view of a dental hand piece with a contra-angle attachment thereon and showing my reflective member attached to the contra-angle in operative position;

2

Fig. 2 is a top plan view of the forward portion of the contra-angle with the mirror shown in operative position by full lines and in retracted position by dotted lines;

Fig. 3 is a fragmentary vertical sectional view showing in detail the connection of the mirror to the mounting arm; and

Fig. 4 is a transverse sectional view taken substantially along the line 4-4 of Fig. 1 and showing the attachment of the mounting arm to the forward portion of the casing of the contra-angle.

As illustrated in the accompanying drawings, I provide a conventional dental hand piece with a conventional contra-angle 6 mounted thereon. The contra-angle 6 is adapted to removably receive a drilling burr 7 in the free end thereof in the conventional manner and has a casing 5a extending rearwardly from the burr mounting portion thereof, as best shown in Figs. 1 and 2.

Suitable mounting means are provided for my mirror attachment such as the mounting clamp 8 which surrounds the rear portion of the contra-angle casing 5a. As best shown in Figs. 1 and 4, this clamp 8 is constructed with a pair of vertically opposed attachment ears 8a and 8b having a pair of aligned apertures respectively formed therethrough. An attachment pin 9 extends through said apertures and has a threaded lower portion on which a clamping nut 9a is mounted.

A swingable arm 10 is pivotally mounted at one end on said pin 9 and in the form shown has a slot formed in the mounting end portion thereof, as best shown in Fig. 2, which slot is open on the outer end thereof when said arm is disposed in operative position as shown in Figs. 1 and 2. The arm 10 has a right angle bend formed in the outer portion thereof to produce an upstanding mirror connection portion 10a on which a connecting ball 11 is fixed. A reflective member such as the mirror 12 is connected with said ball in a manner to permit the reflective plane of the mirror to be adjusted relative to the axis of the ball and the upstanding arm portion 10a, as best shown in Fig. 3. This mounting is provided by a retaining sleeve 13 having a ball receiving socket formed in the lower end portion thereof and being internally threaded at its upper end. The mirror 12 has a depending connection element 14 with a ball receiving recess at the lower end thereof and is externally threaded to be threadably received within the upper threaded portion of the retaining sleeve 13, and the recessed portion thereof completing the ball and socket joint on which the tension can of course, be adjustably varied by the threaded connection

3

between said sleeve and said depending member 14.

The position of the two ears 8a and 8b of the mounting clamp 8 permits the arm 10 to be mounted for swinging movement in a plane disposed at least slightly above the top of the contra-angle casing portion 6a, as best shown in Figs. 1 and 4. This, of course, permits easy engagement of the arm 10 by the thumb or finger of the dentist to swing the mirror outwardly away from the burr 7. For this reason there is a slot formed in the mirror which in the form shown is substantially V-shaped and produces a substantially kidney-shaped mirror, as best shown in Fig. 2. The shape of the mirror is, of course, merely arbitrary. Suitable means for retaining the arm 10 in operative position may be provided such as the recess 10b formed in the portion thereof disposed directly below the ear 8a and said ear has a depending projection 8c extending therebelow to be received in the recess 10b of the arm to yieldably hold said arm in operative position with the mirror disposed in close association to the base of the burr 7 as best shown in Fig. 2, but permitting said mirror to be easily swung into retracted position as shown by the dotted lines of Fig. 2.

Obviously the attachment of the clamp 8 to the casing portion 6a of the contra-angle is relatively easy and the pin 9 and clamping nut 9a securely hold the same in tightly clamped relation when the arm 10 is mounted thereon. It is of course perfectly possible to provide additional retaining means for separately holding said clamp pin onto the casing portion 6a but this is not thought to be necessary.

The following is a description of the operation of my mirror attachment for drilling tools. When the mirror has been attached to the contra-angle casing portion 6a and the mirror disposed in operative position as shown in Fig. 2, the reflective plane of the mirror can be easily adjusted relative to the axis of the burr 7 to permit the cavity in the upper tooth being prepared to be easily viewed simultaneously with the preparation thereof, thus saving considerable time in the drilling operation and eliminating "cutting by feel" which was previously necessary when drilling in the upper teeth and in the portions of the lower teeth not readily visible for direct inspection. Whenever the reflective surface of the mirror has become clouded, said mirror may be shifted quickly into retracted position away from the burr 7 to permit easy wiping and cleaning thereof and quickly returned into operative position in substantially adjacent relation to the base of the burr 7. With the opening of the slot at the connection end of the arm 10 being disposed generally outwardly when said arm is in operative position as best shown in Fig. 2, outwardly directed retracting pressure against the arm 10 will not tend to remove said arm from the pin, but the open ended attachment slot also permits easy removal of the arm 10 from the pin 9 whenever the clamping nut 9a is loosened by merely swinging said arm into a retracted position and sliding the connection end off of the attachment pin 9, thus facilitating removal thereof from the contra-angle to permit sterilization of the mirror and unobstructed view of teeth which are directly visible. The recess 10b and depending projection 8c hold the mirror in operative position but permit the same to be swung into retracted position as has been previously described.

It will be seen that I have provided a relatively

4

simple yet highly efficient mirror attachment for dental drilling tools such as the contra-angle illustrated which permits the cutting operation to be constantly viewed during the preparation of a cavity in a tooth not directly visible. It should be noted that my mirror is readily retractable to facilitate cleaning and is easily and quickly removable from the contra-angle as well as being adjustable to permit the desired angular relation to be obtained between the axis of the burr and the plane of reflection. The positioning of the arm 10 for swinging movement in a plane disposed above the casing 6a of the contra-angle greatly facilitates engagement thereof to permit swinging thereof into retracted position. It should be noted that the use of the term drilling herein refers to opening of a cavity, outline of a cavity and placement of retentions, and is technically referred to in the dental profession as the cutting of a cavity.

It will, of course, be understood that various changes may be made in the forms, details, arrangement and proportion of the various parts without departing from the scope of my invention.

What I claim is:

1. A mirror attachment for dental drilling tools comprising a clamping member adapted for attachment to a drilling tool in spaced relation to the drilling burr thereof, an arm pivotally attached to said clamping member for swinging movement relative thereto and extending toward said drilling burr when in operative position, a reflective member mounted on the outer end of said arm for shifting movement therewith and having an opening therein to permit the same to be retractably mounted in operative position around at least a portion of the burr base but swingable into retracted position to facilitate cleaning of the reflective member and changing of the burr.

2. The structure set forth in claim 1 and yieldable means operatively associated with said arm and said clamping member for retaining the arm and reflective member in operative position.

3. The structure set forth in claim 1 and the mounting of said reflective member on said arm being constructed to permit the adjustment of the plane of reflection of said member relative to the axis of the burr.

4. A mirror attachment for dental drilling tools comprising an attachment member constructed to facilitate easy attachment to a drilling tool at a point in spaced relation to the drilling burr thereof, a mounting arm removably pivoted on said attachment to permit swinging movement of the arm toward and away from said burr, a mirror mounted on the outer end of said arm for shifting movement therewith and having an opening therein to permit said arm to move on its pivotal axis into operative position and into retracted position.

5. The structure set forth in claim 3, and the adjustable mounting of said reflective member on said arm having a tensioning element for varying the resistance to adjustment of the plane of said reflective member relative to the axis of said burr.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,500,798	Campodonico	July 8, 1924