June 16, 1953 R. B. BLACK 2,641,839

DENTAL HAND-PIECE

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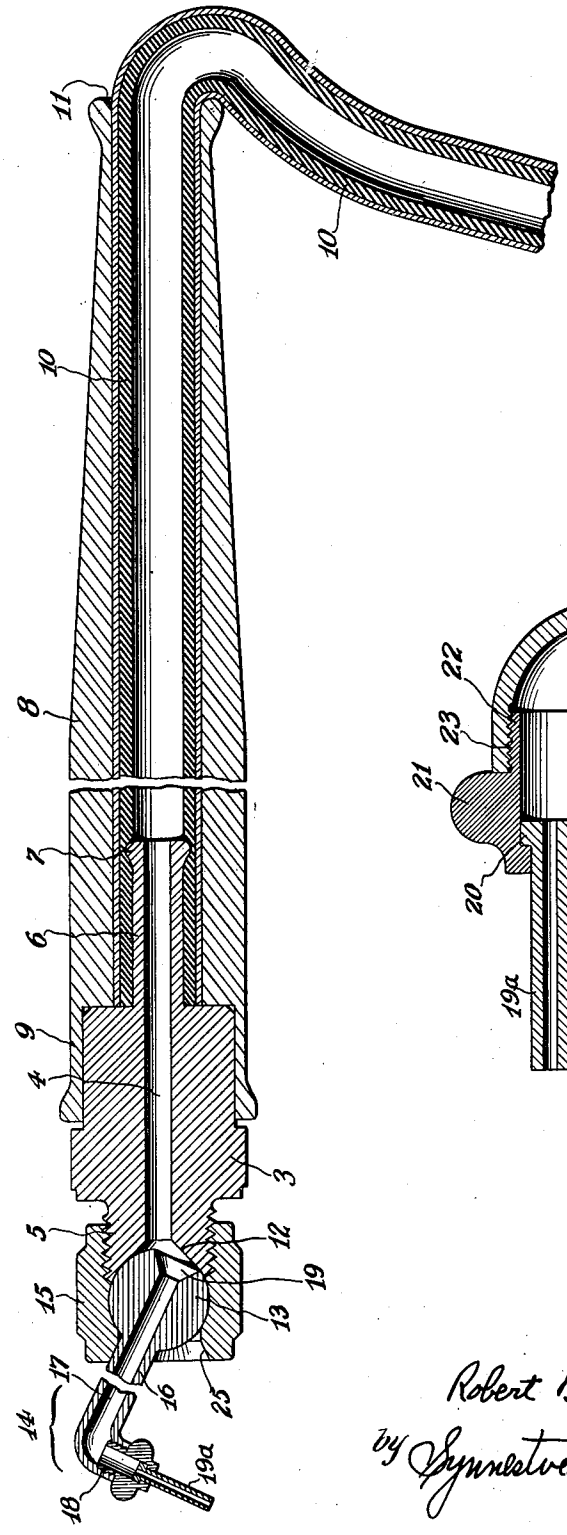

Fig. 1

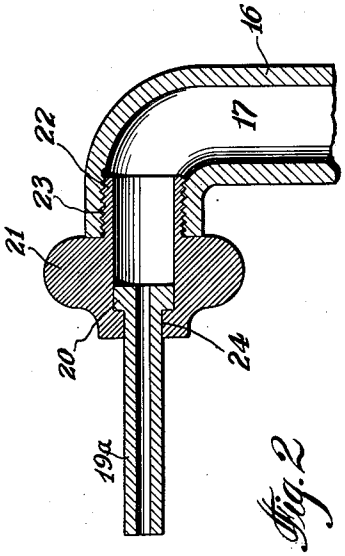

Fig. 2

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DENTAL HAND PIECE

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5 Claims. (Cl. 32—58)

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This invention relates to the art of treating teeth by means of finely powdered materials carried by a stream of gas as fully described and claimed in my copending application Serial No. 78,068, filed February 24, 1949. Specifically the invention has particular reference to the hand-piece which is used by the dentist in directing the stream against the tooth to be treated. The essential features of this hand-piece are disclosed in said earlier application but were not claimed therein in order to maintain a clear line of division between said earlier application and present case.

The principal object of the invention is to provide a dental hand-piece for the purpose described which is highly maneuverable so that the fine stream of mixed gas and powdered material can be directed with extreme accuracy to the exact area of the tooth which requires attention as, for instance, where a cavity is to be prepared for the reception of a suitable filling.

Another important object of the invention is to provide a hand-piece having an extended and firm support for the end of the flexible tube through which the mixture of gas and powder material is delivered to the instrument in order to minimize to as great an extent as possible the tendency for the flexible tube to crack or break under the flexing imposed upon it in service.

Still another object of the invention is to provide a dental hand-piece having a discharge nipple or nozzle which is quickly replaceable and the angular position of which is readily adjustable.

Another object is to provide a dental hand-piece of the character described in which the flow of the mixture of gas and powdered material is in no way impeded by changes in the angular adjustment of the nozzle structure.

How the foregoing together with such other objects as may appear hereinafter or are incident to my invention are attained is illustrated in a preferred embodiment in the accompanying drawing wherein

Figure 1 is a longitudinal section through my improved hand-piece and

Figure 2 is a longitudinal section on an enlarged scale of a portion of the nozzle structure in order to more fully illustrate certain details of the invention.

The hand-piece includes a main body or connecting member 3 having a longitudinal bore 4, a forward reduced extension 5 which is exteriorly threaded, and a rearward reduced extension 6 having a flared or beaded end 7. A tubular handle member 8 has an end 9 press fitted over the body member 3, the portion 9 having a greater interior diameter than the balance of the tube which embraces the reduced extension 6. A flexible tube 10 of any suitable construction enters through the open end of the tube member and is extended thereinto so as to fit over the reduced extension 6 with its flared end 7. In this way the flexible tube has a firm and extended support within the tubular handle member which will tend to minimize any tendency to crack or break the flexible tube during service. Additionally, the outer end of the tube may be belled slightly as at 11 in order to provide a smooth contour over which the flexible tube can bend.

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The opposite end of the body member 3 is provided with a socket-like end 12 into which is partly projected the ball 13 of the nozzle structure which is indicated as a whole by the reference character 14. The ball is held in position against the socket 12 by means of the collar 15 which is interiorly threaded to cooperate with the threads on the exterior of the extension 5. The interior of the collar is formed to cooperate with the curved surface of the ball 13 so that when the collar 15 is screwed up tight, the ball may be held firmly in any given position of adjustment by virtue of the pressure reacting between the curve of the interior of the collar and the flared socket 12 at the end of the body member.

The nozzle structure also includes an arm portion 16 having an interior passage 17 which extends rearwardly through the ball 13 and forwardly into an elbow 18, the latter preferably being formed at a right angle with relation to the arm 16. The entrance end of the passage 17 is flared as at 19 so as to provide for unimpeded flow of the mixed gas and powdered material regardless of the angular adjustment of the nozzle structure.

The discharge nipple or nozzle 19a has a collar 20 embraced by a nut member 21 which latter has a rearward extension 22 suitably threaded on its exterior to cooperate with interior threads on the elbow 18 as indicated at 23. The outer portion of the nut has a reduced interior diameter as shown at 24 which is adapted to embrace the outer surface of the discharge nipple and cooperate with the flange 20 to hold the nipple in position as shown most clearly in Figure 2.

The parts may be assembled as follows. The flexible tube is pulled through the bore of the tubular handle member 8 and is fitted over the reduced extension 6 of the body member 3. The body member and the handle member 8 are then

press fitted together as already described. Following this the arm 16 is extended through the interior of the collar member 15 until the ball 13 fits within the socket portion of the collar whereupon the collar is threaded on to the extension 5. The discharge nipple 19a is now placed within the nut member 21 which latter can then be screwed into position on the threads 23.

It should be noted that the opening in the collar 15 through which the arm 16 extends is flared as at 25 in order to accommodate angular adjustment of the arm 16 and that the ball and socket construction provides a substantially universal connection between the nozzle structure and the body of the hand-piece.

The structure I have devised is simple, rugged, relatively easy and inexpensive to manufacture and highly maneuverable in the hands of the dentist.

I claim:

1. A dental hand-piece for use in treating teeth with a finely powdered material carried by a stream of gas comprising a tubular handle portion, a flexible tube entering one end of and secured within said handle portion, said handle and tube having an extended overlapping relationship, and a nozzle structure universally connected to the other end of said handle portion.

2. A dental hand-piece for use in treating teeth with a finely powdered material carried by a stream of gas comprising a body member having a longitudial bore, a nozzle structure universally connected to one end thereof, a reduced extension on the other end, a tubular handle portion surrounding said extension, and a flexible tube entering said handle portion and fitting over said reduced extension, said handle and tube having an extended overlapping relationship.

3. A dental hand-piece for use in treating teeth with a finely powdered material carried by a stream of gas comprising a body member having a longitudinal bore, a nozzle structure having an arm with a ball at one end thereof and a discharge nipple at the other, said nipple being supported by a nut which is threaded to the end of the arm, a socket on the body member into which the ball partly projects, and a collar member embracing the ball and threaded on the body member.

4. A dental hand-piece for use in treating teeth with a finely powdered material carried by a stream of gas comprising a body member having a longitudinal bore, a nozzle structure having a ball and socket connection with one end of the body member, a replaceable nozzle discharge nipple, and a supply conduit connected to the other end of the body member.

5. A dental hand-piece for use in treating teeth with a finely powdered material carried by a stream of gas comprising a body member having a longitudinal bore, a nozzle structure having a ball and socket connection with one end of the body member, a reduced extension on the other end of the body member, a supply conduit connected to said extension, and a tubular handle member surrounding the end of said supply conduit and secured to the body member, said supply conduit and handle member having an extended overlapping relationship.

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