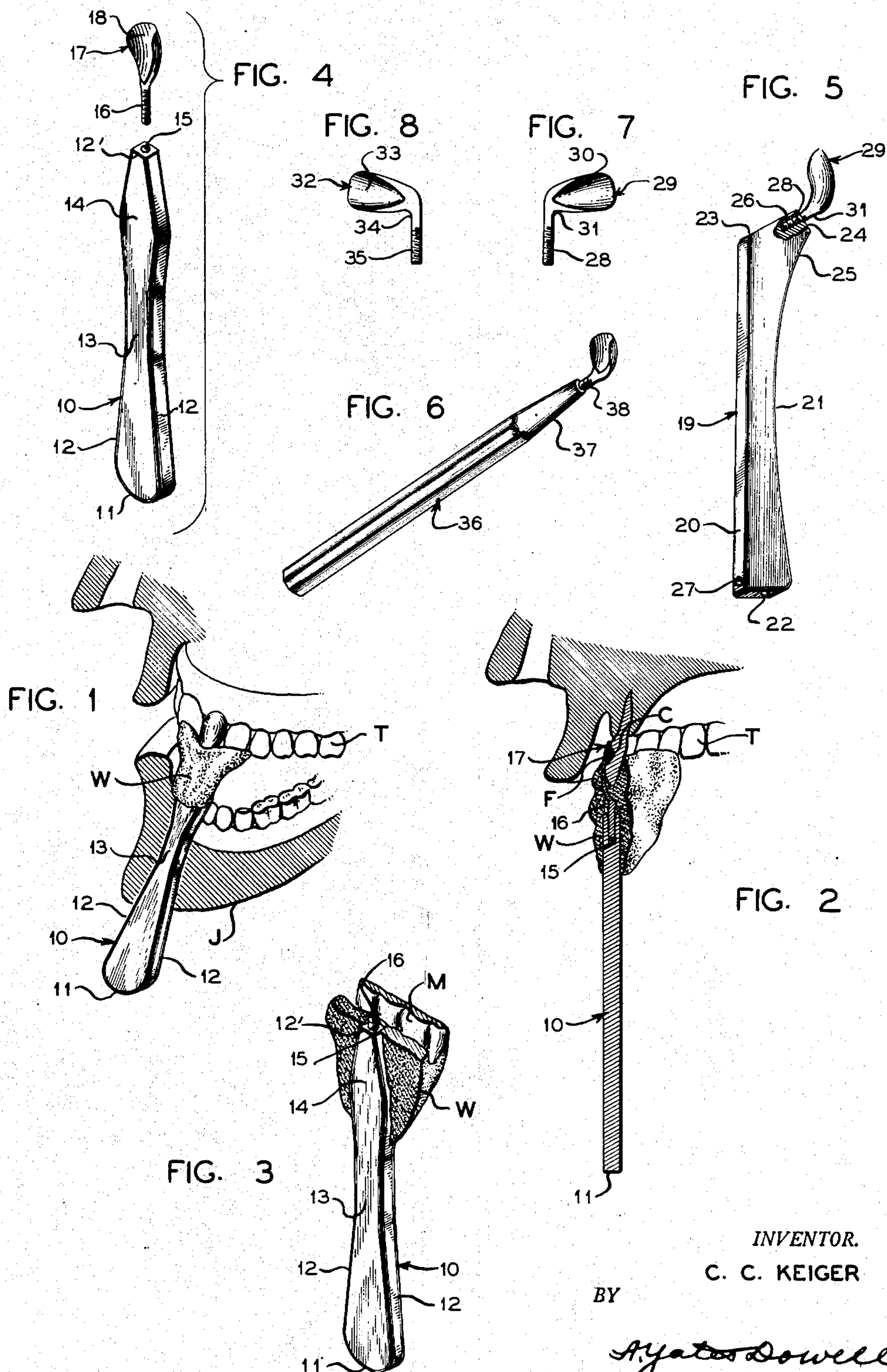


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DENTAL INSTRUMENT
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DENTAL INSTRUMENT

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1 Claim. (Cl. 32—63)

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This invention relates to dental instruments and more particularly to a novel instrument especially designed for use in connection with the filling of cavities in teeth.

The present application is primarily concerned with the filling of cavities in the labial surfaces of the teeth commonly referred to as incisors and canines and in the buccal surfaces of the bicuspids and molars.

The vast majority of fillings required for cavities of this character are formed from plastic materials. The cavity is first prepared and then the plastic material is introduced thereinto. Pressure is required to insure that the plastic material has completely filled the cavity and this pressure must be maintained constant until the plastic material has hardened, precluding any possibility of movement of the filling until the plastic material has finally set in proper position. Approximately five minutes setting time is required for the plastic materials with which we are here concerned and, during this time interval, movement of the patient's head or the dentist's instrument may result in ruining the filling. Where the cavity in question is especially close to the gum, this situation is further aggravated.

Instruments have been designed whereby appropriate pressure upon plastic fillings may be maintained, however, the successful use of such instruments depends on the ability of both patient and dentist to avoid relative movement during the setting interval.

It is accordingly a major object of the present invention to provide a novel and improved dental instrument whereby appropriate pressure may be provided with particular ease upon the labial and buccal surfaces of the teeth, to insure the proper filling of cavities therein.

It is a further object of the invention to provide a novel set of dental instruments including a plurality of selectively interchangeable spoon-shaped instruments especially designed for engagement with the labial and buccal surfaces of the teeth.

It is a further object of the invention to provide a novel dental instrument of the class set forth which will include an especially conformed handle to permit the more convenient grasping and secure retention of the instrument in the hand of the user.

It is a further object of the invention to provide a novel dental instrument of the class set forth which will include a plurality of specially conformed handles and compressors to provide

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ready and convenient access to the labial and buccal surfaces of all teeth.

It is a still further object of the present invention to provide novel locking means, for use in connection with a dental instrument of the class set forth, which will insure stability and prevent possibility of inadvertent movement of the instrument with respect to the tooth surface to which it is applied.

It is a still further object of the present invention to provide a novel dental instrument of the class set forth which may be readily used, will be particularly light in weight, will be strong and durable, and may be economically manufactured.

Further objects and advantages of the invention will be apparent from the following specification, taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a fragmentary perspective view illustrating the novel dental instrument of the present application in use;

Fig. 2, a vertical sectional view through the disclosure of Fig. 1, illustrating the instrument locked in proper position for the filling of a labial cavity in an incisor in the upper jaw, the lower jaw being omitted;

Fig. 3, a perspective view illustrating the instrument removed from the upper jaw of Fig. 2, a portion of the locking mold being broken away for the sake of clarity;

Fig. 4, a perspective view of the instrument handle and spoon-shaped compressor of Figs. 1 through 3, illustrating these parts in detached or expanded relationship;

Fig. 5, a perspective view illustrating a handle especially conformed for mounting a spoon-shaped instrument intended for use as a compressor in connection with buccal fillings;

Fig. 6, a perspective view illustrating a modified form of handle especially conformed for mounting a spoon-shaped instrument also intended for use as a compressor in connection with buccal fillings;

Fig. 7, a perspective view illustrating, on an enlarged scale, the spoon-shaped instrument designed for use in connection with fillings in the buccal surfaces of teeth located in the upper right and lower left hand sides of the jaws; and

Fig. 8, a perspective view illustrating, on the same enlarged scale, the spoon-shaped instrument designed for use in connection with fillings in the buccal surfaces of teeth located in the upper left and lower right hand sides of the jaws.

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With continued reference to the drawing, there has been disclosed in Figs. 1 and 2 the jaw J of a patient, teeth T being illustrated somewhat conventionally. One of the incisors in the upper jaw has been illustrated as having a cavity C in which there has been positioned a plastic filling F, the novel dental instrument of the present invention being shown in proper position for compressing the plastic filling during the setting interval.

The preferred embodiment of the invention illustrated includes several handle portions or members of different exterior conformation, three being illustrated. One of these handle members is primarily intended for use in connection with the filling of labial cavities while the remaining two handle members are intended for use in connection with the filling of buccal cavities.

With particular reference to Figs. 1 through 4 of the drawing, the handle 10 is designed for use in connection with labial fillings and is manufactured from any suitable relatively light weight material, being substantially flat and comparatively thin. This handle member terminates in a rounded lower extremity 11, for convenient grasping, and includes inwardly tapered side walls 12 which provide a relatively narrow intermediate portion 13 beyond which the side walls gradually flare outwardly to form an enlarged portion 14 adjacent the opposite extremity of the handle. Beyond this enlarged portion the side walls 12 taper sharply inwardly, as indicated at 12', the upper extremity of the handle member being provided with an axial bore 15, internally screw-threaded for engagement with the complementarily threaded extremity 16 of a labial compressor 17.

The compressor 17 is substantially axially aligned with the threaded extremity or stem-like shaft 16 and is preferably spoon-like in cross sectional contour to provide a concave surface 18 intended for engagement with the convex labial surface of the tooth being filled.

In the use of the dental instrument thus described, the cavity C is first prepared for filling, in the usual manner and as is well known in this profession, and the plastic filling material F is then introduced into the prepared cavity. Appropriate pressure must then be applied to the plastic filling material, to insure that the cavity is completely filled, and such pressure must be maintained constant until the material has set in final form. This pressure is provided by the concave surface 18 of the spoon shaped compressor 17 and novel locking means is provided for assuring the retention of the compressor in proper position against the labial surface of the tooth being filled.

Such locking means comprises a relatively small quantity of soft molding wax, or similar material, which is placed upon the handle member 10 in surrounding relationship with respect to the enlarged portion 13 thereof. Simultaneously with the application of pressure upon the filling F by the concave surface 18 of the compressor 17, the molding wax W is pressed into engagement with the teeth immediately adjacent to the one being filled. The wax W is immediately chilled, becoming hard relatively instantaneously and forming a rigid mold M which surrounds the handle of the instrument and locks the compressor in proper angular relationship upon the plastic filling. Manual separation is then required, to remove mold and instrument from the patient's mouth, it being particularly

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simple to permit the device to remain in position the necessary time interval required for the setting of a plastic filling, without any discomfort to the patient. The mold is then removed from the handle, without difficulty, and discarded, the instrument being ready for further use.

In practice it has been found particularly convenient to place the spoon-shaped compressor 17 against the tooth surface, after the cavity has been prepared. The wax mold is then prepared and the instrument removed from the patient's mouth. Plastic filling material is then inserted into the prepared cavity and the locking mold engaged with the appropriate teeth. Mold and compressing instrument will remain securely in position, exerting proper pressure against the plastic filling until such material has set in desired position, at which time the instrument is removed and thereafter the mold is discarded.

A substantially identical process is employed in connection with the filling of cavities in the buccal surfaces of bicuspid and molars, it being necessary to provide appropriately contoured compressors and, preferably, differently shaped handles to permit of maximum ease of operation.

To this end there has been provided an especially conformed handle member 19, manufactured from any suitable relatively light weight material, intended for use in connection with the filling of cavities in buccal surfaces. Like the handle member 10, the handle 19 is substantially flat and comparatively thin. As will be more readily apparent from an examination of Fig. 5 of the drawing, the handle 19 includes a relatively straight side wall 20, a gently arcuate opposite side wall 21 providing an enlarged base portion adjacent the bottom wall 22, and angularly disposed top walls 23 and 24 providing, with the upper extremity of the side 21, an angularly offset extremity 25. The end wall 24 of this offset extremity is provided with an internally screw-threaded bore 26 intended for engagement with the complementarily threaded extremity 28 of a buccal compressor 29. A similar internally screw-threaded bore 27 is provided in the side wall 20 of the handle 19 immediately adjacent the enlarged base portion, intended for selective engagement with the complementarily threaded extremity 28 of a buccal compressor, as will be hereinafter more fully described.

A minimum of two buccal compressors are required, oppositely conformed for use upon teeth upon the left and right hand sides of the jaws. Such a problem is not present in connection with the labial compressor which functions with identical accuracy upon both top and bottom teeth. Two such buccal compressors are illustrated in Figs. 7 and 8 of the drawing.

Referring first to Fig. 7, the compressor 29 is preferably spoon-like in cross sectional contour to provide a concave surface 30 intended for engagement with the convex buccal surface of the tooth being filled. A goose neck 31 is provided, between the compressor 29 and the threaded extremity or stem-like shaft 28, the compressor being angularly disposed with respect to said extremity. This buccal compressor, which is illustrated in Fig. 5 as positioned in the angular extremity of the handle 19, is intended for use in connection with the filling of cavities in the buccal surfaces of the upper left and lower right bicuspid and molars, it being only necessary to reverse the position of the handle from that illustrated as between teeth in the upper or lower jaw. Any desired angular adjustment may be

obtained between the compressor and the handle by reason of the threaded association therebetween, the locking mold serving to maintain this adjustment during the interval required for setting the plastic filling. Moreover, to attain a vastly different angular relationship between compressor and handle, the threaded extremity 28 of the compressor 29 may be engaged within the bore 27 adjacent the opposite end of the handle 19, thus providing more convenient access to buccal surfaces of molars farthest removed from the incisors and which may require attention.

The buccal compressor 32 illustrated in Fig. 8 of the drawing includes a concave portion 33 and is intended for use in connection with the filling of cavities in the upper right and lower left bicuspids and molars. The compressor 32 is substantially the reverse of the compressor 29 and includes a goose neck portion 34 terminating in a screw-threaded stem-like shaft 35 identical to the stem-like shaft 28. With the compressor 32 positioned in the angularly offset extremity 25 of the handle 19, the instrument is ready for engagement with the buccal surface of the appropriate upper right bicuspid or molar. Reversal of the position of the handle is required if the tooth being filled is located in the left hand side of the lower jaw. Where the buccal surfaces of molars farthest removed from the incisors require attention, or for different angular adjustments as may be required from time to time, the compressor 32 need only be positioned in the bore 27 adjacent the opposite extremity of the handle 19.

It will be understood that the handle 19 and the buccal compressors 29 and 32 are used in the identical manner described hereabove in connection with the handle 10 and the labial compressor 17. Preferably, the cavity is first prepared and the required angular adjustment of compressor and handle is determined following which the locking mold is completed. Plastic filling material is then inserted into the prepared cavity and the buccal compressor is returned to locking position where it is permitted to remain, with substantially no discomfort to the patient, until the completion of the time interval required for setting the plastic filling.

There has been illustrated in Fig. 6 of the drawing a third form of handle intended for use under conditions where a relatively narrow straight handle is preferable. This handle 36 is preferably polygonal in exterior conformation, to permit of ready grasping, and terminates at the upper extremity thereof in a gently tapered frusto-conical portion 37 provided with an internally screw-threaded axial bore 38 intended for selective engagement with the complementarily screw-threaded extremities of the several compressors, the exterior diameters and screw-threads of all of these extremities being preferably identical. It will be obvious that the handle 36 may be conveniently employed with the labial compressor 17 or with either of the buccal compressors in accordance with required conditions.

It is contemplated that a larger number of compressors, both labial and buccal may be provided to complete the novel dental instrument contemplated herein. These compressors may vary insofar as size, angular inclination and convexity are concerned and will thus be widely adaptable for use upon large or small teeth so as

to accurately conform to the contour thereof as well as to the precise location of the cavity. Further, the instrument lends itself to a wide variety of uses, as will be readily apparent to those skilled in this profession among which are the cementing in position of prepared porcelain or metallic fillings, the taking of impressions in connection with the preparation of the type of filling commonly referred to as an "inlay," and the cementing of such a filling in position. It has been found in practice that the instrument functions with a maximum degree of efficiency and is especially adaptable for use where fillings are required at or immediately adjacent the gum line where, ordinarily, upward pressure that is particularly painful to the patient is necessitated during the time required for the setting of a filling formed from plastic material and, where porcelain or related fillings are being completed, the possibility of cementitious substances adhering to the under surface of the gum is obviated.

It has also been contemplated that handles and compressors may be manufactured integrally and such instruments have functioned highly satisfactorily in accordance with the teachings of the instant application. However, for maximum adjustability as well as versatility to compensate for angular eccentricities found in teeth as a rule rather than as an exception, a conveniently adjustable relationship between compressor and handle, obtained by either frictional or threaded engagement, has been considered preferable.

It will be obvious to those skilled in this art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawing and described in the specification but only as indicated in the appended claim.

What is claimed is:

A dental matrix tool comprising a member having a concave tooth engaging surface, a stem laterally offset and projecting from and secured to said member in a plane inwardly of the filling engaging portion of the concave surface, and a handle for securement to said stem whereby a lateral pressure may be applied to the tooth when said handle is moved in the direction faced by the concave surface, said handle and member being guidable into a fixed position by means of a plastic material surrounding the handle and which is shaped to engage the teeth for fixing the position of the tool during the setting process of the tooth filling material.

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