May 8, 1951 A. BERLINER 2,552,134

DENTAL INSTRUMENT CONSTRUCTION

Filed July 28, 1948

Fig. 2.

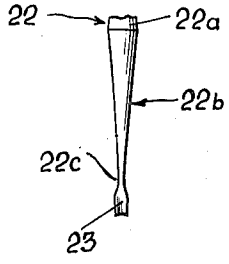


Fig. 3.

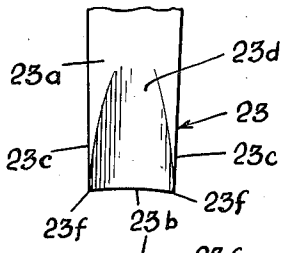


Fig. 4.

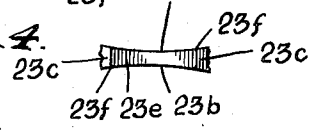
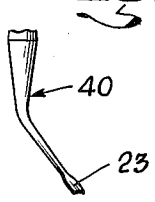


Fig. 1.

Fig. 5.

Fig. 6.



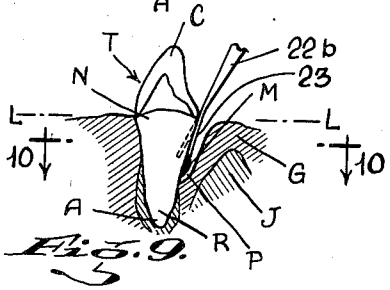


Fig. 9.

Fig. 7.

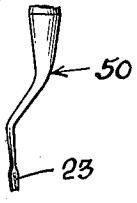
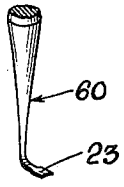


Fig. 8.



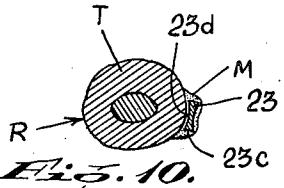


Fig. 10.

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DENTAL INSTRUMENT CONSTRUCTION

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Application July 28, 1948, Serial No. 41,031

1 Claim. (Cl. 32—50)

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This invention relates to dental instrument constructions and more particularly is directed to improvement in scaling or planning instruments for use in periodontal treatments when removing subgingival irritants, deposits and foreign matter and for other like or similar purposes.

Among the objects of the invention is to generally improve dental instruments of the character described which shall be simple in construction, which shall be relatively inexpensive to manufacture, which shall require a minimum of digital skill in manipulation for periodontal and similar dental treatment, which shall provide simplified technic for the general practitioner to render periodontal treatment equal to specialists, which shall avoid accidental lacerations when used in scaling or planing the root and crown surfaces of teeth, which shall be shaped and constructed to permit desired planing and smoothening of the tooth root and crown surfaces to be expeditiously accomplished with great ease and maximum control, which shall preclude scratching, nicking or gouging the root surfaces by virtue of the novel construction, and which shall be efficient and practical to a high degree in use.

Other objects of the invention will in part be obvious and in part hereinafter pointed out. The invention accordingly consists of features of construction, combination of elements, arrangements of parts which will be exemplified in the construction hereinafter described and of which the scope of the application will be indicated in the following claims.

In the accompanying drawing in which is shown one illustrative embodiment of this invention.

Fig. 1 is a fragmentary side elevational view of a jaw region showing a tooth, partially broken away, undergoing periodontal treatment with a dental instrument constructed to embody the invention.

Fig. 2 is a front elevational view of the tool or business end portion of the instrument shown in Fig. 1 formed with a cutting blade extending in substantially straight alignment with the shank thereof.

Figs. 3 and 4 are enlarged fragmentary front elevational and leading end views, respectively, of the cutting blade of the improved dental instrument, shown in Figs. 1 and 2.

Figs. 5, 6, 7 and 8 are side elevational views of tool or business end portions of instruments constructed to embody the invention formed with

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various offset shanks, such for example, as may be required to accommodate and facilitate reaching differently shaped teeth crowns and roots in practicing the invention for periodontal treatment.

Fig. 9 is a fragmentary view of a jaw section like Fig. 1 showing the detail of the blade in an effective position, the resilient flexure of the blade with respect to the shank being shown in dotted lines, and

Fig. 10 is a cross-sectional view of the tooth structure and adhering mass as seen on lines 10—10 on Fig. 9, showing the wedging action of the blade.

It has been found in that branch of the practice of dentistry, known as periodontology, that one of the primary local aggravating factors conducive to periodontal disease is the accumulation of subgingival debris and deposits of foreign matter on and around the necks of the crowns and roots of teeth. Such accumulations manifest their presence by becoming calcified through deposits in mineral which firmly adheres to the tooth structure.

As seen in Figs. 1, 9 and 10 tooth structure T represents one example of typical tooth morphology having an exposed cap top portion or crown C, a neck portion N extending about the tooth T just below the crown C in the region of the gum or gingival line L—L, and a root R of tooth T which extends down from said neck portion N in through the gum or gingiva G terminating at apex A at the lower end of the tooth T. Foreign accumulation in a progressive case of periodontal disease may be found in a pathologic pocket P formed in the subgingival region opposite the jaw alveolar bone J, as a calculus mass M adhering to the tooth root surface R.

As seen from the drawing, 20 denotes a dental instrument constructed to embody the invention for use in removing said calculus mass M or other adhering formations on the neck N or root portion R of the normal tooth structure T thus making conducive the environment for maintaining the health of the adjacent tissues, and in treating and conditioning the surfaces of such tooth portions to bring the environment conducive to return the surrounding tissues into a healthy normal state free from pocket P.

Said instrument 20 may be made in the conventional manner as a single steel structure, or as here shown, may comprise an elongated handle 21 made of any suitable material such as plastic, Monel metal, stainless steel, brass or steel, polished or chrome plated, having an end holder

21*a*, the exterior surface 21*b* of which may be knurled and provided with spaced grooves to serve as a frictional, non-slip finger gripping means. Said holder 21*a* may have suitable means, such as an axial tapered bore 21*c* into which is fitted to firmly and rigidly seat tapered end 22*a* of a tool 22 having business leading end portion 22*b* for said instrument 20.

Said tool end portion 22*b* may be made of a suitable material, such as tempered steel, polished or plated, having a blade 23 terminating in an intermediate shank portion 22*c* which extends from said tapered end 22*a*, said blade 23 serving as an exploring, cutting and planing means for removing said calculus mass M in the manner hereinafter described.

Blade 23 may be made with flattened wide front and rear sides or faces 23*a* that are each hollow ground or otherwise formed with a tapered concaved surface 23*d* of a contour that is readily adapted to conform, as far as practical to the convexities of surfaces of the neck N or root portions R of the teeth T to permit bringing one of two leading cutting and planing edges 23*b* of blade 23 in position for giving maximum effective contact therewith. Fattened narrow or edge side portions 23*c* of the blade 23 between said wide faces 23*a* may be tapered down from said shank portion 22*b* at an angle to provide a prying wedge structure which may serve to break or split off the said mass M and thereby often reducing the requirement of the cutting and planing action by blade edge 23*b* to minimum.

The cutting and planing edge 23*b* may be made to have a convex contour transversely with respect to the length of blade 23, as shown in Fig. 3, so that it provides a shearing action when effectively used. Leading end 23*e* of blade 23 which terminates said tool and portion 22*b* is otherwise flat or slightly concaved so that the two identical spaced apart cutting and planing edges 23*b* are each selectively made available of use, as is clear from Fig. 4. Preferably the four corners 23*f* of blade end 23*e* which terminate spaced cutting edges 23*b* are rounded off or blunted, so that when contacting the tooth surfaces at an angle other than that effective to permit cutting and planing action blade edges 23*e*, said corners 23*f* cannot readily score the root surface or lacerate soft tissues contiguous with the root surface thereby lessening possible bleeding and obscuring the field of treatment. Said rounding off of blade corners 23*f* also eliminates to a great extent possibility of injuring or destroying the radiolucent decalcified osteoid matrix.

The efficiency of the procedure with said instrument 20 is thus assured without depending only on the sense of touch but rather having the added desired advantage of reducing bleeding to a minimum and hence making greater visibility available.

Any scoring or nicking of the tooth root surface R should the corners 23*f* of blade 23 be left sharp creates new rough or jagged areas which provide niduses for the redeposition of additional foreign matter.

The shank portion 22*c* from which blade 23 extends is so constructed and arranged to be relatively, thin, narrow and of a length to give a controlled flexibility to a measured degree of pressure, namely, for a finger pressure of about three ounces on handle surface 21*b*, the blade 23 will be flexed approximately 5° to 7° from its normal set position as indicated in dotted lines

in Fig. 9. Said pressure transmitted to blade 23 provides a resilient flexure of said tool end portion 22*b*, permitting blade 23 to override convexity, concavity or other vertical and horizontal dilacerations of the tooth root surfaces R without destroying its normal integrity thereof, thus manipulation of the instrument 20 takes place through said feel control as well as with maximum visibility requiring a minimized digital skill with less insipient potential damage to the tooth structure being treated.

In Figs. 5, 6, 7 and 8 are shown various forms of tools 30, 40, 50 and 60 each adapted to be securely fitted into holder 21*a* of handle 21, each tool being provided with a blade 23 constructed as above described. These tools which are selectively used represent examples of those forming a set of so called straight, hoe and offset types, at least about eight of such tools being considered as a set for use on various tooth surfaces usually submitted to periodontal treatments.

In practising the invention, with a set of instruments 20 constructed as described above, let it be assumed that tooth T shown in Figs. 1 and 9 is to be given periodontal treatments, said tooth T having a slight gingival recession forming pocket P due to a subgingival irritant, such as calculus mass M in said pocket P. The blade 23 on a straight type tool 22 mounted in holder 21, as shown in Fig. 1, is inserted in the pocket P with the concave surface 23*d* conformed to the convexed surface tooth root R. Finger pressure exerted on holder 21 is transmitted as a resilient flexure means to blade 23 against said tooth root surface R and on planing movement the blade 23 will cut into the mass M with the tapered wedge of said blade 23 often splitting the mass M into fragments which can be removed thereby reducing the otherwise required scaling and curetting operations.

The mass M may be completely removed by planing with instrument 20 to leave the root tooth surface clean and smooth thereby aiding in eliminating the pocket P conducive to return the surrounding tissues to a healthy condition.

The specific shape and contour of the surfaces of blade 23 as has been described above provide means to accomplish the results sought expeditiously and with maximum control requiring a minimum of digital skill while eliminating unnecessary bleeding and destruction of the underlying soft and hard supporting tissues, as is clear from Fig. 9.

Each of the blade edges 23*b* shaped as described above provide highly effective shearing and planing means yet eliminate to a great extent undesirable injury to the surrounding tissue or nicking of the root surface because of the rounding of corners 23*f*.

It is thus seen, therefore, that there is provided an improved dental instrument in which the objects of the invention are achieved and which is well adapted to meet all conditions of technical and practical use.

As various possible embodiments may be made in the above invention for use for different purposes and as various changes might be made in the embodiments and method above set forth, it is understood that all the above matters here set forth or shown in the accompanying drawing are to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

In a dental instrument construction having a

flexible shank portion carrying a blade comprising flattened wide front and rear faces, a leading end terminating said wide faces, concaved surfaces formed in each of said wide faces tapered toward said leading end, each of said surfaces being of curved cross sectional shape to selectively accommodate convexed surfaces of neck and root portions of teeth, flattened narrow side portions extending between said wide faces tapered from said shank portion to said leading end to provide with said wide faces spaced apart planing edges each serving to remove adhering formations on said neck and root portions, said flattened tapered faces forming a wedge structure for splitting off subgingival irritants from said tooth neck and root portions, each of said planing edges formed between said concaved surfaces at the leading end having a concave contour of a curvature of at least that of the exterior of said neck and root portions positioned to extend transversely with respect to the length of the blade, and rounded off corners provided at the

junction of said flattened wide faces with the leading end to terminate said edges for preventing accidental gum laceration.

ABRAHAM BERLINER.

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