Oct. 2, 1951 A. BERLINER 2,569,844

DENTAL INSTRUMENT CONSTRUCTION

Filed July 28, 1948

Fig. 3.

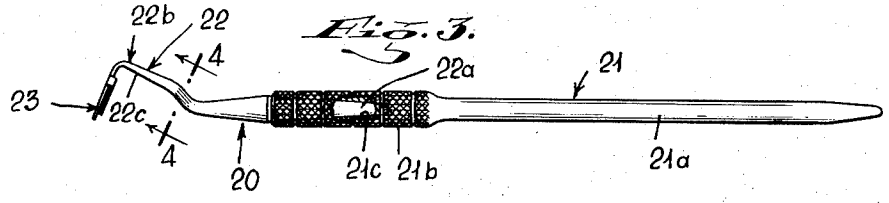


Fig. 4.

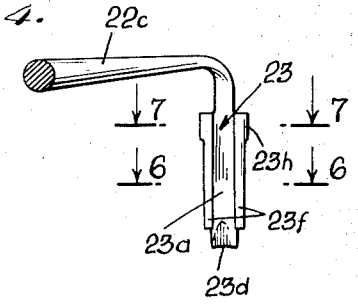


Fig. 5.

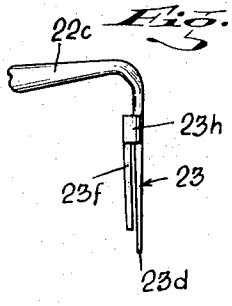


Fig. 1.

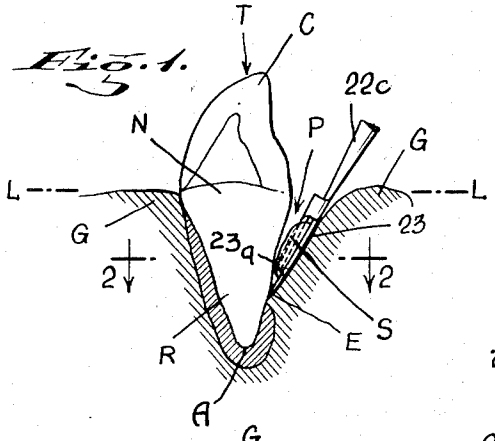


Fig. 6.

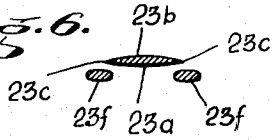


Fig. 7.

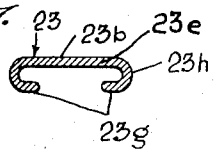


Fig. 2.

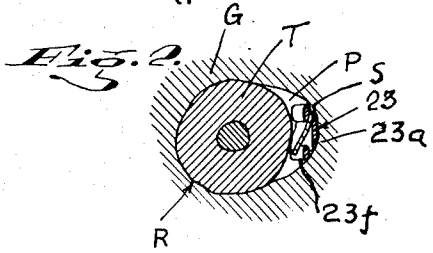
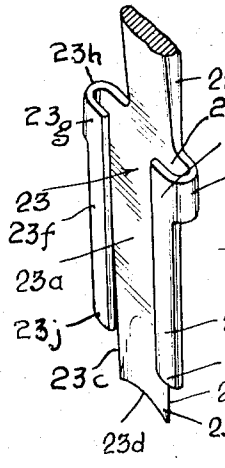


Fig. 8.



INVENTOR
ABRAHAM BERLINER
BY
Louis Barnett
ATTORNEY

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DENTAL INSTRUMENT CONSTRUCTION

Abraham Berliner, Brooklyn, N. Y., assignor to Gollobin Dental Co., Inc., New York, N. Y., a corporation of New York

Application July 28, 1948, Serial No. 41,032

6 Claims. (Cl. 32—46)

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This invention relates to dental instrument constructions, and more particularly is directed to self limiting epithelial scalpels for use in cutting or slicing definite thickness of gum tissue and removing epithelial attachment in periodontal surgical treatments.

Among the objects of the invention is to improve dental instrument constructions of the character described which shall be simple in construction, which shall be relatively inexpensive to manufacture, which shall not require extraordinary digital skill or adequate instrumentation, which shall provide improved means for the general practitioner to give said surgical periodontal treatment equal to specialists, which shall eliminate lacerations and shredding of the soft gum tissues of the region under treatment, which shall be shaped and constructed to preclude possible complete incision of the soft wall of a pocket under treatment which shall be self limiting in cutting or slicing predetermined thickness of tissue and permit removal of epithelial attachment at the apical area of a pocket expeditiously with great ease and under maximum control to provide an environment most conducive to functional repair, 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, combinations 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 possible illustrative embodiment of this invention.

Fig. 1 is a fragmentary side elevational view of a gum region showing a tooth, undergoing periodontal treatment with a portion of a scalpel constructed to embody the invention in effective position for slicing a predetermined thickness of the gum tissue of a pocket.

Fig. 2 is a cross section view taken on lines 2—2 in Fig. 1.

Fig. 3 is a side elevational view of a complete instrument constructed to embody the invention, portions of which are shown in Figs. 1 and 2.

Fig. 4 is an enlarged sectional view as seen from line 4—4 in Fig. 3, showing a front side of the cutting blade and guards therefor.

Fig. 5 is an enlarged fragmentary side view of the blade and guards of the instrument shown in Fig. 4.

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Figs. 6 and 7 are detailed cross sectional views taken on lines 6—6 and 7—7, respectively, in Fig. 4, and

Fig. 8 is an enlarged perspective view showing in detail the blade and guard end of the improved instrument shown in Figs. 4, 5, 6 and 7.

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 neck of the crown and roots of teeth. Such accumulation manifests its presence by degeneration of the normal epithelial tissue and the formation of a pathological periodontal pocket which generally require surgical treatment.

As seen in Figs. 1 and 2 tooth structure T represents one example of a typical tooth formation shown undergoing periodontal treatment, 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 to terminate in apex A at the lower end of the tooth T. In an aggravated case there may be found a pathological periodontal pocket P formed in the subgingival region along the tooth root surface R.

As seen from the drawing, 20 denotes a dental instrument constructed to embody the invention for use in removing by cutting a definite thickness of degenerated epithelial tissue found lining said pocket P and removing the epithelial attachment at the apical area of pocket P to provide an environment most conducive to functional repair and return the surrounding tissues into a healthy normal state free from pockets P.

Said instrument or scalpel 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 grooves to serve as a frictional, nonslip finger gripping means. Said holder 21*a* may have an axial tapered bore 21*c* into which is fitted to conform and firmly seat tapered end 22*a* of a tool 22 having a business 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 knife blade 23 ter-

minating an intermediate shank portion **22***c* which extends from said tapered end **22***a*, said blade **23** serving as a slicing, cutting and piercing means for readily removing a predetermined thickness of sliced tissue S from soft walls of pockets P and removal of the epithelial attachment of the apical area E of pocket P in the manner hereinafter described.

Knife blade **23** may be of the double edge type made with elongated substantial flat or relatively slightly convex front and convex rear sides, **23***a* and **23***b*, respectively, that is, having peripheral cutting edges **23***c* formed with a concaved or arcuate shaped leading or tip end **23***d*. Said blade **23** may be formed to have a slight taper from shank portion **22***c* longitudinally in the direction of the tip end edge **23***d*. The latter may be made by grinding a shallow concaved section **23***k* on front side **23***a* so that the cutting edge at the leading end **23***d* may be made extremely sharp, as shown in Figs. 4 and 5.

Shank portion **22***c* from which blade **23** extends, may be so constructed and arranged to give a degree of rigidity for transferring the finger pressure exerted on handle surface **21***b*, to the blade **23**. Said finger pressure transmitted to the blade **23** thus permits the blade **23** to be depressed into the tissue forming soft wall S of pocket P for initiating the cutting and slicing thereof, so that, manipulation of instrument **20** can take place through feeling and requires a minimum digital skill.

For predetermining and controlling, that is, self-limiting tissue of said soft wall S to be removed, inner portion **23***e* of blade **23**, adjoining shank portion **22***c*, may have suitable means, such for example a pair of spaced apart gaging guards **23***f* integrally formed therewith. Said guards **23***f* each may be elongated and have an end **23***g* interconnected through an offset **23***h*, to extend from said blade inner portion **23***e* and having a blunt free end **23***j* terminating short of blade leading end **23***d*.

Said guard means **23***f*, as seen from Figs. 4 and 5, lie in a plane substantially parallel to and spaced from longitudinal axis of blade **23**, facing said front side **23***a*, said guards **23***f*, being a thin flattened structure formed with smoothly rounded edges and positioned to extend above the spaced knife cutting edges **23***c* a distance corresponding to the desired thickness of the slice of tissue wall S to be removed. The width of each guard **23***f* when formed in a pair may be sufficiently extended laterally outward and inward with respect to the length of knife edges **23***c* to shield the latter, and are thus shaped and positioned with respect to the blade cutting edges **23***c* that only a definite thickness of degenerated epithelial tissue forming lining of the pathological periodontal pocket P can be removed during instrumentation and precluding the possibility of complete incision of the soft wall of pocket P through its entire thickness and otherwise eliminating laceration and shredding of soft tissue, as is clear from Figs. 1 and 2.

Blade leading end **23***e* shaped with concaved section **23***k* on the front side **23***a* conforms with the curvature of the root surface R of tooth T, and has a keen sharp edge for piercing or severing and removing the epithelial attachment at the apical area E thereby leaving a fresh corium that yields a clean blood clot, the organization of which is mandatory for repair of pocket P under treatment.

Instrument **20** may be made with offset shank portion **22***c* shaped to accommodate and facilitate reaching pockets P that may be present about differently shaped teeth crowns and roots that are being given periodontal treatments. Two instruments **20** with different offset shank portions **22** will generally be found sufficient for use on usual treatments of this kind.

In practicing the invention, with a suitably offset instrument **20** constructed as described above, let it be assumed that tooth T, shown in Figs. 1 and 2, is to be given periodontal treatment, said tooth T having a slight gingival recession forming pocket P. If a calculus mass is present and adheres to the tooth root R such mass is first removed by planing to leave the tooth root surface R clean and smooth, using instruments in the manner described in my copending application Ser. No. 41,031, now Patent No. 2,552,134 granted May 8, 1951, filed herewith.

Instrument **20** is then inserted into pocket P until the leading end **23***d* bears against and cuts the epithelial area E in the apical of pocket P. By pressing the convex side **23***b* of the blade **23** against the degenerated epithelial tissue found lining the pathological periodontal pocket P and manipulating the instrument **20** laterally, a self-limiting slice S can be cut away by blade edges **23***c* and removed without otherwise lacerating or shredding the remaining soft tissue, and preclude all possibility of complete incision of the soft wall of the pocket through its entire thickness. The cutting and removing of the epithelial attachment in the apical area and the degenerated epithelial tissue leaves a fresh corium and yields a clean blood clot which adheres to the scaled and planed root surface R thereby providing an environment most conducive to functional repair of the treated pocket P.

It has been found in practice that for general use blade **23** may be from 9 to 10 mm. in length and the self-limiting of the thickness of epithelial tissue removed should be that which passes between the guard means **23***f*, the blade **23** when spaced from 0.5 to 0.7 mm., therefrom, and the guard means **23***f* extending from 1.0 to 1.5 mm. short of the extreme end **23***d* of the blade **23**.

The guard means **23***f* when provided as a spaced pair of members described above instead of being a single structure permits ready cleaning and gives an unobstructed view of the operating field.

It is thus seen, therefore, that there is provided an improved dental instrument in which the objects of the invention are achieved and which are 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 embodiment set forth, it is understood that all the above matters here set forth are shown in the accompanying drawing are to be interrupted as illustrative and not in a limiting sense.

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

1. A dental instrument having a handle, an elongated relatively flat blade extending from said handle formed with a cutting edge along the entire periphery thereof including a leading end, and spaced apart guard members integrally formed with a portion of said blade adjacent the handle, said guard members being offset in parallel alignment with respect to oppositely positioned cutting edge portions of said blade and terminating in free ends short of said blade leading end, said guard members each be-

ing uniformly spaced from the adjacent portion of the cutting edge to provide self-limiting means for predetermining thickness of slices of tissue to be cut on effective manipulation of the instrument, said blade having a convex surface on a side thereof opposite said guard members.

2. A dental instrument having a handle, an elongated relatively flat blade extending from said handle formed with a cutting edge along the entire periphery thereof including a leading end, and spaced apart guard members integrally formed with a portion of said blade adjacent the handle, said guard members being offset in parallel alignment with respect to oppositely positioned cutting edge portions of said blade and terminating in free ends short of said blade leading end, said guard members each being uniformly spaced from the adjacent portion of the cutting edge to provide self-limiting means for predetermining thickness of slices of tissue to be cut on effective manipulation of the instrument, said blade having a convex surface on a side thereof opposite said guard members and a concaved section at the leading end beyond said guard members.

3. A dental scalpel blade having spaced cutting edges joined for continuation along the periphery of the blade by an intermediate leading end cutting edge, and guard means projecting from the blade at the portion thereof terminating said cutting edges, said guard means extending in spaced relation from said cutting edges and having a free end reaching short of said leading end cutting edges for controlling the thickness of tissues to be sliced on effective manipulation of the blade, said blade having a convex side opposite that facing said guard means.

4. A dental scalpel blade having spaced cutting edges joined for continuation along the periphery of the blade by an intermediate leading end cutting edge, and guard means projecting from the blade at the portion thereof terminating said cutting edges, said guard means extending in spaced relation from said cutting edges and having a free end reaching short of said leading end cutting edges for controlling the thickness of tissues to be sliced on effective manipulation of the blade, said blade leading end having a concaved region beyond the guard means and a convex side opposite that facing said guard means, said blade being tapered in thickness in a direction toward said leading end cutting edge.

5. A dental scalpel blade having spaced cutting edges joined for continuation along the periphery of the blade by an intermediate leading end cutting edge, and guard means projecting from the blade at the portion thereof terminating said cutting edges, said guard means extending in spaced relation from said cutting edges and having a free end reaching short of said leading end cutting edges for controlling the thickness of tissues to be sliced on effective manipulation of the blade, said blade having a convex side opposite that facing said guard means, and being tapered in thickness in a direction toward said leading end cutting edge, the latter having an arcuate shaped contour.

6. A dental scalpel blade having spaced cutting edges joined for continuation along the periphery of the blade by an intermediate leading end cutting edge, and guard means projecting from the blade at the portion thereof terminating said cutting edges, said guard means extending in spaced relation from said cutting edges and having a free end reaching short of said leading end cutting edges for controlling the thickness of tissues to be sliced on effective manipulation of the blade, said blade having a convex side opposite that facing said guard means, said guard means being integrally formed with the blade and offset as parallelly spaced apart portions with each of said portions extending laterally beyond said spaced cutting edges to shield the latter, the leading end cutting edge being made with an arcuate shaped contour.

ABRAHAM BERLINER.

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