Dec. 12, 1939. G. P. BRENNER 2,183,512

FITTING ARTIFICIAL DENTURES

Filed Nov. 12, 1936

FIG. 1

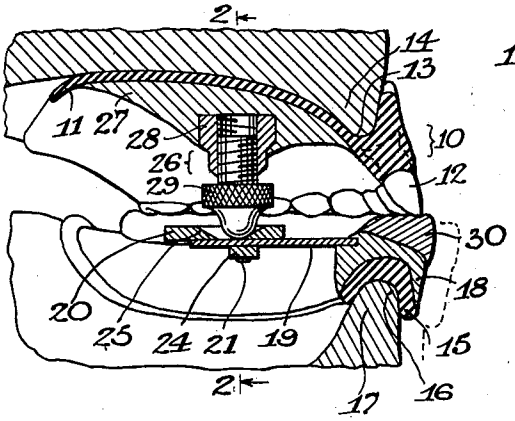


FIG. 2

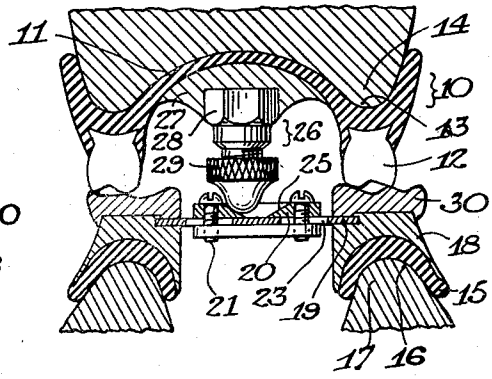


FIG. 3

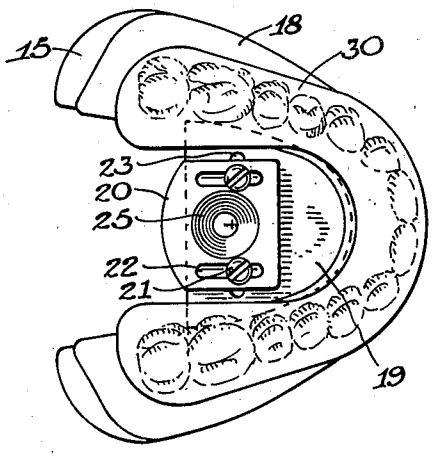


FIG. 5

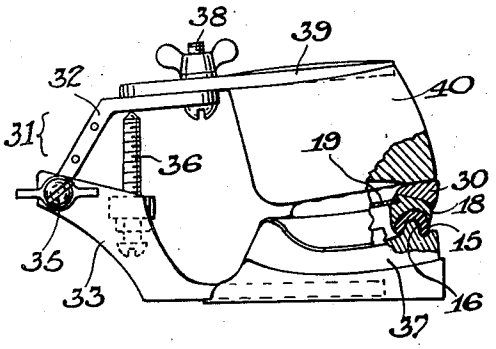


FIG. 6

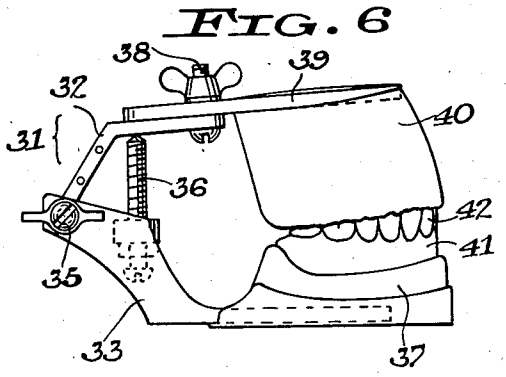


FIG. 7

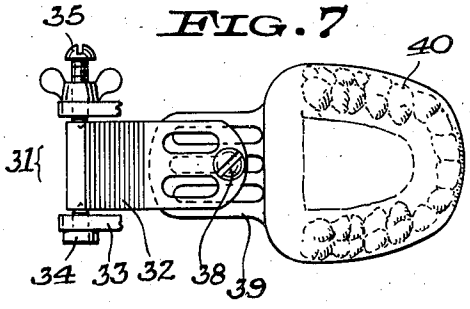
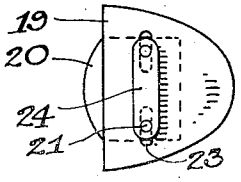


FIG. 4



INVENTOR

George P. Brenner

By R. H. Caldwell

ATTORNEY

WITNESSES

L. E. Milam

C. L. Neal

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FITTING ARTIFICIAL DENTURES

George P. Brenner, Milwaukee, Wis.

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7 Claims. (Cl. 32—19)

The invention relates to the fitting of artificial dentures.

In the fitting of artificial dentures it is necessary to grind the occlusal surfaces of the teeth of at least one of the cooperating dentures to avoid interference and to permit satisfactory mastication.

An object of the invention is to provide an improved apparatus for fitting dentures, whereby to facilitate accurate and expeditious grinding-in of the occlusion.

Another object of the invention is to provide a simple but effective device for guiding the mandibular movements of a patient in such manner that a functional bite of desired characteristics can be obtained.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawing, illustrating an embodiment of the invention and its application,

Fig. 1 is an anterior-posterior sectional elevation of an upper denture and lower bite rim, as applied to a patient's mouth, the lower jaw being in a position corresponding to centric occlusion, and a protrusive position being indicated by dotted lines;

Fig. 2 is a transverse sectional elevation thereof taken generally on the line 2—2 of Fig. 1, but showing the lower jaw in a laterally displaced position;

Fig. 3 is a top view of the bite rim after receiving an impression;

Fig. 4 is a bottom view of a guide device forming part of the bite rim;

Fig. 5 is a side elevation of an articulator having thereon the bite rim and a cast made therefrom, parts being broken away and parts being shown in section;

Fig. 6 is a side elevation of the articulator having thereon the cast and a lower denture to be checked by the cast, and

Fig. 7 is a bottom view of the upper portion of the articulator, parts being broken away to show the bottom face of the cast.

In accordance with the invention, there is established or recorded in impressionable material the functional cusp paths or loci of the teeth of one of the dentures as the various mandibular movements are executed by the patient. From the impression thus produced a cast is made, and the second denture is then ground in with the guidance of the cast, assuring proper occlusion of the cooperating dentures when subsequently used by the patient.

One of the dentures, preferably the upper denture **10**, is processed in the usual manner, and the lower waxed denture (not shown) is also made. The upper denture **10** comprises a palatal plate **11** of any suitable material, such as hard rubber, carrying a set of teeth **12** which may have either anatomical or mechanical forms, as desired. The plate has the usual channel **13** to seat on the maxillary arch ridge **14**.

A bite rim or plate **15** of hard rubber or other suitable material is prepared in the usual manner for the lower jaw and has a channel **16** to seat on the arch ridge **17**. The bite rim **15** carries thereon a U-shaped platform or saddle **18** of hard wax or compound in which are embedded the edges of a flat metal guide plate or bearing plate **19** of substantially semi-elliptical form, the metal plate being substantially parallel to the top surface of the compound **18** and, to the occlusal plane. A cam plate **20** is mounted on the upper face of the guide plate **19** and is adjustably secured thereto by a pair of screws **21** which pass through parallel slots **22** in the cam plate and aligned transverse slots **23** in the guide plate and are threaded into a clamping bar **24** engaging the lower face of the guide plate, the slots **22** and **23** being at right angles to each other. The cam plate **20** has a central frustro-conical opening **25**, the axis of which is perpendicular to the occlusal plane, and the slope of the side walls of which substantially corresponds to the cusp angle of the teeth **12** in the upper denture. The cusp angle commonly ranges from 20° to 30°. The frustro-conical opening **25** widens upwardly and forms a frustro-conical or saucer-shaped cavity or recess with the top face of the guide plate **19**.

An adjustable center bearing jack or contact member **26** is firmly but removably secured to the bottom face of the upper plate **11** by a suitable compound **27**, and comprises an internally screw-threaded polygonal sleeve **28** embedded in the compound and a round-headed thumb-screw **29** adjustably threaded in the sleeve. The rounded head of the thumb-screw bears in the frustro-conical or saucer-shaped recess formed by the cam plate opening **25** and top surface of the guide plate **19**. The axis of the jack **26** is perpendicular to the occlusal plane and is located in the median plane of the denture and substantially at the center pressure of the denture. The cam plate **20** is so located that when the lower jaw is in its normal or Gothic arch rest position the rounded head of the screw **29** bears on guide plate **19** at the anterior part of the circular

opening in the cam plate 20. This bearing point is indicated by the cross in Fig. 3.

A U-shaped pad of impression wax is secured to the hard wax platform 18 and is of sufficient thickness to obtain uniform contact with the teeth of the upper denture to within about $\frac{1}{32}$'' of complete closing. This may be determined on a plain line articulator 31 commonly used in the processing of dentures. Figs. 5 and 6 show this articulator at later stages of use.

The upper denture with the bearing jack is seated on the upper jaw of the patient, and the bite plate with the pad of impression wax 30 is seated on the lower jaw. The patient is then directed to execute the various masticating movements of the lower jaw, first the protrusive movement and then the lateral movements. In executing these movements the bearing jack rides for a limited distance on the flat top face of the guide plate 19 and in longer excursions rides on the sloping surfaces of the frustro-conical opening 25, causing a slight depression of the lower jaw to compensate for the cusp angles of the teeth. To check the contact of the bearing jack with the surfaces of the frustro-conical or saucer-shaped recess, the latter may have a thin lubricated coating of carding wax (not shown) which is cut through by the jack as the mandibular movements are executed. If there should be a rock, it is preferable to add more wax to the pad 30 and repeat the mandibular movements under lighter pressure until the rock is removed. The functional paths or loci of the cusps and incisal edges of the upper teeth are now established or recorded in the impression wax 30, which has been pressed and carved by the teeth.

The plain line articulator 31 is here shown to comprise upper and lower members 32 and 33, respectively, detachably hinged together by aligned trunnions 34 and 35, the latter being in the form of a screw. The approach of the upper and lower members is limited by an adjustable stop screw 36 carried on the lower member 33. The lower member 33 carries a cast 37 for processing the lower denture and bite rim, and the upper member has a clamp screw 38 for an extension member (not shown) carrying the usual cast (not shown) employed in processing the upper denture. This extension member is removed and replaced by a similar member 39 shown in Figs. 5 to 7. Alternatively, the entire upper member may be replaced. The lower bite rim 15 with the functional wax tracings is now replaced on the lower cast 37 of the articulator, and a cast 40 is flowed into the wax and luted to the extension member 39. When the cast 40 is hard it is coated with a suitable glazing varnish. The lower bite rim 15 is now removed from the articulator and is replaced by the lower waxed denture (not shown) to check the occlusion. The waxed denture is then removed and processed to form the finished lower denture 41 seen in Fig. 6, this denture having teeth 42. The lower denture 41 is sealed back on the articulator and the occlusion is ground in to conform to the functional occlusal paths on the cast 40. The initial grinding may be assisted by the use of carbon paper (not shown) interposed between the cast and the lower denture to locate the areas requiring grinding. When the occlusion is completely ground in, the lower denture 41 is removed from the articulator and polished. The bearing jack 26 is removed from the upper denture and the two dentures are then ready for use.

The occlusion formed in this way follows the mandibular movements, and has a horizontal clearance of about $\frac{1}{32}$'' in all directions and the so-called rocking chair fit. The free horizontal movement, which permits rotary mastication or grinding, is entirely in protrusion and not in retrusion, thus compensating for the settling of the tissue and consequent shortening of the vertical dimension to within a permissible degree.

By means of the invention, the patient's own mandibular movements are utilized for recording the functional cusp paths or loci in the wax, thereby affording a high degree of accuracy, and dispensing with the use of an anatomical articulator.

While it is preferable to use the upper denture for carving or tracing the cusp paths in the wax, it is obviously possible to invert the process, using the lower denture as the carving or tracing medium. The invention is also applicable to cases where one of the dentures consists of natural teeth. The bearing screw 29 and the guide device on which it bears are preferably carried on a denture and opposed bite rim, respectively, as shown, but it will be obvious that this relation may be reversed.

What I claim as new and desire to secure by Letters Patent is:

1. Apparatus for use in fitting cooperating dentures, comprising, in combination with one of the dentures, of a bearing member adapted to be detachably secured to said denture between the lateral teeth thereof, a bite rim adapted to be seated on the arch ridge of a patient opposite said denture, a guide device secured to said bite rim between the opposite sides of said rim and having a recess with sloping walls to be engaged by said bearing member for guiding the mandibular movements of the patient, the slope of said walls being substantially equal to the cusp angle of the teeth of the denture, and a pad of impression material secured to said bite rim and adapted to be carved by the teeth of the denture during the mandibular movements to record the functional cusp paths of the teeth.

2. Apparatus for use in fitting cooperating dentures, comprising, in combination with one of the dentures, of a bearing member adapted to be detachably secured to said denture between the lateral teeth thereof, a bite rim adapted to be seated on the arch ridge of a patient opposite said denture, a guide device secured to said bite rim between the opposite sides of said rim and having a substantially frustro-conical recess with sloping side walls and a flat bottom wall, the slope of said side walls being substantially equal to the cusp angle of the teeth of the denture, and said bottom wall being substantialy parallel to the occlusal plane, said bearing member adapted to be in engagement with the anterior part of said bottom wall when the mandible is in the position of centric occlusion, and a pad of impression material secured to said bite rim and adapted to be carved by the teeth of the denture during the mandibular movements to record the functional cusp paths of the teeth.

3. In combination, with a denture, of mandible-guiding means including a bite rim having a guide device thereon with a substantially frustro-conical mandible-guiding recess widening outwardly, the axis of said recess being substantially perpendicular to the occlusal surface of the bite rim and between the opposite sides of the rim, and the slope of the walls of said recess being substantially equal to the cusp angle of the teeth

of the denture, and a pad of impression material carried on said bite rim and adapted to be carved by the teeth of said denture in the mouth of a patient during the execution of mandibular movements by the patient to record the functional cusp paths of the teeth.

4. A bite rim for fitting dentures, having a plate secured thereon in substantially parallel relation to the occlusal surface of the bite rim, a member adjustably secured to said plate and having a substantially frustro-conical opening the axis of which is substantially perpendicular to the plate, said opening forming a substantially frustro-conical mandible-guiding recess with said plate, and a pad of impression material carried on said bite rim and adapted to be carved by the teeth of a cooperating denture in the mouth of a patient during the execution of mandibular movements by the patient to record the functional cusp paths of the teeth.

5. A mandible-guiding device for denture-fitting bite rims, comprising a plate adapted to be secured to a bite rim substantially parallel to the occlusal surface of the bite rim and between the opposite sides of said bite rim, and a member slidable on and adjustably secured to said plate at the occlusal side thereof and having a substantially frustro-conical opening the axis of which is substantially perpendicular to the plate and forming a frustro-conical mandible-guiding recess with the plate.

6. Apparatus for use in fitting cooperating upper and lower dentures, comprising, in combination with the upper denture, of a bearing member adapted to be detachably secured to the upper denture substantially centrally between the opposite sides of said denture, a bite rim adapted to be seated on a patient's mandibular arch ridge opposite said upper denture, a guide device secured to said bite rim between the opposite sides of said rim and having a recess with sloping walls to be engaged by said bearing member for guiding the mandibular movements of the patient, the slope of said walls being substantially equal to the cusp angle of the teeth of the denture, and a pad of impression material secured to said bite rim and adapted to be carved by the teeth of the upper denture during the mandibular movements to record the functional cusp paths of said teeth.

7. Mandible-guiding means for use in the fitting of dentures to a patient, comprising, in combination with a bearing member adapted to be mounted on one jaw of the patient and having a bearing portion substantially at the center of biting pressure, of a guide device adapted to be mounted on the other jaw of the patient and having a saucer-shaped recess in which said bearing portion is adapted to ride for causing lowering of the mandible in its excursions from a position of centric occlusion.

GEORGE P. BRENNER.