July 16, 1946. J. C. TIGHE 2,404,327

ARTIFICIAL TOOTH

Filed March 23, 1943 2 Sheets-Sheet 1

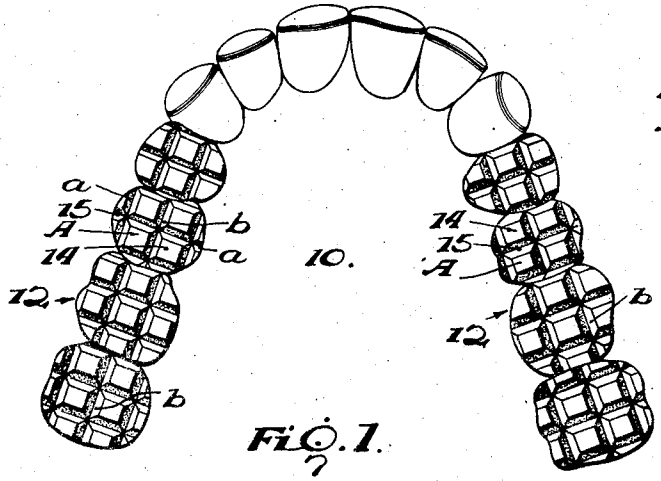


FIG. 1.

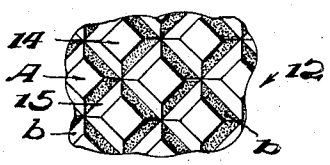


FIG. 4.

FIG. 2.

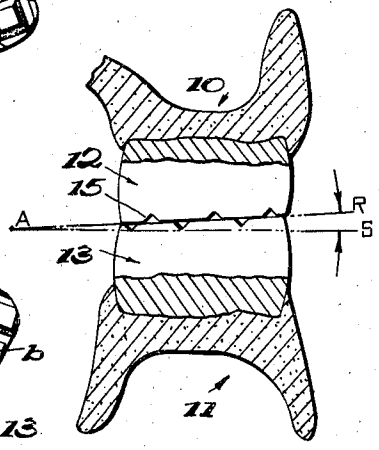


FIG. 5.

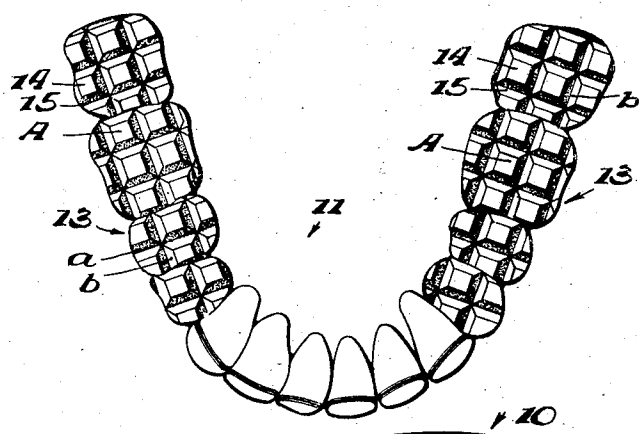
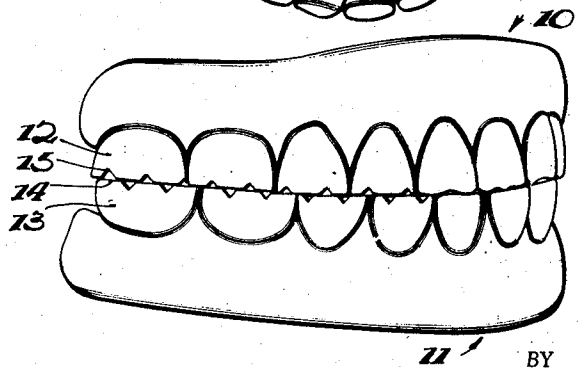


FIG. 3.



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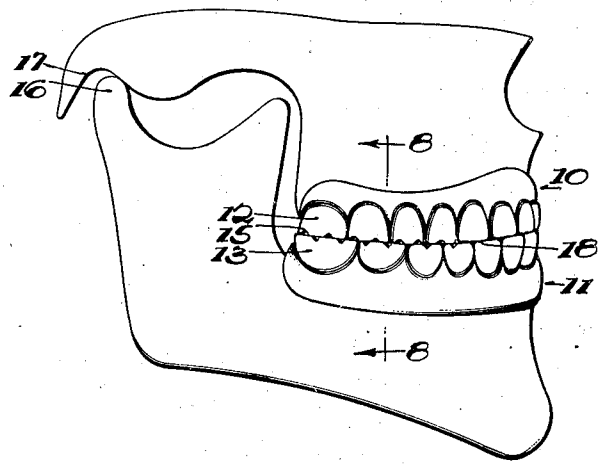


FIG. 6.

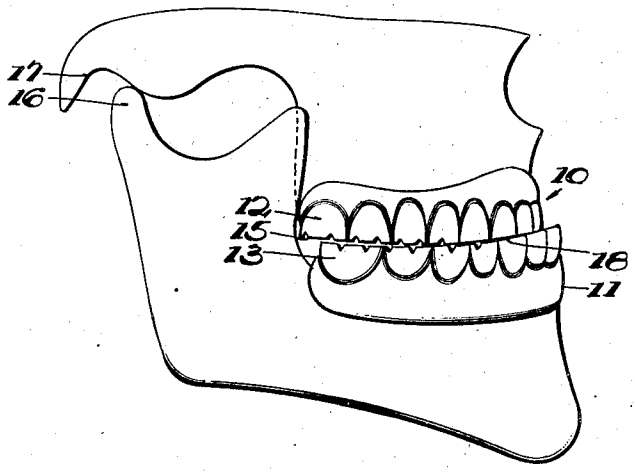


FIG. 7.

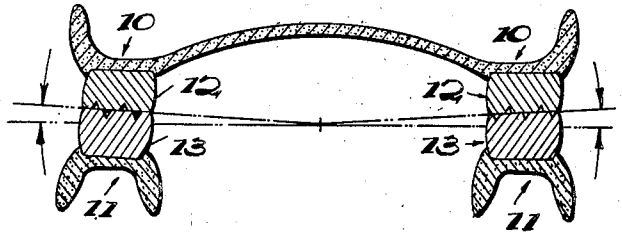


FIG. 8.

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2,404,327

ARTIFICIAL TOOTH

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Application March 23, 1943, Serial No. 480,202

5 Claims. (Cl. 32—8)

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This invention relates to artificial posterior teeth.

One object of the present invention resides in the provision of an artificial posterior tooth composed of porcelain or plastics and more particularly to the occlusal surface of artificial teeth (bicuspids and molars).

Another object of the invention is to provide an artificial posterior tooth with a serrated occlusal surface of a serrated formation to provide a plurality of interconnected or communicating grooves with intermediate flat elevated surfaces and in which the outermost grooves of the tooth lead laterally outwardly of all of the sides of the tooth.

Another object of the invention is to provide a particular design of artificial posterior tooth chiefly for the construction of upper and lower dentures but the use of an independent tooth may be used to advantage in certain types of dentures incident to the fact that the teeth of the dentures are of an independent character with relation to one another.

Another object of the invention resides in the provision of upper and lower dentures provided with artificial posterior teeth having their occlusal surfaces each serrated to provide each occlusal tooth with a plurality of flat surfaces and a plurality of communicating grooves with the outermost grooves leading laterally of the sides of the grooves whereby to provide for effective mastication and escape of foods from between opposing teeth regardless of the direction of the opposing pressure incident to mastication and from the beginning to the end of the masticating stroke.

With these and other objects in view, the invention consists in the novel construction, combination and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction, within the scope of the appended claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:

Figure 1 is an inverted plan view illustrating the general arrangement and usual number of posterior teeth in an upper denture, showing particularly the occlusal surfaces of the upper posterior teeth;

Figure 2 is a top plan view illustrating the general arrangement and the usual number of posterior teeth in a lower denture, showing particularly the occlusal surfaces of the lower posterior teeth;

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Figure 3 illustrates the buccal and labial (cheek and lip side) surfaces of an upper and lower denture in normal occlusion, that is, centric position, in which position each chewing stroke is finished and also as when swallowing and when the teeth are closed in a position of rest;

Figure 4 is an enlarged fragmentary view illustrating a portion of the occlusal surface of a posterior tooth formed in accordance with one embodiment of my invention;

Figure 5 is a transverse sectional view on an enlarged scale through the upper and lower dentures showing the posterior teeth in occlusion;

Figure 6 illustrates the upper and lower jaws together with a side view of an upper and lower denture in "centric position," which is the relative position of the lower to the upper jaw while swallowing or the relation of the teeth and jaws when they are closed in a position of rest, the head of the condyle 16 being at rest in the glenoid 17;

Figure 7 is an elevation illustrating the general view of the upper and lower jaws together with the side view of an upper and lower denture in the protruded position;

Figure 8 is a transverse sectional view illustrating movements of the movable lower denture with relation to the upper denture.

Referring now more particularly to the accompanying drawings, the reference characters 10 and 11 indicate upper and lower dentures, respectively, of a set of false teeth, Figures 1 and 2 in particular illustrating the usual number of porcelain or other posterior teeth 12 in the upper denture and illustrating the usual number of porcelain or other posterior teeth 13 in the lower denture and illustrating also the cuspless occlusal surfaces A of all of the posterior teeth as formed, generally speaking, in accordance with at least one embodiment of my invention.

The occlusal surfaces A of all of the posterior teeth formed in accordance with the present invention are serrated or grooved in a peculiar manner for an effective mastication of food, including elevated flat surfaces 14 and relatively narrow outwardly tapering grooves 15, that is grooves which are substantially V-shaped in cross section.

The grooves 15 of the posterior teeth are formed and arranged to provide for the escape of food in at least four different directions irrespective of the direction of pressure of mastication. In other words, the outermost grooves *a* of the occlusal surface of each posterior tooth leads outwardly laterally from the respective

tooth, providing for escapage of food from therebetween and opposing or adjacent teeth and to which outermost grooves all interior grooves *b* lead, as clearly shown particularly in Figures 1 and 2.

As shown, the flat surfaces **14** are square and the upwardly tapering grooves are straight, all grooves intercommunicating but it will be understood that the flat surfaces **14** may be other than square and the grooves **15** other than straight so long as the grooves communicate with one another for escapage of food from between opposing teeth through outermost grooves opening outwardly laterally of the sides of the teeth. The grooves may range from front to back mesio-distally or from side to side bucco-lingually or diagonally. The grooves may range over part or the entire distance across the occlusal surface. The grooves may be curved instead of being straight, as shown and they may be different lengths, widths, depths and arranged at different angles. Where the grooves range from front to back mesio-distally, and from side to side-bucco-lingually, the flat surfaces **14** have a tendency to take square formation. Where the grooves range diagonally across the occlusal surface, the flat surfaces have a tendency to take a diamond shape. Since the teeth are entirely independent of each other, either type of occlusal surface is equally effective and either or both types may be used in the same or opposing dentures. These teeth are entirely cuspless and are completely independent and the teeth occlude with any portion of opposing teeth.

The said flat surfaces and grooves serve to crush and tear the food from the beginning to the end of the masticating stroke. Since the occlusal planes of the opposing teeth are milled to fit each other, the same degree of masticating efficiency is obtained regardless of the direction of the opposing pressure. It is possible to masticate efficiently on the right and left sides at the same time.

The artificial posterior tooth having an occlusal surface formed as specified and shown each tooth is independent of any other tooth in the same, or in the opposing denture as far as position is concerned. That is to say, a bicuspid could be used in place of a molar or a molar in place of a bicuspid. If, for any special reason, all bicuspids would be used on one denture, any combination of bicuspids or molars could be used on the opposing denture.

An artificial posterior tooth with an occlusal surface serrated retains its original efficiency although at times ground for adjustments incident to changes in the base material or for other reasons. The same original efficiency may also be maintained over a period of years during the natural resorption and other changes in the ridges or because of natural wear in use. Should it become necessary for any reason whatsoever to destroy or change the original occlusal surface the occlusal surfaces may be restored to their original efficiency by recutting the grooves with a "Joe Dandy" cutter or other suitable grinding or cutting tool.

Thus it will be seen that I provide a tooth designed or formed to provide for an effective mastication of food and for an effective escape of food in a plurality of directions during pressure of mastication and especially since all grooves in the occlusal surfaces of the posterior teeth interconnect and lead from the occlusal surfaces laterally outwardly with respect to the sides of the teeth.

Reference to Fig. 5 wherein the general plane of the posterior teeth are shown in occlusion, the general line or plane of occlusion may be at the line A. R. or at the line A. S. or at a line any place between the lines A. R. or A. S. or similar to these lines. This line, plane or occlusal surface is established in the mouth during the construction of the dentures. This line of occlusion is never the same on the right side as on the left side of the mouth and it is never the same in two different people. The line of occlusion (A. S.) changes with the changes of the underlying structure of the denture, viz., the ridge of the maxilla or mandible. This change, commonly called the "settling" of the denture, is, therefore a variant in the occlusal plane and manifests itself as such at some time or other in practically every denture made.

It will be noted in Fig. 7 that the condyle **16** is in an advanced position in the glenoid fossa **17**. The natural curve (usually concave) of the glenoid fossa **17** is peculiar to the individual and is never the same on the right and left sides of a person. It is the natural movement of the condyle head **16** in the glenoid fossa **17** which produces the curve of Spee **18**. Some form of the curve of Spee is found in all natural teeth. The mandible is a triangle which, in its lateral movements, moves around two or more rotation centers. It is this fact, in connection with the fact that all glenoid fossae are different, that causes the curve of Spee **18** (Fig. 7) to be different in each individual. It is also responsible for the fact that the plane A. S. (Fig. 5) is also correlated and regulated by the movement of the condyle **16** in the glenoid fossa **17**. Since the mandible is a triangle moving around two or more rotation centers, it cannot make any movement in a straight line; all movements are in an arc.

Thus will be seen the ease with which the lower (and movable) denture, constructed in accordance with the present invention may pass from right to left and anero-posteroly on a self made path according to the guidance of the condyle **16** in the glenoid fossa **17** without occlusal interference, a condition highly desired in the construction of all artificial dentures.

What is claimed is:

1. An artificial posterior tooth having a serrated occlusal surface providing a plurality of elevated flat portions and a plurality of communicating grooves extending entirely across the occlusal surface spacing the flat portions from each other, said flat portions lying in the same plane and said grooves being of uniform depth and diameter to eliminate food pockets and all of the grooves being disposed in the same plane with relation to the occlusal surface, the outermost grooves opening laterally outwardly at the sides of the tooth to provide escapage of foods from and through the grooves during the masticating stroke, regardless of the direction of opposing pressure, said flat portions being subject to a grinding action to fit the curved plane established by the jaw of each individual patient, and said grooves being restorable for adjustment purposes or to normal condition after the flat surfaces have been ground.

2. An artificial posterior tooth having a serrated occlusal surface providing a plurality of elevated flat portions and a plurality of separate communicating grooves extending entirely across the occlusal surface and being of uniform depth

and diameter and spacing the flat portions from each other, said flat portions lying in the same plane and all of the grooves being disposed in the same plane with relation to the occlusal surface, said flat portions being subject to a grinding action between the grooves to fit the curved plane established by the jaw of each individual patient, and the grooves being restorable to normal condition after grinding of the flat surfaces, the outermost grooves opening laterally outwardly of the four sides of the tooth to provide efficient escape of the food in four directions from the beginning to the end of the masticating stroke and regardless of the direction of the opposing pressure.

3. An artificial posterior tooth having the occlusal surface thereof provided with a plurality of flat portions and a plurality of substantially V-shaped communicating grooves extending entirely across the occlusal surface and spacing said flat portions from each other and all arranged within the occlusal surface area of the tooth with the outermost grooves opening outwardly laterally at the sides of the tooth, said grooves being of uniform diameter and depth throughout their lengths, preventing food pockets in the side walls of the grooves and all of the grooves being in the same plane with relation to the occlusal surface, said flat portions being disposed in the same plane with relation to one another and being subject to a grinding action to fit them to the curved plane or surface established by the jaw of each individual patient.

4. The combination with upper and lower dentures, each carrying artificial posterior teeth having serrated occlusal surfaces providing a flat

portion and grooves of uniform depth and diameter extending entirely across the occlusal surface and leading outwardly laterally of the sides of the respective tooth, the serrated occlusal surfaces of opposing teeth being non-interlocking and independently operable to crush and tear food and to discharge the same through said grooves independently of other teeth and regardless of the direction of the opposing pressure, the flat portion of each tooth being subject to grinding for adjustment purposes so as to fit the curved plane or surface established by the jaw of each individual patient, and the grooves being restorable to normal condition after the surface of the flat portion has been ground.

5. The combination with upper and lower dentures, each carrying artificial posterior teeth, each posterior tooth having serrated occlusal surfaces providing a plurality of spaced flat surfaces changeable as to form to fit the curved plane established by the jaw of each individual patient, and a plurality of communicating grooves of uniform depth and diameter to eliminate food pockets leading outwardly laterally of the sides of the respective teeth to convey masticated food laterally from between opposing teeth during the masticating stroke, the opposing teeth having their serrated occlusal surfaces formed on a line to provide for mastication on both sides of the dentures at the same time and permitting escapage of the food in various directions regardless of the direction of pressure applied against the flat surfaces of the opposing occlusal surfaces or as regards the line of occlusal meeting of the opposing occlusal surfaces.

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