W. F. SLACK.

ARTIFICIAL TOOTH.

APPLICATION FILED FEB. 24, 1919.

1,312,141.

Patented Aug. 5, 1919.

Fig. 1

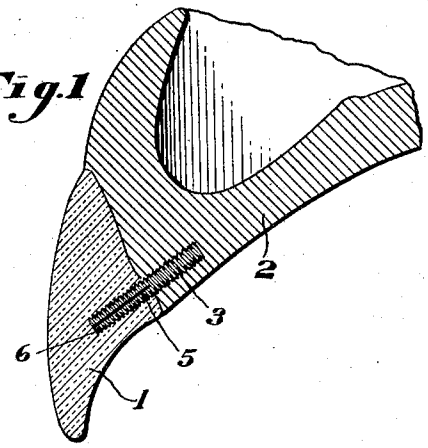


Fig. 2

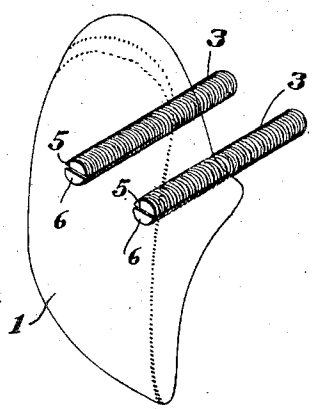


Fig. 3

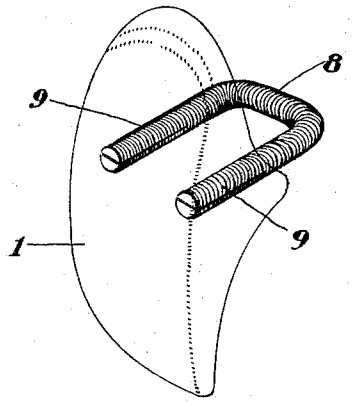
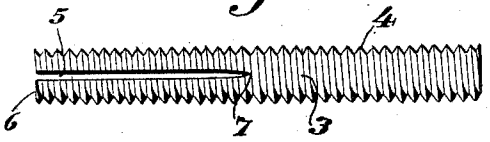


Fig. 4



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ARTIFICIAL TOOTH.

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To all whom it may concern:

Be it known that I, WILLIE F. SLACK, a citizen of the United States, and a resident of Manchester, county of Hillsborough, and State of New Hampshire, have invented an Improvement in Artificial Teeth, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to an improvement in artificial teeth and more particularly to the means for attaching such teeth to a plate, such as rubber, celluloid, or other suitable character.

Heretofore it has been the common practice to form artificial teeth of a suitable composition such, for instance, as porcelain, and to provide an anchorage between the teeth and the plate to which the teeth are to be secured, such anchorage usually comprising a platinum pin. When the artificial teeth have been heretofore subjected to the firing operation, the platinum pin or anchor has been embedded in the porcelain tooth and as the tooth cooled after the firing operation, the coefficient of contraction or, conversely, of expansion between the substance of which the tooth is composed and that of the anchor or platinum pin, has been such as to cause the porcelain to crack. This is due to the fact that as the porcelain contracts about the embedded platinum pin, its contraction is impeded by the less contractibility of the pin itself as the parts cool. Under these circumstances something must give way and this has been usually the material or porcelain of which the tooth is composed. The crack usually extends transversely of the lingual or labial surface, although this is not always the case. The crack thus formed or the line of weakness thus produced, is usually not visible to the naked eye, but it exists to such an extent that after the teeth have been secured to the plate and are subjected to the usual strains incident to their use, the teeth are found to give way or break along the line of weakness produced by the differential contraction of the material of the tooth and that of the pin or anchor.

One of the objects of the present invention is to provide an artificial tooth with an anchor which will not interfere with the uniform contraction of the material of the tooth as the tooth is cooled after the firing process, and will permit such relative contraction between the material of the tooth and the pin or anchor, as to obviate the formation of a line of weakness or crack in the tooth.

Another feature of the present invention consists in providing an artificial tooth with an anchor or pin of such character that it will effectively hold the tooth to the plate into which the anchor projects. In carrying the invention into practical effect, the anchor or pin is usually and preferably formed of a metal rod of suitable size provided on its exterior surface with barbs or projections which may be produced most readily in the form of screw threads. When such form of anchor is embedded in the porcelain of the tooth when the latter is shrunk or contracted during cooling, manifestly the pin becomes secured permanently and uniformly throughout the embedded portion thereof in the material of the tooth.

In order to permit the differential expansion of the material of the tooth or porcelain and that of the anchor or pin, the pin is provided with a slot in the end thereof which projects into the material of the tooth, such slot permitting movement of the two or more parts of the pin toward or from each other due to the contraction and expansion of the material of the tooth. I have found excellent results to follow from providing the pin with a single slot extending from the embedded end portion of the pin toward the inner portion of the tooth, but, obviously, the pin may be provided with more than a single slot and in some cases such duplication or multiplication of slots may be desirable.

In the drawing:

Figure 1 is a section view on an enlarged scale showing an artificial tooth secured to the backing or plate in accordance with the present invention;

Fig. 2 is a perspective view showing in general outline the artificial tooth with the anchors or pins embedded therein;

Fig. 3 is a view of a slightly modified form of anchor or pin and its relation to the artificial tooth;

Fig. 4 is an enlarged view representing one of the pins in Fig. 4, the enlargement being multiplied many times in order to make clear the characteristic features thereof.

In the drawings, the artificial tooth 1 may be formed of any suitable substance such,

for instance, as porcelain, and the plate 2 to which the artificial tooth is to be secured, may be likewise formed of any suitable material, such as rubber, celluloid, or the like.

In order to secure the tooth to the plate, an anchor or pin 3 is provided with a roughened exterior surface, preferably formed as screw threads 4, although, as will be evident, the roughened characteristic of the outer surface of the anchor or pin 3 may be otherwise produced. It is preferable to form the anchor or pin with the roughened or threaded surface throughout its length for the reason that the material of the tooth in contracting during the cooling operation following firing, will flow or enter the valleys or shallow places between the tooth and the anchor or pin throughout the length of the embedded portion and serve to provide a permanent and secure connection between the tooth and anchor or pin.

As hereinbefore pointed out, the coefficient of expansion and contraction of the substance of the tooth and the substance of the pin or anchor differ, and heretofore the result has been that a crack either visible or invisible has usually extended across or transverse to the lingual surface of the tooth which eventually permits the tooth to collapse or break during use. To effectually overcome this defective condition of the artificial tooth when secured to its anchor or pin, I have found that by slotting the pin, preferably throughout the portion embedded in the tooth, the substance of the latter, in cooling, may contract by more or less closing the slot of the anchor or pin and thereby prevent the formation of visible or invisible cracks.

In the present instance of the invention, the anchor or pin is provided with a slot 5 preferably extending from the end 6 of the pin to a point 7 longitudinally of the anchor or pin and approximately or preferably throughout the portion of the pin embedded in the material of the artificial tooth, as indicated in Fig. 1.

When the anchor or pin 3, slotted as described, is placed in the material of the tooth while the latter is in plastic or semi-plastic condition, the slot 5, much magnified in the drawings, receives little or none of the plastic material of the tooth, the consequence being that when the material of the tooth is cooled after firing, the slot 5 furnishes a sufficient yield between the pin and the material of the tooth during contraction to permit full contraction of the latter without rupture or the formation of visible or invisible cracks.

While the single slot 5 has been indicated in the pin 3 it will, of course, be understood that several such slots may be provided at angular relation to each other and extend longitudinally of the anchor or pin.

In some cases a single anchor or pin 3 will be quite sufficient, in view of the roughened exterior surface thereof, to hold an artificial tooth to its backing or plate, but in some instances two or even more may be employed, as indicated in Fig. 2.

The anchor or pin may take various forms, as indicated in Fig. 3 where the anchor or pin 8 is formed substantially U-shape, its end portions 9 being embedded in the substance of the artificial tooth 1 and each of said end portions being provided with the longitudinal slot and roughened exterior surface, substantially as described hereinbefore.

Claims:

1. An artificial tooth provided with an anchor or keeper comprising a pin having one end embedded in the material of the tooth and provided with a slot extending longitudinally of the anchor or keeper to permit contraction of the tooth as it is cooled.

2. An artificial tooth having an anchor or pin embedded therein and provided with a longitudinal recess extending throughout the portion of the pin embedded in the artificial tooth to permit uniform contraction of the tooth in cooling, and having a roughened or tooth surface extending transversely to the general longitudinal dimension of the anchor or pin and about the longitudinally recessed or slotted portion.

In testimony whereof, I have signed my name to this specification.

WILLIE F. SLACK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."