Nov. 18, 1924. 1,516,003

J. B. DAVIS

ARTIFICIAL TOOTH

Filed Dec. 31, 1914

FIG. 1.

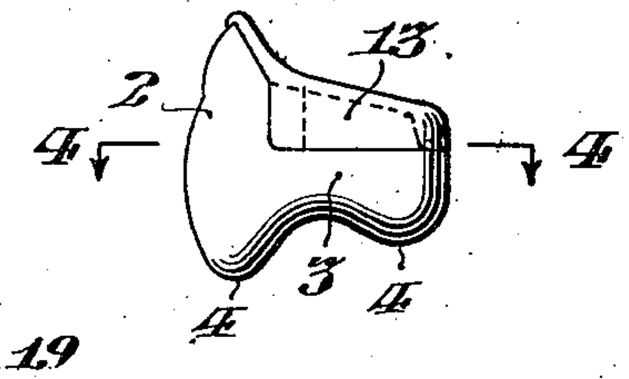


FIG. 2.

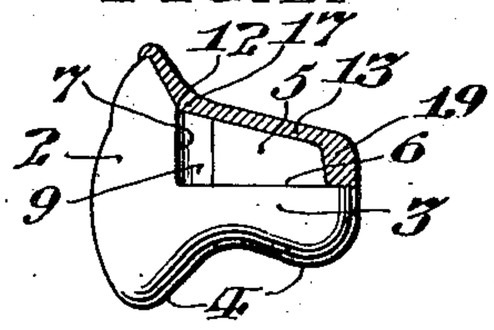


FIG. 3.

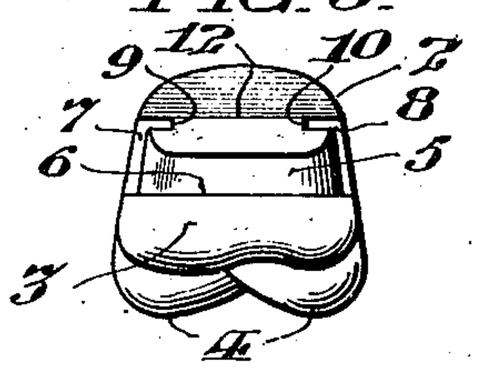


FIG. 4.

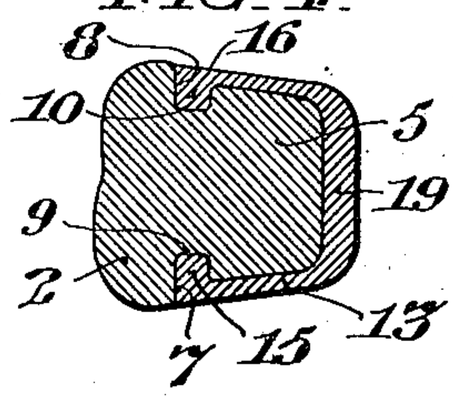


FIG. 5.

FIG. 7.

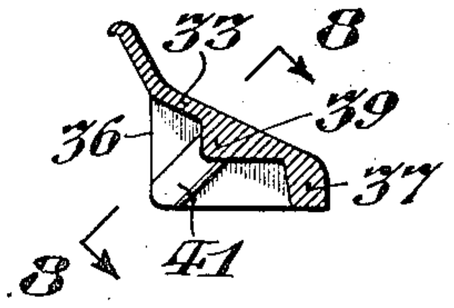


FIG. 8.

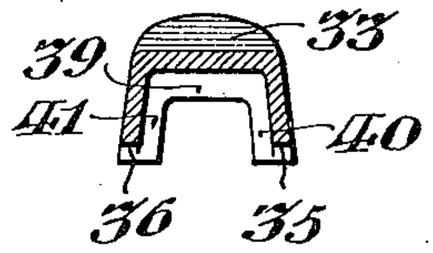


FIG. 6.

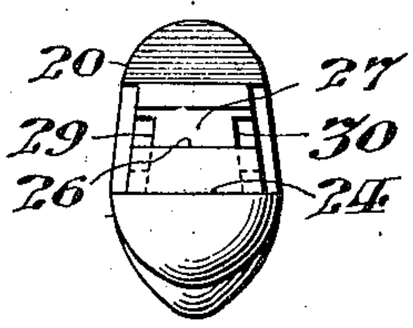


FIG. 10.

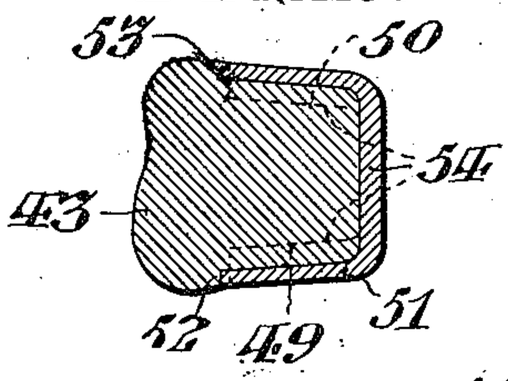


FIG. 9.

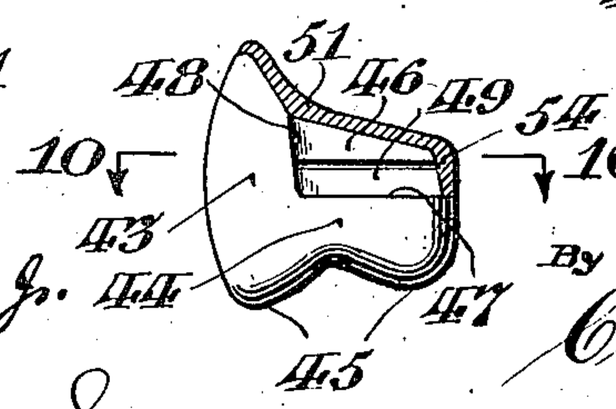
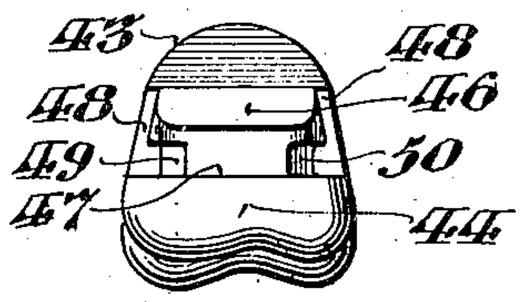


FIG. 11.



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UNITED STATES PATENT OFFICE.

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ARTIFICIAL TOOTH.

Application filed December 31, 1914. Serial No. 879,877.

To all whom it may concern:

Be it known that I, JOHN B. DAVIS, a citizen of the United States, and a resident of Lansdowne, in the county of Delaware, State of Pennsylvania, have invented certain new and useful Improvements in Artificial Teeth, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates particularly to that class of artificial teeth which are commonly designated as interchangeable facings or crowns, and is especially directed to the means for detachably connecting the porcelain tooth body to the bridge pieces or plates.

The principal objects of my invention are, to provide a porcelain tooth-crown so shaped and proportioned as to be rigidly mounted in suitably shaped complementary socket members forming a cap, bridge or plate, affording a maximum rigidity in the support of said tooth-crown with a minimum amount of metal, and permitting replacing of the tooth-crown without removing the metallic framework from the mouth of the patient.

Other objects of my invention are, to provide a tooth-crown having means for attaching it to a metallic support, so disposed as to permit of its being ground or otherwise altered for "short bite" cases or for any other purpose, without impairing or in any way weakening its means of attachment to said support; and to provide a tooth-crown whose means of attachment afford reinforcements in the backing so disposed as to offer substantial abutments in opposition to the possible stresses, for the supporting shoulders or ledges of the porcelain tooth body.

My invention comprehends a tooth-crown in which the body, including the cusps and the front are integrally formed of porcelain, and which may be removably engaged with suitably formed metallic cups providing sockets therefor, having reinforcing abutment ridges or ribs connected by relatively thin webs, and so disposed that when said cups are laterally joined to form a bridge or plate, the tooth supporting structure will comprise a shell having a skeleton frame whose reinforcing bars or ribs are braced by relatively thin interposed connecting webs.

My invention further includes all of the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is a side elevational view of a porcelain tooth-crown embodying a convenient form of my invention, fitted into its complementary metallic mounting cup; Fig. 2 is a side elevational view of the tooth-crown shown in Fig. 1, showing the metallic mounting cup in vertical longitudinal section for convenience of illustration; Fig. 3 is a rear elevational view of the tooth-crown shown in Figs. 1 and 2, per se; Fig. 4 is a horizontal sectional view of the tooth-crown and its mounting cup, taken on the line 4—4 in Fig. 1; Fig. 5 is a side elevational view of a modification of the tooth-crown shown in Fig. 1, showing its mounting cup in vertical longitudinal section for convenience of illustration; Fig. 6 is a rear elevational view of the tooth-crown shown in Fig. 5, per se; Fig. 7 is a vertical longitudinal sectional view of the mounting cup such as is associated with the tooth-crown shown in Fig. 5; Fig. 8 is a transverse diagonal sectional view of the mounting cup shown in Figs. 5 and 7, taken on the line 8—8 in Fig. 7; Fig. 9 is a side elevational view of another modified form of tooth-crown, showing its mounting in vertical longitudinal section for convenience of illustration; Fig. 10 is a horizontal sectional view taken through the porcelain tooth-crown and its mounting on the line 10—10 in Fig. 9; and Fig. 11 is a rear elevational view of the tooth-crown shown in Figs. 9 and 10, per se.

In the form of my invention shown in Figures 1 to 4, inclusive, the tooth-crown body, which is preferably formed of porcelain, comprises the integrally formed buccal facing 2, cusp facing 3 having the cusps 4, and lug 5 projecting inwardly in the angle of the respective facings and of such extent as to form a substantially horizontal marginal ledge 6 extending along the sides and back of the tooth-crown near the cusp end and terminating at the rear surface of the buccal facing, and the vertical marginal ledges 7 and 8 respectively extending along the lateral edges of said buccal facing 2.

Said lug 5 is provided at the intersection of its opposite sides and the rear surface of the buccal facing with substantially

vertical grooves or recesses 9 and 10, extending therethrough and respectively terminating at the ledge 6 upon the respectively opposite sides of said lug 5.

As best shown in Fig. 2, the rear surface of the buccal facing 2 slopes obliquely outward toward the gingival edge from its intersection with the gingival surface of the lug 5, which preferably slopes from said intersection rearwardly, inclining toward the occlusal plane of the tooth-crown.

It will be seen by reference to Figs. 2 and 3 that the intersecting sloping surfaces of the buccal facing 2 and lug 5 form an interior angle 12 extending across the tooth-crown body and connecting the grooves 9 and 10 (see Fig. 3), thereby substantially forming a continuous groove extending horizontally across the tooth-crown body and vertically upon opposite sides to the ledge 6. As shown by a comparison of Figs. 2 and 3, said ledge 6 is broader along the back of the tooth-crown body than at the sides thereof.

The tooth-crown above described is arranged to be detachably engaged with its complementary mounting cup 13, which provides a socket therefor and comprises a thin shell conforming to the inner surfaces of said tooth-crown and extending over the sides thereof with its edges abutted against the ledges 7 and 8 adjacent to the lateral edges of the inner surface of the buccal facing 2, and the ledge 6 extending around the edge of the cusp facing 3.

The mounting cup 13 is provided with ribs 15 and 16, projecting into the grooves 9 and 10 and extending from the occlusal edge which abuts against the ledge 6 along the vertical forward edges, and merges into the transverse rib 17 which extends transversely across the mounting cup 13 intermediate of its front and rear edges and enters the groove formed by the angle 12 in the tooth-crown body. The broadened ledge at the back of the tooth-crown affords space for a reinforcing rib 19 at the rear edge of the mounting cup.

It will be obvious from the foregoing description that the mounting cup 13 may form a cap which may be permanently secured to the natural tooth root in any well-known manner and provide a mounting in which the porcelain tooth-crown may be cemented, or said mounting cup may form a unit of a bridge or plate in which a plurality of such units of suitable conformation may be joined to form a unitary structure having a series of sockets for the reception of tooth-crowns of the desired form suitable to complete the dental arch.

It will be seen that when a plurality of mounting cups of the form contemplated are soldered together side by side to form a bridge or plate, the thickened rear edge forming the reinforcing rib 19 serves to form a continuous reinforcing bar substantially conforming to the dental arch. Likewise, the transverse rib 17 serves to form a similar bar extending substantially parallel with the bar formed by the ribs 19 and connected by relatively thin webs of metal extending over the inner surfaces of the tooth-crown and turned over the sides thereof, and reinforced by the transversely extending spurs comprising the lateral ribs 15 and 16.

By thus forming the tooth-crown mounting, such bridge or plate comprises a skeleton frame or network of reinforcing bars or ribs extending in the directions of possible stresses and connected by relatively thin webs which tend to brace said skeleton frame and prevent its distortion, whereby the greatest possible strength is attained with a minimum amount of metal.

In the form of my invention shown in Figs. 5 to 8, inclusive, the tooth-crown body comprises the buccal facing 20, the cusp facing 21 having the cusps 22, and the lug 23 extending rearwardly in the angle of the respective facings, and forming the substantially horizontal ledge 24 extending around the opposite sides and back thereof near the cusp end and the substantially vertical ledge 25 extending along the lateral edges of the buccal facing 20.

In this form of my invention, the gingival surface of the lug 23 is provided with the angularly disposed surfaces 26 and 27 forming the interior angle 28, providing a transverse groove parallel with but spaced somewhat behind the plane of the rear surface of the buccal facing 20.

Said lug 23 is also provided in its opposite sides with grooves 29 and 30 connected at their inner ends with the groove formed by the angle 28 and extending therefrom obliquely forward and terminating at the intersection of the ledge 24 and rear surface of the buccal facing 20.

The mounting cup 33, complementary to the form of tooth-crown shown in Figs. 5 to 8, inclusive, comprises a thin shel° of metal overlying the inner surfaces of said tooth-crown, with the forward edges 35 and 36 of its side walls abutted against the rear surface of the buccal facing 20, and with the incisive edge of its side and back walls abutted against the ledge 24.

The mounting cup 33 is provided along its rear edge with a reinforcing rib 37, and is provided intermediate of its front and rear edges with the transverse rib 39 which projects into the groove formed by the angle 28 in the tooth-crown, and merges into the lateral reinforcing ribs 40 and 41 respectively projecting into the grooves 29 and 30 in the tooth-crown.

It will be noted that the mounting cup 33 is in all respects similar to the mounting

cup 13 shown in Figs. 1 to 4, inclusive, except that its lateral ribs 40 and 41 instead of extending vertically, as in the mounting cup 13, extend obliquely with respect to the occlusal plane of the tooth-crown, so that the engagement of the tooth-crown with the mounting cup 33 will be effected in an oblique direction.

In the form of my invention shown in Figs. 9 to 11, inclusive, the porcelain tooth-crown comprises the buccal facing 43, cusp facing 44 having the cusps 45, and the inwardly projecting lug 46 forming the substantially horizontal ledge 47 near the cusp end of the tooth-crown, and the substantially vertical ledge 48 along the lateral rear edges of the buccal facing 43. Said lug 46 is provided upon its opposite sides with grooves 49 and 50 extending along the ledge 47 and terminating at the rear surface of the buccal facing 43.

The mounting cup 51, which is complementary to the form of tooth-crown shown in Figs. 9 to 11, inclusive, comprises a thin shell of metal overlying the inner surfaces of the tooth-crown, with its forward edges 52 and 53 of its opposite sides abutted against the ledge 48 at the rear surface of the buccal facing 43, and the incisive edge of the opposite sides and back abutting against the ledge 47 and having a continuous reinforcing rib 54 extending along said ledge and projecting into said grooves 49 and 50.

It will be obvious that a tooth-crown constructed in accordance with this invention may be ground to any desired depth without in any way weakening its means of support. This is especially advantageous in "short bite" cases.

Although I have specificially referred to the tooth-crown body as being formed of porcelain, and to the mounting cup as being formed of metal, it is to be understood that I do not desire to be limited to the precise details of construction, arrangement and material herein set forth, as it is obvious that various modifications may be made therein without departing from the scope of my invention as defined by the appended claims.

Having thus described my invention, I claim:

1. An artificial tooth, comprising a buccal facing, a cusp facing, and a lug in the angle thereof forming a marginal ledge along the inner surfaces of said facings, and having lateral grooves extending along the ledge, said ledge being relatively broader at the back than at the sides.

2. An artificial tooth, comprising a buccal facing, a cusp facing, a lug in the angle thereof forming a ledge along the inner surface of said facing, and having lateral grooves directed outwardly or labially toward said angle, and a transverse groove connecting said lateral grooves.

In witness whereof, I have hereunto set my hand this 30th day of December, A. D. 1914.

JOHN B. DAVIS.

Witnesses:
WILLIAM J. RUSSELL,
CLIFTON C. HALLOWELL.