No. 810,713. PATENTED JAN. 23, 1906.

J. M. CARD.

ARTIFICIAL DENTURE.

APPLICATION FILED JULY 28, 1905.

Fig. 1.

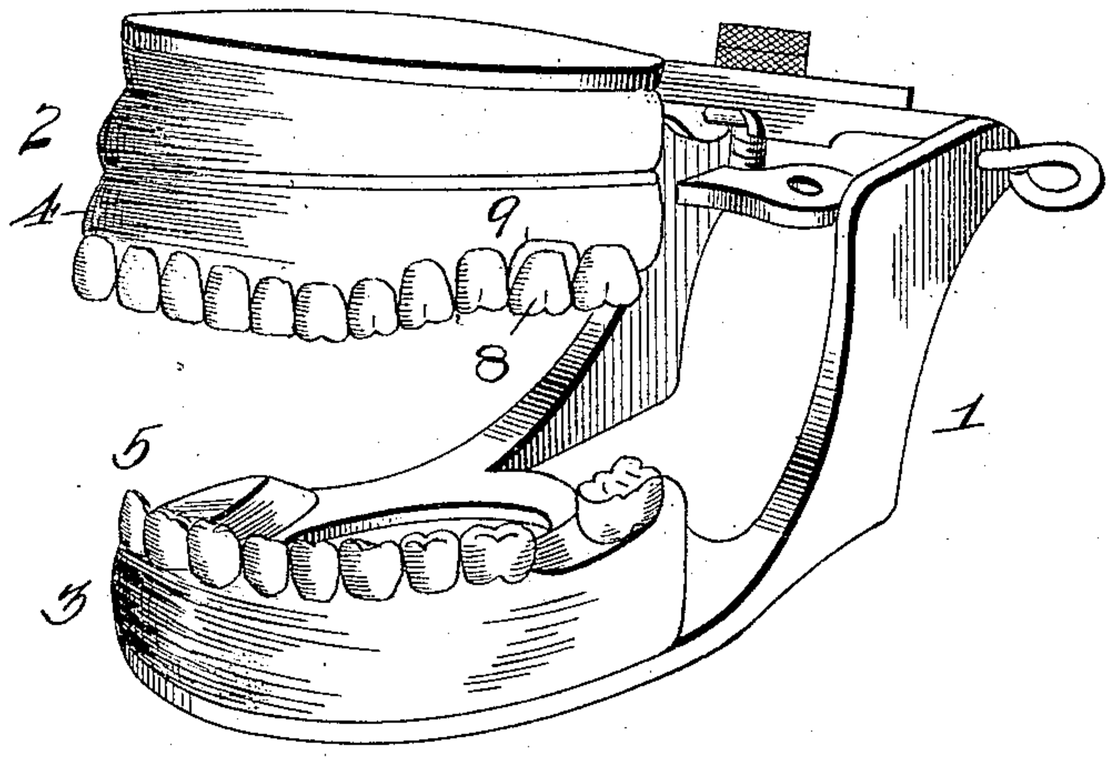



Fig. 2.

Fig. 3.

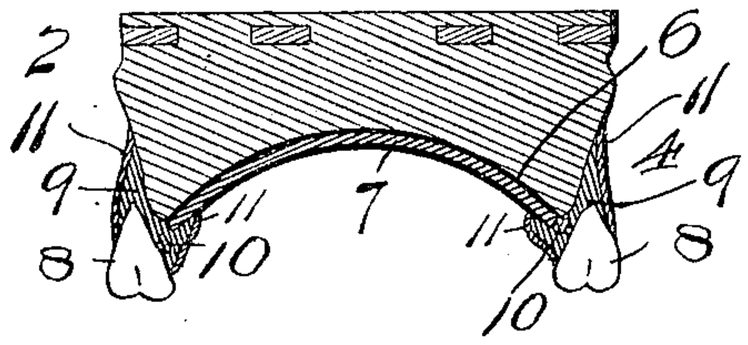



Fig. 5.

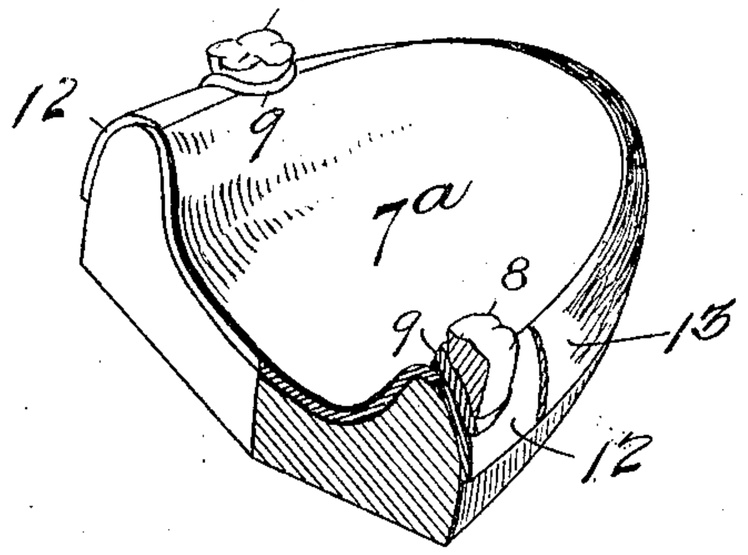
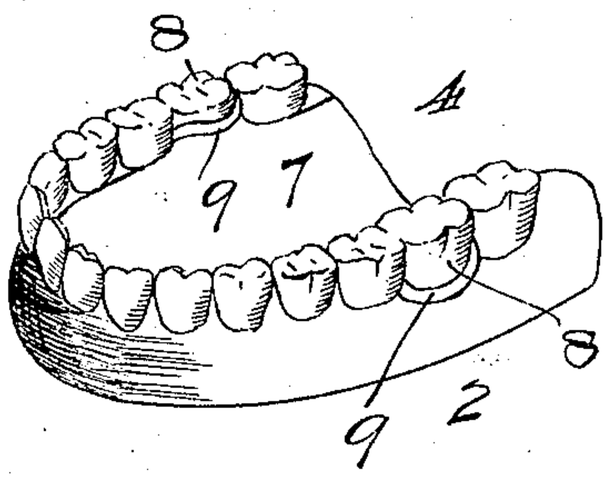
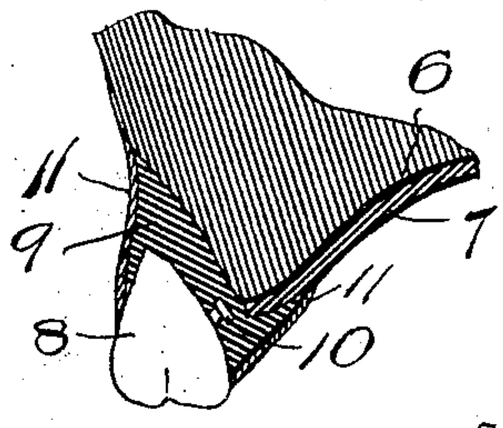



Fig. 4.




Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN M. CARD, OF OLEAN, NEW YORK.

## ARTIFICIAL DENTURE.

No. 810,713. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed July 28, 1905. Serial No. 271,612.

*To all whom it may concern:*

Be it known that I, JOHN M. CARD, a citizen of the United States, residing at Olean, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Artificial Dentures, of which the following is a specification.

This invention relates to the manufacture of artificial dentures or plates, and has special reference to a process wherein the several steps of making the plate, exclusive of the finishing operations of vulcanizing and polishing, are carried out while the model is on the articulator.

To this end the invention presents another modification of the invention covered by my companion applications, Serial No. 261,221, filed May 19, 1905, and Serial No. 269,100, filed July 10, 1905.

A special object of the invention is to provide simple and practical means for making an all ordinary dental-rubber plate with waxable rubber connections for the teeth to produce a plate of perfect form and articulation.

A further object in this connection is to provide a process involving a minimum amount of labor and time and a great saving in material.

With these and other objects in view the invention consists in the novel combination of steps hereinafter fully described and claimed.

The essential features of the invention involved in carrying out the objects above specified are susceptible to some variation without departing from the scope of the invention; but a preferred embodiment of the process and article are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an articulator illustrating the manner of carrying out the process in the formation of a partial plate to support and carry teeth at opposite or spaced points on the jaw. Fig. 2 is a reverse perspective view of the model shown on the articulator in Fig. 1. Fig. 3 is a cross-sectional view of the model shown in Figs. 1 and 2, the line of section including the oppositely-located teeth carried by the plate. Fig. 4 is an enlarged detail sectional view illustrating more clearly the individual tooth-fastening. Fig. 5 is a perspective view, partly in section, of a modification of the process and illustrating a model for a complete plate with a full set of artificial teeth, the view showing only two teeth to exemplify the individual mounting thereof.

Like reference-numerals designate corresponding parts in the several figures of the drawings.

In carrying out the invention the steps of the process are taken up after the bite-casting and the denture model are placed upon the jaws of the articulator, as fully set forth in my other applications aforesaid. Hence for illustrative purposes there is shown in the drawings an ordinary articulator 1, embodying the upper and lower jaw members 2 and 3, which, respectively, carry the denture model 4 and the bite-casting 5.

Inasmuch as the present process possesses special utility in the formation of a partial plate for supporting and carrying artificial teeth at opposite or spaced points on the jaw, there is shown in Fig. 1 of the drawings and the related figures a model presenting oppositely-arranged tooth vacancies. The process will be first described in its application to the production of such a plate. After placing the model 4 on the articulator in the usual way the first step in the process is to coat that portion of the model over which the plate and its connections are to extend with a thin solution of rubber dissolved in chloroform or other solvent, said coating constituting a primary rubber coating designated by the numeral 6 in the drawings. Then the plate-body 7 is formed by slightly warming a sheet of ordinary dental rubber, which is cut to shape and applied on the lingual surface of the model over the rubber coating. It is preferable in the application of the rubber sheet 7, which constitutes the body or base of the plate, to so arrange such sheet that the marginal edges thereof in the case of a partial plate will project into the tooth vacancies onto the alveolar ridge of the model. After thus applying the rubber sheet or plate 7 any surplus margins are trimmed off, thus placing the work in condition for the articulation of the teeth, which is the next step in the process.

The positions of the artificial teeth 8 are determined in the usual way, and in the case

of a partial plate such as being described the tooth for each vacancy is set into such vacancy and secured to the plate-body through the medium of a waxable rubber connection 9. This waxable rubber connection 9 in its method of application constitutes one of the distinctive features of the invention, and the same consists of what may be properly termed a "plastic holding-boss" of waxable rubber. It has been found by practical experience that the ordinary dental rubber such as used for making the plate-body or base 7 unites perfectly with the waxable rubber, and thereby secures an exceptionally strong connection for the teeth with the plate supporting the same.

The plastic holding-boss or waxable rubber connection 9 is first heated and the anchoring-pins 10 of the tooth pressed into the same, after which the said boss or rubber connection is heated again and pressed with the tooth into the tooth vacancy. In thus positioning or articulating the tooth with its holding-boss or rubber connection 9 the latter is pressed over and onto the margin of the plate-body 7 at the alveolar ridge and is also worked around and onto the labial surface of the model. It is then preferable to trim off the waxable rubber and apply over the same a thin solution of rubber, after which a thin strip 11 of ordinary dental rubber is placed over the exposed surfaces and edges of the waxable rubber boss or connection. The said thin finishing-strip 11 of ordinary dental rubber will adhere very tenaciously to the waxable rubber and teeth and fill any vacuum that may exist.

When the teeth are articulated at two or more points on a partial plate, as above described, the model is cut from the articulator and invested in a dental flask. Then the usual operations of vulcanizing and polishing are proceeded with for finishing the plate.

A modified form of plate produced by the process is shown in Fig. 5 of the drawings. In forming this plate the process is the same in all essential particulars as employed in forming the partial plate referred to, but for illustrative purposes the modified plate is shown formed upon a model designed for a complete plate with a full set of artificial teeth.

The distinctive feature in connection with the modified plate referred to is that in addition to the rubber plate body or base $7^a$, extending over the lingual surface and onto the alveolar ridge of the model, there is employed a labial strip 12 of waxable rubber, which extends about the labial surface of the model and overlaps the margin or the plate body or base on the alveolar ridge. The artificial teeth are articulated upon the plate body or base, and its labial strip 12 in the same manner as already described, and it is then preferable in the case of a full plate to finish off the labial surface by applying pink or gum-colored rubber 13 thereto. This rubber is best applied by placing small pieces in the interstices between the teeth and then laying a strip of the said pink or gum-colored rubber over the labial surface or over as much of said surface as is necessary to cover the intersticial filling. The remaining exposed labial portions of the work are finished up with ordinary dental rubber, such as the strips or pieces 11 described in connection with the partial plate.

From the foregoing it is thought that the method or carrying out the invention in its application to different forms of dental plates would be readily apparent to those familiar with the art without further description.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent, is—

1. A process of making dental plates which consists in forming a model and fastening it to the articulator, then applying a dental-rubber sheet to the lingual surface of the model with the margins thereof extended upon the alveolar ridge, then setting the teeth in a holding-boss of waxable rubber, and then applying said waxable holding-boss upon the marginal edge of the dental-rubber sheet at the alveolar ridge.

2. A process of making dental plates which consists in forming a model and fastening it to the articulator, then applying a dental-rubber sheet to the lingual surface of the model with the margins thereof extended upon the alveolar ridge, then setting the teeth in a boss of waxable rubber, applying said waxable holding-boss over the alveolar ridge and labial surface and upon the marginal edge of the dental-rubber sheet, then removing the model from the articulator and finally vulcanizing and polishing the plate.

3. A process of making dental plates which consists in forming a model and fastening it to the articulator, then coating that portion of the model over which the plate and its connections are to extend with a rubber solution, applying a dental-rubber sheet upon the coating made by said solution, said sheet being arranged to extend over the lingual surface and upon the alveolar ridge, then setting the teeth in a boss of waxable rubber and applying the latter to the alveolar ridge and labial surface and upon the marginal edge of the dental-rubber sheet, finishing the exposed edges of the waxable rubber with dental rubber, and finally removing the model and vulcanizing and polishing the plate.

4. A process of making dental plates which consists in forming a model and fastening it to the articulator, applying a dental-rubber

sheet to the lingual surface of the model, then arranging a labial strip of waxable rubber about the labial surface of the model in overlapping relation to the margin of the dental-rubber sheet on the alveolar ridge, next setting the teeth in a boss of waxable rubber and applying the latter over the joint between the lingual sheet and the dental strip, and finally removing the model and vulcanizing and polishing the plate.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN M. CARD.

Witnesses:
E. D. NEWTON,
W. H. CARD.