Jan. 8, 1924. 1,479,946

C. B. WARREN

DENTURE MODEL FORMER

Filed Feb. 19, 1923

Fig. 1.

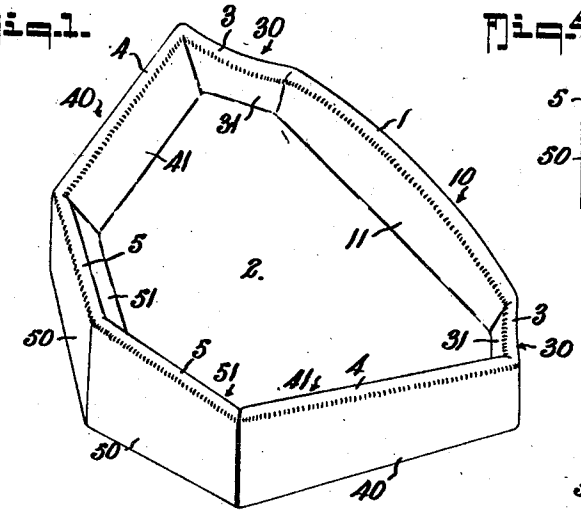


Fig. 4.

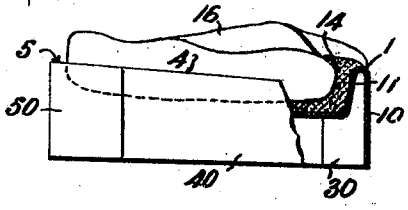


Fig. 2.

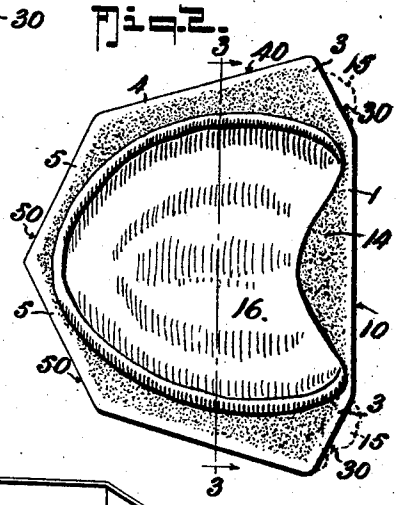


Fig. 5.

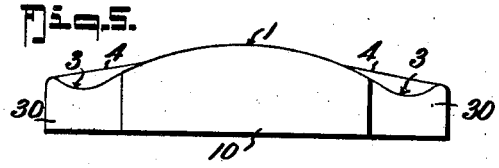


Fig. 3.

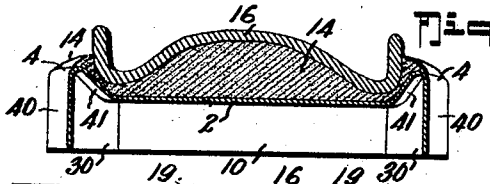


Fig. 7.

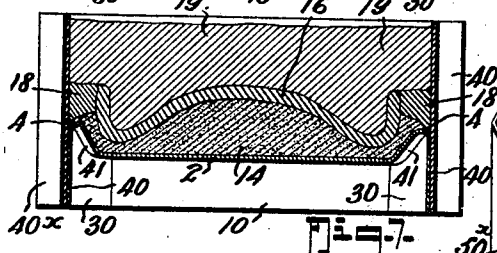
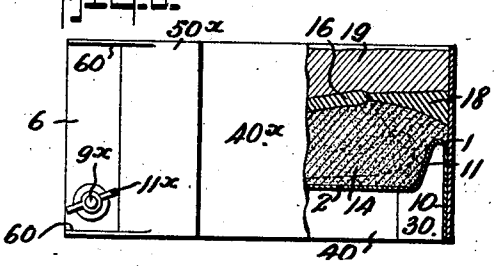


Fig. 8.



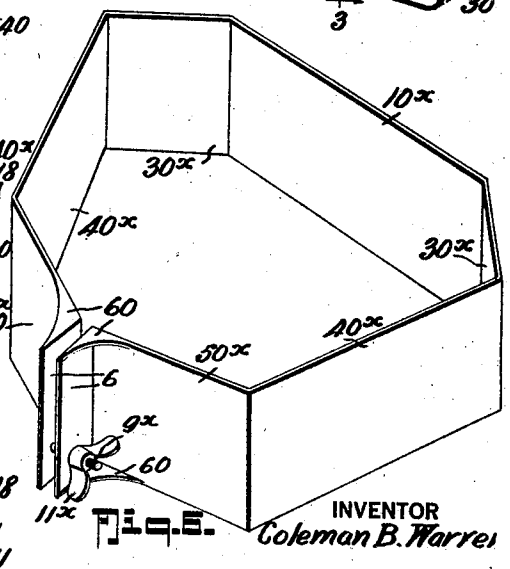


Fig. 6.

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UNITED STATES PATENT OFFICE.

COLEMAN B. WARREN, OF NORFOLK, VIRGINIA.

DENTURE-MODEL FORMER.

Application filed February 19, 1923. Serial No. 620,000.

To all whom it may concern:

Be it known that I, COLEMAN B. WARREN, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented a new and useful Improvement in Denture-Model Formers, of which the following is a specification.

My present invention, which generally relates to making denture models in the art of dentistry, more particularly has reference to improvements on that type of denture model formers disclosed in my copending application, Serial No. 599,551, filed November 7, 1922 and which, in its generic nature, embodies a complete set of model formers, i. e., two matrix formers, one for the upper matrix and one for the lower matrix, and two stone model formers, the latter being exact duplicates.

My present invention comprehends generally the provision of an improved construction of matrix former whereby matrix formers of more practical and neater design are produced and whose structure and cooperation with the model formers is such that much less plaster is required in forming the matrix than is necessary when making the matrices with the type of formers disclosed in my copending application referred to.

Another and essential feature embodied in my present invention is making the matrix formers of a solid cup shape member and in such shape that the operation of assembling the matrix formers and the model formers and the separation of the model former from the impression is simplified and rendered more convenient than is possible in the use of the denture model former devices shown and described in my other application mentioned.

As in my other application referred to, my present invention comprises a complete set of model formers and matrix formers, one of the latter formers being used for investing the upper impression, and the other for investing the lower impression. The two matrix formers which are exact duplicates, in my present case, are especially designed for a better coaction with the model formers and particularly for being separated from the model formers, and to provide for the better separation of the model former from the matrix than is possible in the use of the denture appliances disclosed in my copending application mentioned.

With other objects in view and hereinafter stated, subordinately my present invention consists of certain novel features of construction, combination and arrangement of parts fully explained in the following detailed description, specifically pointed out in the appended claims and illustrated in the accompanying drawing, in which:—

Figure 1 is a perspective view of one of my matrix formers.

Figure 2 is a plan view of the same with the plaster in place and the impression invested; the outflowing or excess plaster displaced when making the matrix, being indicated as passing out over the end portions of the posterior wall of the former.

Figure 3 is a cross section on the line 3—3 of Figure 2.

Figure 4 is a part side elevation and a part central vertical section of the same.

Figure 5 is an end view of the posterior portion of the former shown in Figures 1 to 4.

Figure 6 is a perspective view of one of the model formers hereinafter explained.

Figure 7 is a cross section of the same with the matrix in place and illustrating the artificial stone modelling material and the separating medium.

Figure 8 is a side elevation of the same before the modelling stone mix has been compacted, parts being broken away to show the contents of the model former.

In the practical development of my present improvements in dental model formers, two matrix formers of like construction are used in a complete set of my improved devices, one for the upper and the other for the lower impression, and since the construction of both is the same a detailed description of one of the matrix formers and its cooperative combination with a stone model former will be sufficient.

As is clearly shown in the drawing, my present construction of matrix former is in the nature of a cup shaped body that is preferably stamped to the shape shown from a single piece of sheet brass or other suitable metal to produce a practically rigid member, and the said matrix former includes a back wall 10 whose upper edge 1 curves upwardly from the opposite ends to the center thereof and whose ends merge with short diverging wall portions 30—30 which in turn merge with opposite converging side walls 40—40 whose forward ends merge with anterior wall portions 50—50

which further converge and meet at the central longitudinal line of the former. The upper edges 5—5 of the walls 50—50 incline upwardly from their outer end to their juncture and the upper edges 4—4 of the walls 40—40 incline downwardly from their front to their rear ends, the reason for which will presently appear.

As will be readily understood from the drawing, the surrounding walls of the cup shaped body each include a turned upper edge and the said upper edges of the several walls, which merge with their respective outside vertical wall portions 10—30—40—50, also merge with inwardly and downwardly inclined portions 11, 31, 41, 51 which in turn merge with the bottom 2 of the cup.

By making the matrix former of a single piece of metal shaped up as stated and shown, the same is sufficiently rigid to maintain the inclined portion of the walls and the walls proper from buckling outwardly and distorting impression under the pressure of compacting the artificial stone mix, as will be further explained.

In my present construction, the back wall 10 extends upwardly to a height substantially that of the highest point of the front walls 50—50, and the said walls 50—50 as also the side walls 40—40 gradually taper down to a relatively shallow point where the side walls 40—40 merge with the short diverging walls 30—30, the latter having their upper edges 3—3 downwardly curved, to provide for the outflow of the excess mass, when making the matrix, as indicated by 15 on Figure 2.

In my present construction, raising the back walls as shown and gradually tapering the tops of the front and side walls gives an approximate peripheral outline of the average impression and provides a uniform thickness of plaster in matrix and lessens the probable warpage of impression when plaster sets.

Giving the matrix tray approximately the same peripheral outline as the impression, the periphery of the impression being always higher, provides for outflow of surplus plastic material over the shallow or top portion of tray 3—3 instead of over the periphery of impression while same is being invested.

14 designates the plaster matrix, 15 the overflowing material and 16 designates the impression.

In my present development of denture modelling appliances, the former for holding the matrix and which serves as the container for the modelling composition, is of substantially the same external contour as that of the matrix former, and as shown the said model former is shaped from a stout spring metal blank into a substantially rigid member, that includes the posterior wall portions 10^x—30^x, opposite side walls 40^x and the anterior front walls 50^x—50^x, the latter terminating at their meeting ends in outwardly bent flanges or ears 6, that the strengthened by angle braces 60—60 rigidly attached to or formed in any manner, at the upper and lower edges of the ears 6 and their respective wall portions 50^x, and in order that clamping force may be applied to cause the ears 6—6 to close together and clamp the matrix holding former, said ears 6—6 are provided with screw bolt and winged nut devices 9^x—11^x which provide a simple and convenient means for drawing the opposing or springy ends of the model former together, as conditions may require.

When using my present construction of denture model former for pouring an impression, the impression is taken in the usual way, that is,—the cup shaped former is set on a table or slab and the plastic material is poured into it to a depth sufficient to permit embedding or investing the impression, it being understood that the sloping wall portions provide for considerable spreading of plastic material without danger of flowing over the back, the side, or the front wall portions, since much of the material will flow out of the passages 3—3 and over the sides 4—4 of the tray. The passage 3—3 is not intended to accommodate all over-flow of excess plastic mass, the peripheral outline of matrix tray is enough lower than that of the impression all around at every point that plaster may flow over at any point of tray before it would go over into the impression. If plaster should be allowed to go over the periphery of the impression it would spoil the impression.

As is clearly shown in Figure 2, a flat rim portion 14 of the plastic mass surrounds the impression 16, and the said portion 14 constitutes a seat onto which is placed a thin separating medium 18. This separating medium, preferably artist's clay, serves two purposes, first to prevent stone model from sticking to matrix, second to build up a uniform periphery on the impression.

After the separating medium 18 has been put in place, the modelling former, best shown in Figures 7, 8 and 9, is fitted over the matrix former, the outer vertical walls of which provide a substantial surrounding bearing surface for being engaged by the several wall sections of the model former. After the model former is clamped over the matrix former with the impression embedded in the plastic mass contained in the matrix former cup, the split ends of the model former are drawn together by the screw bolt and nut devices, to tightly fit the model former against the walls of the matrix former and with the upper portion of the model former extended some dis-

tance above the matrix former. The thin border of clay 18 being applied, as stated and shown, the modelling plastic is poured into the set up model former and worked in the usual way, to expel the air.

After the modelling composition has hardened or set, the model former is unclamped to sufficiently free the model 19 and permit of pushing the cup shaped former with the impression and the model from within the outer or model former, after which the model is readily separated (the clay binder facilitating such separation) from the impression and the matrix, the latter being then complete and ready for use for the manufacture of artificial dentures.

What I claim is:

1. In dental model formers, a metal cup including a back wall portion whose ends terminate in forwardly diverging portions, forwardly converging side wall portions and forwardly converging front wall portions, the several wall portions being continuous and each including inward and downward inclines that merge with the bottom of the cup.

2. In dental model formers, a metal cup including a back wall portion whose ends terminate in forwardly diverging portions, forwardly converging side wall portions and forwardly converging front wall portions, the several wall portions being continuous and each including inward and downward inclines that merge with the bottom of the cup, the several wall portions including outside vertical members that extend below the bottom of the cup.

3. In dental modelling, a matrix former comprising a substantially rigid single piece metal cup which includes a bottom, a back wall, converging side walls, wall portions connecting said back wall with said converging side walls, and converging front walls that extend above and below the said bottom and inwardly and downwardly inclined portions that join the bottom with the upper edges of the back, the sides and the front walls and with said connecting wall portions and constitute the confines of the cup in which the material for receiving the impression is held, and means for confining a plastic mass upon the impression while invested in said cup held mass, and for frictionally engaging the surrounding walls of the matrix forming cup.

4. As a new article, a dental matrix former comprising a cup shaped body formed of a single piece of sheet metal, and including a back wall, converging side walls and converging front walls whose inner ends terminate in the central longitudinal line of the cup, the several walls joining to form a continuous rim edge for the cup, the top of the said rim gradually tapering downwardly from the meeting ends of the front walls to the back end of the side walls, the said cup shaped body also including diverging wall sections that join the ends of the back wall with the side walls, the upper edge of the back wall being upwardly curved from the opposite ends to the center and the diverging wall sections having concaved top edges that constitute a peripheral level lower than that of the impression, which provides for overflow of plastic material from the cup during the act of investing impression.

COLEMAN B. WARREN.