Sept. 14, 1926.

1,599,487

L. J. PORTER

MOLD

Filed Feb. 26, 1926

2 Sheets-Sheet 1

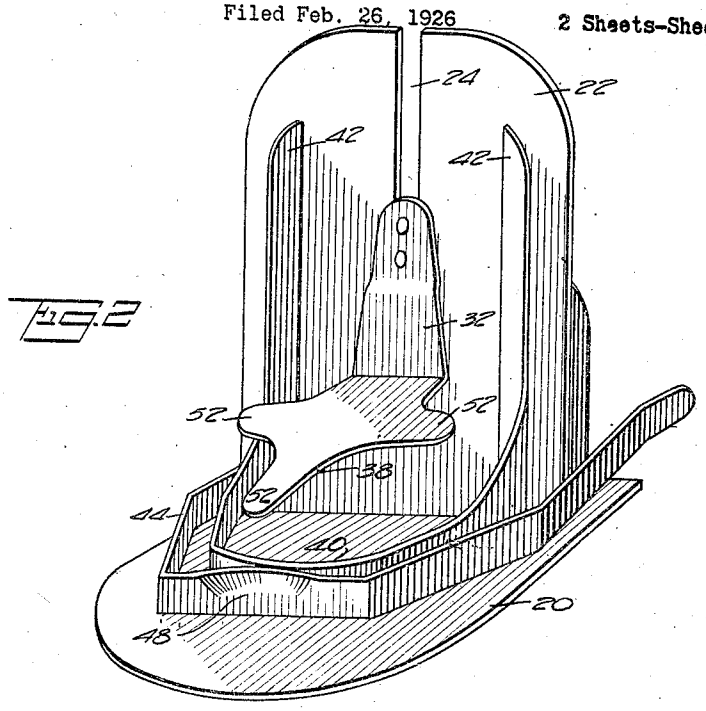
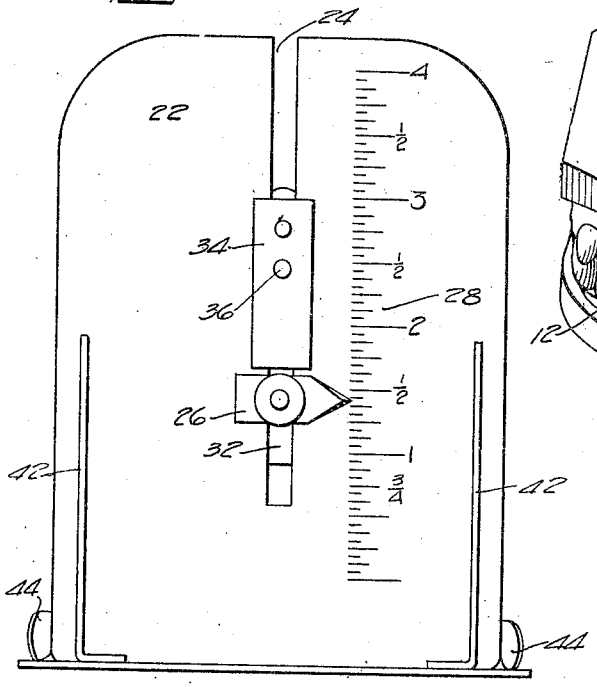


FIG. 2.

FIG. 3.



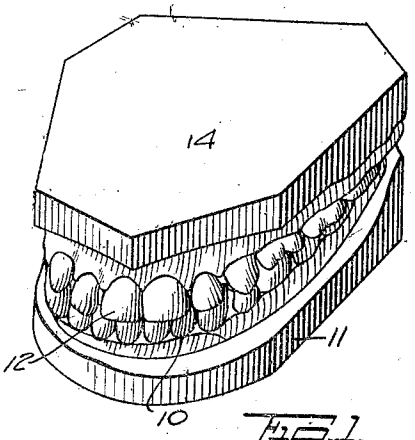


FIG. 1.

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2 Sheets-Sheet 2

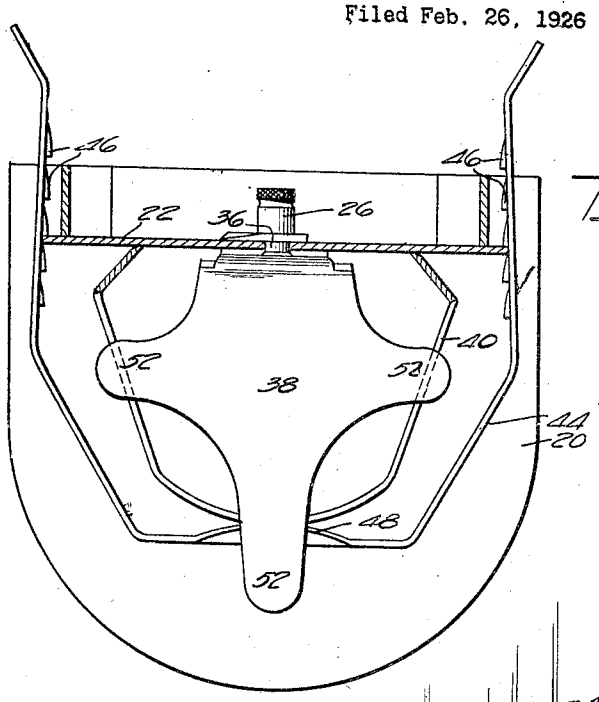


FIG. 4.

FIG. 5.

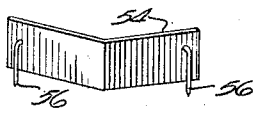


FIG. 6.

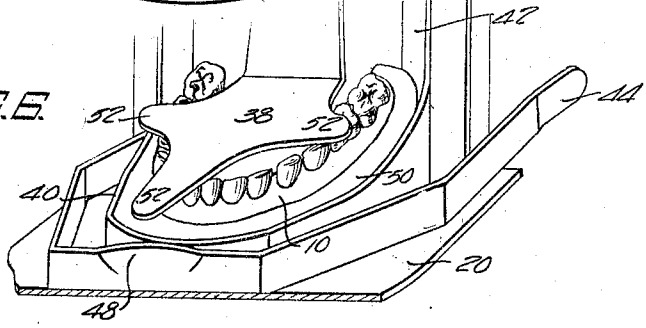
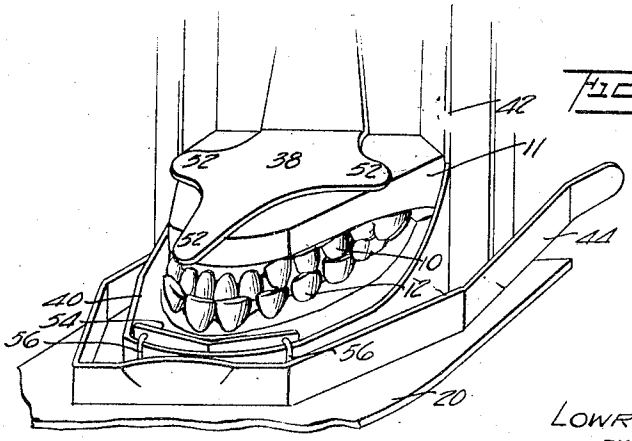


FIG. 7.



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UNITED STATES PATENT OFFICE.

LOWRIE J. PORTER, OF NEW YORK, N. Y.

MOLD.

Application filed February 26, 1926. Serial No. 90,721.

This invention relates to improvements in or connected with molds, more particularly those intended for use in the dental profession in connection with the production of orthodontic record models.

As is well known, the anatomical portions of such models are usually provided, for convenience in storing and handling, with art portions, and heretofore considerable time and labor have been expended in so doing, the major portion of the work at least having heretofore been carried out by hand, particularly that of trimming whereby that art portion attached to the lower anatomical specimen is finished to match that of the upper anatomical specimen and vice versa.

Now the primary object of the present invention is to provide means whereby practically all of the work is accomplished by a simple molding operation, thus reducing the time and labor heretofore expended thereon, reducing the cost of production, and resulting in the obtainment of accurately defined and matching lower and upper art portions for the lower and upper anatomical portions of the record model.

Further objects of the invention will appear from the following description in which reference will be made to the accompanying drawings, which illustrate the preferred embodiment thereof.

In the drawings:—

Figure 1 is a perspective view of an orthodontic record model produced according to the invention, the same comprising, it is to be noted, upper and lower anatomical portions and corresponding art portions cast integral therewith;

Fig. 2 is a perspective view of a mold used for the production of the record model shown in Fig. 1;

Fig. 3 is a rear view of said mold;

Fig. 4 is a plan view, partly in section, of said mold;

Fig. 5 is a side view of a detail of construction;

Fig. 6 is a perspective view of part of the mold illustrating a step in the process of producing a record model; and,

Fig. 7 is a similar view to Fig. 6 showing a further step in such process.

Referring first of all more particularly to Figure 1, 10 indicates the lower anatomical portion of an orthodontic record model, 11 the art portion cast integral therewith, 12 the upper anatomical portion and 14 the art portion thereof.

Now the mold for providing the anatomical portions 10 and 12 with the art portions 11 and 14 respectively comprises, as shown in the remaining figures of the drawings, a base plate 20, which may be of any desirable shape, to which is attached an upright member or back 22 provided with a slot 24 in which is adapted to work an adjustable stop 26 (see Fig. 3) cooperating with a scale 28 marked or affixed to the rear face of the back 22. Said slot is also adapted to receive and guide a sliding plane serving the purpose hereinafter described, and comprising a front vertically-disposed member 32 adapted to move over the front face of the back 22, a second vertically-disposed member 34 adapted to work over the rear face of said back and spaced from the member 32 by pins 36 or their equivalent, and a horizontally disposed member or component 38 integral with the said member 32.

Adapted to rest on the base plate 20 with its inner ends in contact with the front face of the back 22 is an art portion shaping or defining member 40 adapted to receive and confine the plastic material used to form the art portions for the anatomical specimens. Said member 40, it is to be noted, is provided at opposite sides with vertically-extending wings or guides 42, the purpose of which will be hereinafter explained.

To retain the shaping member 40 firmly in position with relation to the base 20 and back 22 of the mold there is provided a spring clamping member 44 having a plurality of inturned lugs or projections 46 adapted to engage the side edges of the back 22 and lock the member 40 in place, such locking being facilitated by providing the front wall of clamping member 44 with an indented portion 48 which contacts with the shaping-member 40 and presses it against the back 22 of the mold.

The use of the mold for the production of orthodontic record models may be described as follows:—

The particular pair of anatomical specimens (lower and upper) which are to be provided with art portions having been selected, the height of one of them is measured and to this measurement is added the desired height of the art portion to be cast integral therewith. Suppose, for example, the height

of the said anatomical specimen proves to be ¾ in. and it is desired to provide it with an art portion of ¼ in., then the stop 26 on the back 22 of the mold is adjusted and set at the mark on the scale 28 giving the sum of such figures, namely, 1 in. The space defined by the member 40 and said back 22 is then filled with plastic material 50 (see Fig. 6) and the anatomical specimen (let us say for convenience that it is the lower specimen 10 of Fig. 1) is centrally disposed thereon. The sliding plane is next inserted into the slop 24 and moved in a downward direction until the three lateral extensions 52 of its horizontal component 38 contact with the upper edges of the teeth of said specimen 10. Pressure is then exerted on said component to gradually force the specimen 10 into the plastic material 50 and this pressure is continued until the further downward movement of the plane is arrested by the stop 26, which means of course that the height from the upper edge of the anatomical specimen 10 to the bottom of the now integral art base 11 will measure the predetermined distance of 1 in. The sliding plane can then be removed from the slot 24.

After the plastic material has hardened, the clamping member 44 and the shape-defining member 40 are removed thus completing the first (lower) half of the desired record model.

The upper anatomical specimen 12 has next to be furnished with its art portion 14. To accomplish this it is placed in occlusion with the completed lower half of the record model and the distance from the lower edge of the art portion 11 to the upper edge of said specimen 12 is measured. To the measurement so obtained is added the width of the desired upper art portion 14 and the stop 26 is then set at the total distance resulting. The shaping member 40 and the clamping member 44 are then resecured in position on the base 20, the space defined by the said member 40 and the back 22 of the mold is filled with plastic material as before and the upper anatomical specimen 12 to which an art portion is now to be attached is placed thereon, with the already completed lower anatomical specimen 10 and integral art portion 11 thereabove and in occlusion therewith as will be clear from Fig. 7. The sliding plane is now inserted in the slot 24 and moved down until its horizontal component 38 contacts with the now upper surface of the lower art portion 11. Pressure is then exerted on the component 38, thus forcing the specimen 12 down into the plastic material therebeneath, and this until the further downward movement of the plane is arrested by its contact with the stop 26. It will be seen that the verticallly-disposed wings 42 serve as guides for the art portion 11 in its downward movement.

The plastic material is allowed to dry when the completed record model can be removed from the mold.

It will be realized that the art portions with which the upper and lower anatomical specimens 10 and 12 are respectively provided by the operations hereinbefore mentioned are an exact match in all respects, this in turn resulting in the production of a balanced and artistic record model. The shape of such art portions can, of course, be varied within wide limits; that shown is very popular in the orthodontic profession today and has accordingly been selected as a convenient example only. Consequently the defining member 40 is capable of variation within the spirit and scope of the invention as is also the clamping member 44.

It is of course desirable to vary the size of the art portions according to the size of the particular anatomical specimens; this can conveniently be taken care of by providing art portion defining or shaping members of different sizes. To accommodate such different-sized members the clamping member 44 is therefore preferably provided with a plurality of locking members 46 so that each shaping member can be held firmly in place during the molding operation.

It will furthermore be noted that the shape of the front of the lower art portion 11 differs from that of the upper portion 14, the former being rounded and the latter pointed (see Fig. 1). As the two art portions are cast in the same mold, it is of course necessary where it is desired to obtain this difference in contour, to introduce into the mold a shape differentiating member prior to the casting one of said art portions. The defining member 40 shown in the drawings is provided with a rounded front wall; this can therefore be utilized for the formation of the lower art portion 11. For the formation of the upper portion 14 the member 54 shown in Fig. 5 should therefore be attached to the inside of the front wall of the member 40 as shown in Fig. 7, its pins 56 retaining it in position as will be understood without further description.

As hereinbefore indicated, the mold herein described although primarily intended for the production of orthodontic record models can nevertheless be used for the molding of articles of various kinds, and it is therefore to be understood that the preceding description is to be regarded as explanatory, and not limitative as to the various industries to which the invention is capable of application.

Having described my invention, what I claim is:

1. Molding apparatus comprising, in combination, a base, a back projecting upwardly

therefrom, means for determining the contour of the article to be molded, a sliding plane carried by said back, and means for limiting the movement of said sliding plane to produce an article of a predetermined height.

2. Molding apparatus comprising a base, a back projecting upwardly therefrom, a member adapted to define the contour of the article to be molded carried by said base, means for reducing said article to the desired height carried by said back, and means for limiting the movement of said height-reducing means.

3. Molding apparatus comprising a base, a back projecting upwardly therefrom, a spring clamping member, a member adapted to define the contour of the article to be molded detachably held in place within said clamping member, a sliding plane carried by said back, a horizontally-disposed component forming a part of said slide and adapted to exert pressure on the article being molded, and means for limiting the downward movement of said slide.

4. Molding apparatus comprising a base, a back projecting upwardly therefrom, a spring member adapted to define the contour of the article to be molded and adapted to be clamped to said back, guide wings extending upwardly from said member, a sliding plane carried by said back, and adjustable means for limiting the movement of said plane to produce an article of a predetermined height.

5. Molding apparatus comprising a base, a back having a slot projecting upwardly therefrom, a clamping member, a member for defining the shape of the article to be molded adapted to be detachably secured in place by said clamping member, guiding wings projecting upwardly from said defining member, a sliding plane adapted to be moved in said slot to bring pressure to bear on the article being molded, and means for limiting the downward movement of said plane.

6. Molding apparatus comprising a horizontal base, a back having a slot extending vertically upward from said base, a clamping member, a mold defining member adapted to be removably secured in position on said base and against said back by said clamping member, a sliding plane adapted to be moved in said slot to reduce the article being molded to a predetermined height, and an adjustable stop adapted to be positioned in said slot to limit the downward movement of said plane.

7. Molding apparatus more particularly intended for use in providing the anatomical portions of orthodontic record models with art portions comprising a base, a back projecting upwardly therefrom, a measuring scale associated with said back, a clamping member adapted to rest on said base and engage said back, a member for defining the contour of said art portions removably held in position by and within said clamping member, a sliding plane adapted to be moved down said back to press an anatomical portion into the plastic material from which its art portion is to be formed, and an adjustable stop carried by said back and adapted to cooperate with said scale to produce orthodontic record models of a predetermined height.

8. Molding apparatus more particularly intended for use in providing the anatomical portions of orthodontic record models with art portions comprising a base, a back having a slot extending vertically upward therefrom, a measuring scale associated with said back, an adjustable stop positioned in said slot and adapted to cooperate with said scale, a spring clamping member adapted to engage said back, a plurality of inturned lugs on said member for effecting said engagement, a member for controlling the contour of the art portion removably secured in place by said clamping member, and a plane adapted to slide in said slot for depressing an anatomical portion into the plastic material forming its art portion to provide a mounted anatomical specimen of a given height predetermined by the setting of the adjustable stop.

9. Molding apparatus more particularly intended for use in providing the anatomical portions of orthodontic record models with art portions comprising a base, a back projecting upwardly therefrom, a measuring scale associated with said back, a clamping member adapted to rest on said base and engage said back, a member for defining the contour of said art portions removably held in position by and within said clamping member, a sliding plane adapted to be moved down said back to press an anatomical portion into the plastic material from which its art portion is to be formed, an adjustable stop carried by said back and adapted to cooperate with said scale to produce orthodontic record models of a predetermined height, and means carried by said contour defining member for guiding the art portion of a mounted anatomical specimen in line with the art portion being formed on a second anatomical specimen placed in occlusion with said first-mentioned specimen.

10. A method of providing the lower and upper anatomical portions of orthodontic record models with art portions which consists in providing one of said anatomical portions with its art portion in a mold, removing said mounted anatomical portion from the mold, replacing it in said mold in an inverted position and in occlusion with the other anatomical portion and maintaining such occlusion during the time that said

other anatomical portion is being provided with its art portion.

11. A method of providing the lower and upper anatomical portions of orthodontic record models with art portions which consists in providing one of said anatomical portions with an art portion of predetermined height in a mold, removing the mounted anatomical portion from the mold, replacing it in said mold in an inverted position and in occlusion with the other anatomical portion and maintaining such occlusion during the time that said other anatomical portion is being provided with its art portion, said first mentioned mounted anatomical portion serving to provide said other anatomical portion with an art portion of predetermined height.

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

LOWRIE J. PORTER.