Feb. 11, 1936. R. LAMBERT 2,030,524

ORTHODONTIA MOLDING DEVICE

Filed Oct. 12, 1933

Fig. 1.

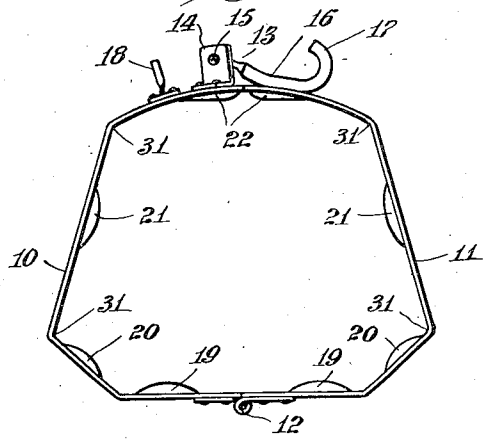


Fig. 2.

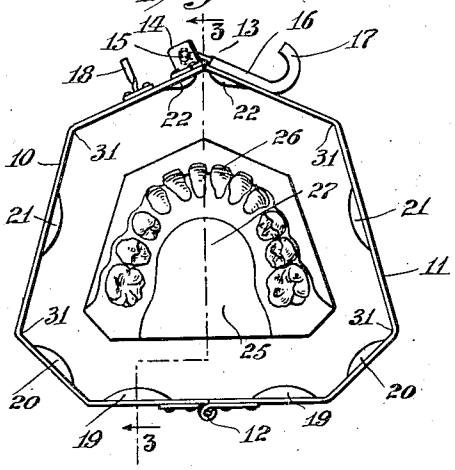


Fig. 3.

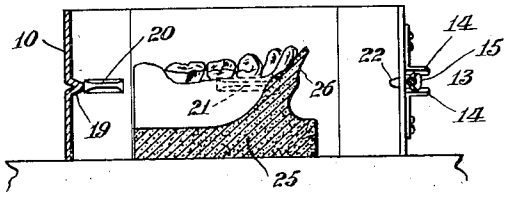


Fig. 4.

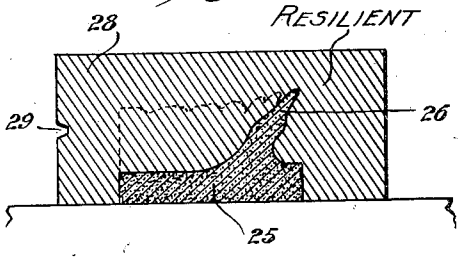


Fig. 5.

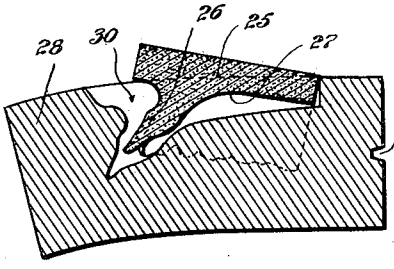


Fig. 6.

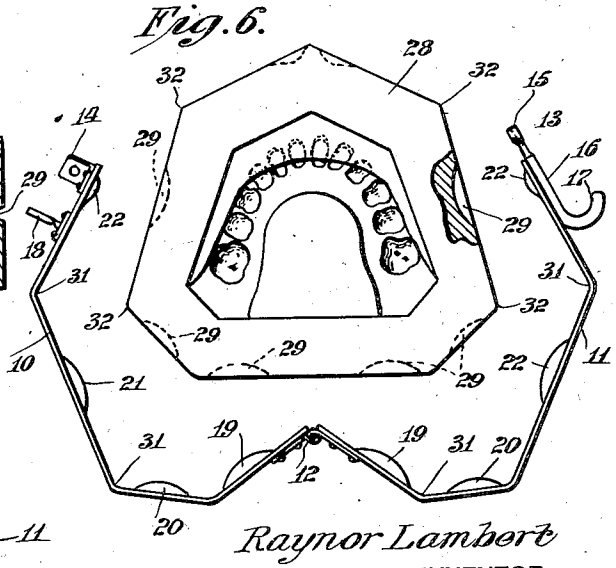
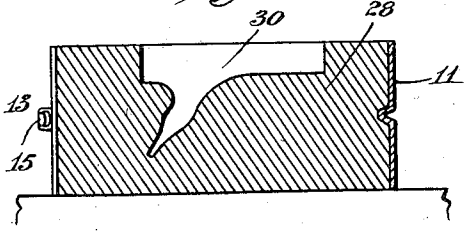


Fig. 7.



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ORTHODONTIA MOLDING DEVICE

Raynor Lambert, Brooklyn, N. Y.

Application October 12, 1933, Serial No. 693,253

3 Claims. (Cl. 18—34.1)

My invention relates to devices or apparatus to facilitate the duplication of models used in orthodontia.

The main object is to provide simple, convenient and reliable means to facilitate the duplication of such models.

The standard form of model consists of a base plate usually of plaster and the duplication of the parts of the teeth and adjacent anatomy commonly formed of harder material called stone. On account of the shape and arrangement of teeth commonly found in this type of work it is very difficult to duplicate the models. It is therefore customary to form molds of a gelatinous or rubbery-like resilient compound which is fluid when heated and has a stiff jelly-like consistency when cold. On account of the character of this gelatinous mold it is necessary to handle the mold very carefully and even with the most careful handling the mold may become deformed or broken.

I have therefore sought to provide a frame for casting the mold which frame may in turn be employed to hold the mold when casting the duplicate of the model.

For this purpose I provide a frame which is essentially octagonal and formed of metal which is polished on its inner surface.

This frame is formed of two parts and provided with means for securing the two parts together in a definite relation. The inner walls are provided with projections so arranged as to interlock with the gelatinous mold and yet permit the separation and attachment without breaking the mold.

Figs. 1 and 2 show the frames for the models of upper and lower teeth respectively, and

Fig. 2 shows the original model in the position it would occupy in the frame when pouring the composition for the mold.

Fig. 3 is a sectional view on the plane of the line 3—3 of Fig. 2.

Fig. 4 is a sectional view showing the model with the gelatinous mold cast upon it but with the frame removed.

Fig. 5 is a sectional view showing the mold distorted and the model being withdrawn.

Fig. 6 is a plan view of the mold with the frame opened out and about to be reapplied to it.

Fig. 7 is a sectional view showing the frame applied to the mold ready for the pouring of the plaster for making the duplicate of the model.

The frame is formed of metal with the two parts 10 and 11 which are duplicates of each other and adapted to be secured together for instance by a hinge pin 12 and a catch 13 so as to form a space within of predetermined definite size and of approximately the shape of a standard model but slightly larger. The inner surface walls of the frame members are polished and are preferably at right angles to the planes of the upper and lower surfaces of the frame members.

The catch 13 in the form shown consists of two spring clips 14 having recesses or perforations to receive the ball shaped member 15. The spring clips 14 are carried by one end of the frame member 10 and the ball member of the catch is carried by the adjacent end of the other frame member 11. This ball member is preferably formed as an extension of the arm 16 which extends around the end of the member 11 into position to snap in between the clips 14 so as to yieldingly but tightly hold the parts together. To facilitate the separation or release of the catch members I prefer to provide finger pieces such as 17 and 18 adjacent the ends of the frame members opposite the hinge pin 12.

The inside walls of the frame are provided with a number of inwardly projecting lugs such as 19, 20, 21 and 22 which are preferably wedge-shaped in section as shown in Fig. 3 and so shaped that they may be swung into and out of engagement with the gelatinous mold without tearing or breaking it.

The original model consists of the base plate 25 with the projecting portions 26 which represent the teeth and gums. A recess 27 is provided within the periphery of the teeth models.

To form the mold the parts of the frame are connected together as shown in Fig. 2 and the frame is placed on a smooth support as shown in Fig. 3. The original model is then centered within the frame leaving a substantial space all around the model. The gelatinous composition in fluid form is then poured into the frame around and over the model and allowed to harden and form a mold body 28. The parts of the frame are then separated so that the mold and the model may be removed. The imprint of the lugs in the mold leaves the recesses 29.

The original model 25 is then carefully extracted by bending and twisting and loosening the resilient mold so as to leave the recess 30 which constitutes the impression from the original model. When the gelatinous mold is released it reassumes its form as originally cast upon the original model.

It will be noted that the angular arrangement

of the sides of the frame forms interior corners **31** and that the mold as cast has corresponding angular projections **32** which exactly fit these corners.

When the original model has been removed from the mold the mold is again placed on the table or smooth plate of glass or the like in the position as shown in Fig. 6. The opened out frame is then laid upon the plate or table and the parts of the frame pressed together about the mold body.

The angular corners **31** are thus made to fit the corresponding corners **32** of the gelatinous mold and the lugs such as **21** are fitted back into the corresponding recesses **29**. It will be appreciated that by reason of the gelatinous character of the mold the repositioning of the frame about the mold must be done very carefully so that the mold will not be distorted in any way, as distortion would of course change the shape of the recess **30**.

After the frame has been reapplied to the mold as shown in Fig. 7 the plastic self-hardening composition is poured into the mold bit by bit and worked down into the smallest cavities by shaking and jarring the frame with the contained mold. The interlocking of the lugs **21**, etc., with the material of the mold prevents the mold from being displaced or loosened or distorted in this shaking and settling action.

It will be seen from the foregoing that the lugs **21**, etc., should be smooth and wedge shaped in section as well as in plan so that they will provide a maximum holding facility and at the same time produce a minimum likelihood of fracture or cracking of the mold body.

These lugs may be either integrally formed with the material of the frame or soldered, riveted or otherwise secured thereto.

After the cavity **30** in the mold has been filled with the plastic composition, the composition is allowed to harden so as to form the desired duplicate of the original model. The parts of the frame are then separated and the mold with the newly cast model removed. The mold is then removed from the model in the same manner as the original model was removed from the mold although of course if the mold is not to be used again it is not necessary to exercise the same degree of care in separating the mold from the duplicated model.

While it is possible to form the frame of sheet metal it should be quite heavy and substantially inflexible so that it will not become distorted in use and so that there is little likelihood of any pressure being brought to bear upon the gelatinous mold as would be possible if the frame were resilient or of variable size.

I have particularly shown and described the invention as applied to the formation of a duplicate model of an upper set of teeth. It will be understood that the frame shown in Fig. 1 is intended for the duplication of the models of lower teeth, the slight difference in form corresponding with the more or less standardized forms of models used in orthodontia.

The sides of the frame are preferably of uniform height and the lugs are located in the central plane so that the frame may be inverted or reversed with respect to the table and with respect to the mold itself. The frame should be enough larger than the model to provide adequate side-wall-producing space for the gelatinous mold and yet not waste material which is rather expensive.

I claim:

1. A frame for duplicating dental models comprising rigid parts fixedly hinged together and having walls of uniform height to enclose a model and leave space around the sides and over the teeth of the model for the reception of a gelatinous mold-forming substance, said frame having integral means for repositioning the mold after the model has been removed and said walls having a smooth inner surface, and integral inwardly projecting wedge shaped lugs on the inner surfaces of the walls adapted to hold the solidified mold when plaster is being poured and shaken in.

2. A frame for forming dental molds from elastic compositions comprising two angular parts fixedly hinged together at one end of each and having a spring catch detachably connecting the opposite free ends, a finger piece connected to each free end adjacent the catch, said parts having smooth inner walls of uniform height open at the top and bottom and reversible and having integrally formed and inwardly projecting wedge shaped lugs arranged in the central plane of the frame and parallel with the top and bottom.

3. A frame for duplicating dental models comprising two rigid parts fixedly hinged together to enclose a model and leave space of substantially uniform width for the reception of a gelatinous mold-forming substance, said frame providing corners for repositioning the mold after the model has been removed, said parts having smooth inner surfaces and inwardly projecting integral lugs of wedge shape on said inner surfaces and between the corners adapted to hold the solidified mold when plaster is being poured and shaken in.

RAYNOR LAMBERT.