June 11, 1963 R. M. MILLER 3,092,909

METHOD FOR RELEASABLY MOUNTING DENTAL MODELS IN PLASTER OF PARIS ON DENTAL ARTICULATORS

Filed Feb. 14, 1961 3 Sheets-Sheet 1

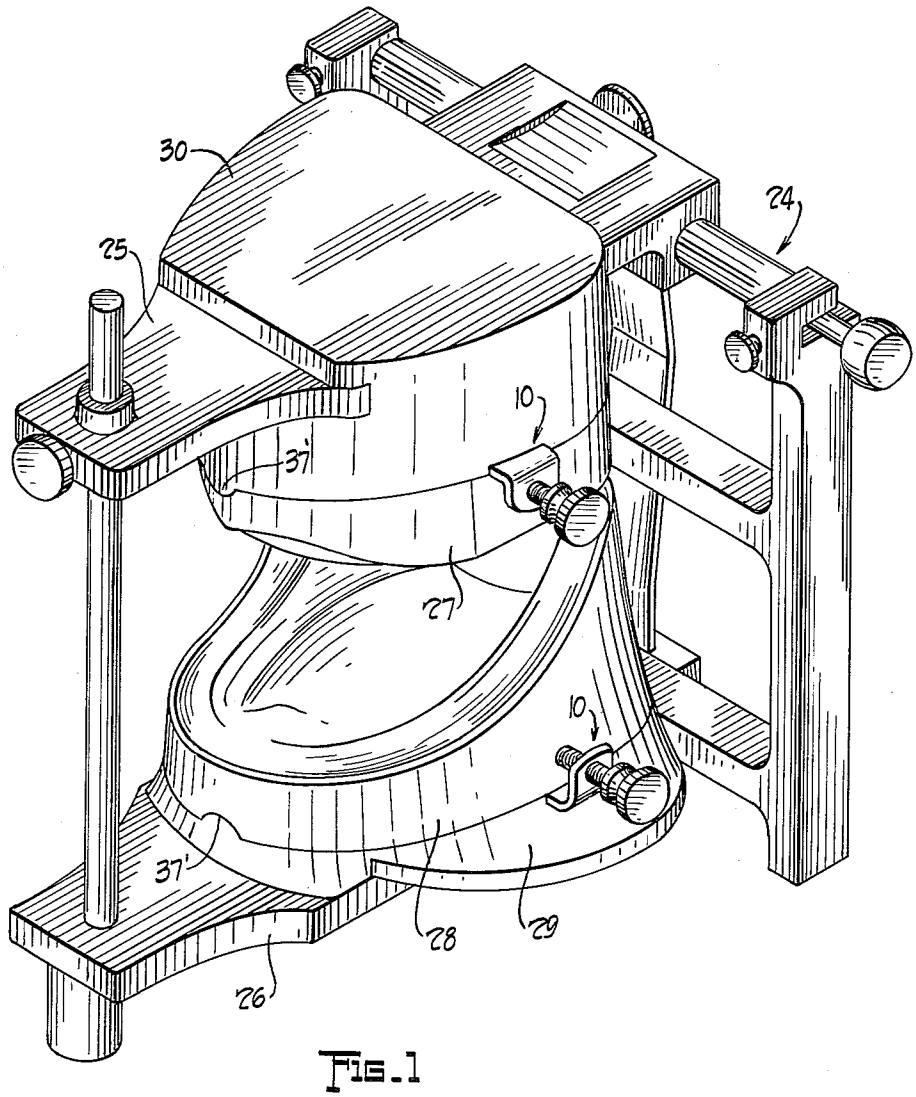


FIG. 1

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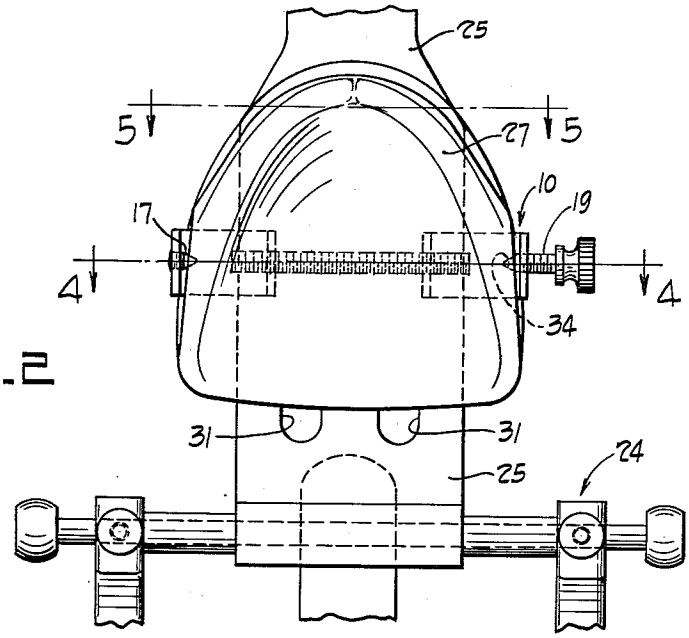


Fig. 2

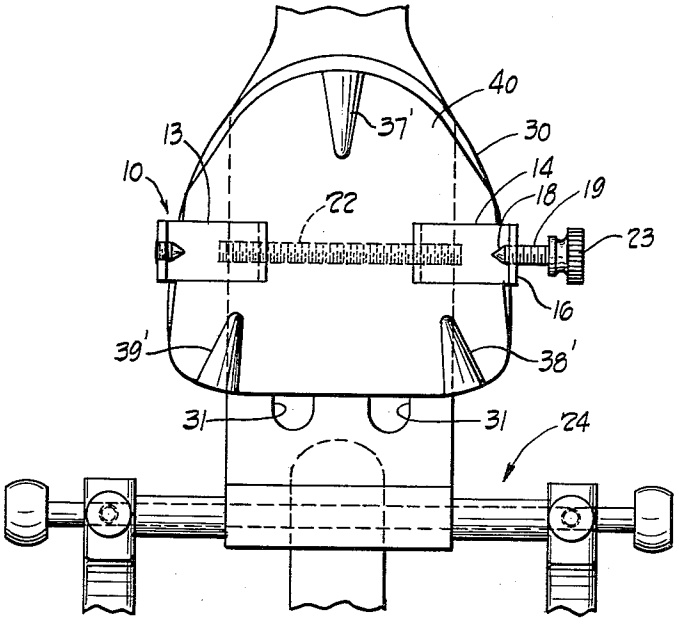


Fig. 3

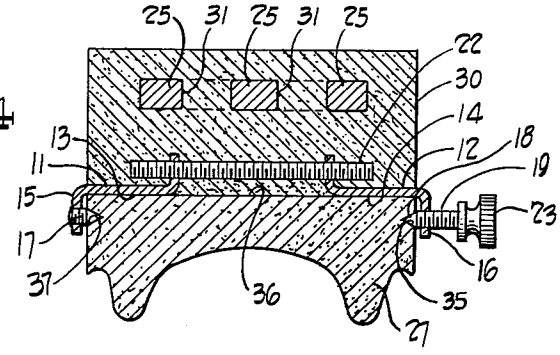
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Fig. 4



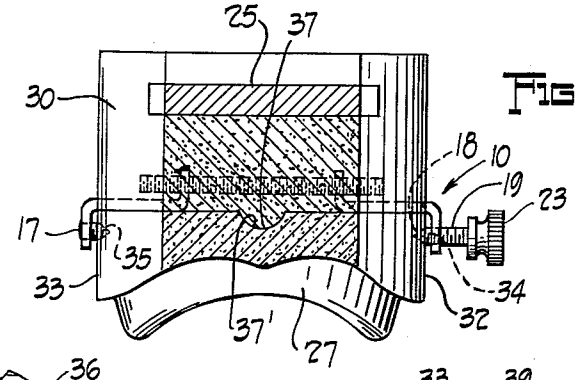


Fig. 5

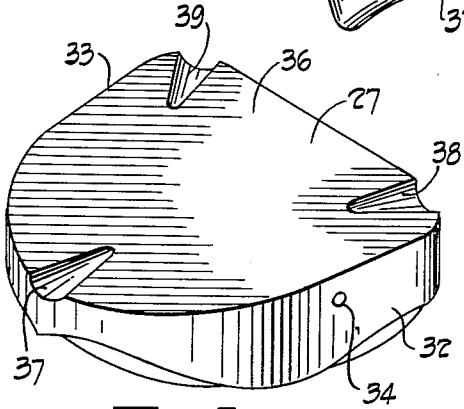


Fig. 6

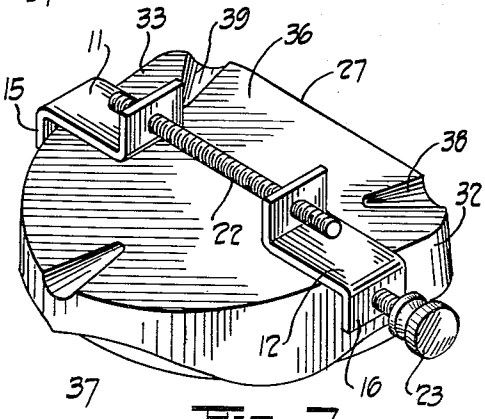


Fig. 7

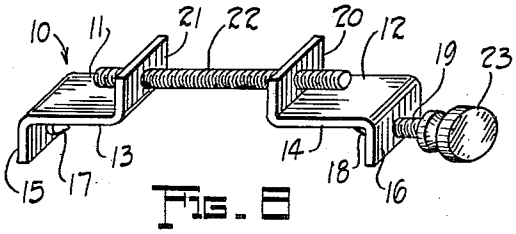


Fig. 8

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3,092,909

METHOD FOR RELEASABLY MOUNTING DENTAL MODELS IN PLASTER OF PARIS ON DENTAL ARTICULATORS

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1 Claim. (Cl. 32—32)

This invention relates to clamping devices, and particularly to means for releasably anchoring jaw models to the plaster mounts of dental articulators.

Conducive to a better understanding of this invention, it may be well to point out that it is common practice in dental laboratories to mount jaw models used in preparing artificial dentures on various types of articulators by means of plaster of Paris or other adhesive materials, thus producing a more or less permanent bond with the articulator.

In case of necessary adjustment, or where steps of construction require removal of the models, the operator is compelled to either break the model loose from the articulator or else dismount the part of the articulator to which the model plaster mount is attached.

It has always been impossible to remove a model from a plaster mount and then re-position and re-attach the model to its original position without using an adhesive, or re-mounting with new plaster. Furthermore, such adhesive joints are likely to fail under the strain of grinding or setting up the dentures so that the model may be accidentally dropped, or must be hand-held in proper position on the articulator, or be re-mounted repeatedly, which is both time consuming and aggravating.

There have been methods developed to effect this re-mounting operation by inserting a male or female part of a mounting device into the model while it is being poured, but most dentists send jaw models, which have had their final set, to dental laboratories without such inserts.

Again, there are methods whereby the entire segment, model and plaster mounting, can be removed from the bows of the articulator but this makes a unit that is ordinarily too large and bulky to fit equipment used for operations for which the model must be separated from the articulator.

The primary object of this invention, therefore, is to provide a clamping device whereby it is possible to anchor a master cast, or jaw model, on the plaster mount of an articulator in such a manner that it can be removed and later securely replaced in its original position on said plaster mount without the use of any adhesive.

Another object is to provide a clamping device of the type stated that releasably joins the model to the plaster mount through mechanical means only.

Further objects are to provide a clamping device that makes it convenient to attach a model to an articulator with plaster of Paris, which creates a clean parting line between the model and the mounting plastic, which provides an accurate seat for the model, and which requires only a single screw adjustment for the removal and replacement of the model on the articulator after the various operations that require separation are completed.

These and other objects of the invention will become apparent from a reading of the following specification and claims, together with the accompanying drawings wherein like parts are referred to and indicated by like reference numerals, and wherein:

FIGURE 1 is a perspective view of a dental articulator showing upper and lower jaw models releasably mounted thereon by means of the clamping device that is the subject of this invention;

FIGURE 2 is a front elevation of the upper jaw model in its open position on the articulator showing it clamped to the plaster mount thereof;

FIGURE 3 is a view similar to that of FIGURE 2 but showing the plaster base with the upper jaw model removed;

FIGURE 4 is a sectional view of the mounted model taken along the line and in the direction of the arrows 4—4 of FIGURE 2;

FIGURE 5 is a view, partly in section, taken along the line and in the direction of the arrows 5—5 of FIGURE 2;

FIGURE 6 is a perspective view of the upper jaw model as it appears, prepared to receive the clamping device;

FIGURE 7 is a perspective view of the unmounted upper jaw model with the clamping device attached thereto; and

FIGURE 8 is a perspective view of the unmounted clamping device.

Referring more particularly to the drawings, there is seen in FIGURE 1 a conventional dental articulator broadly indicated by reference numeral **24** having upper and lower bow arms **25** and **26**, which support upper and lower jaw models **27** and **28** through clamping devices that are the subject of this invention, broadly indicated by reference numeral **10**.

By referring to FIGURE 8, it will be seen that the clamp **10** comprises two jaws **11** and **12** adjustably joined together by a threaded tie-rod **22** which engages threaded bores through upstanding flanges **20** and **21** on the jaws **12** and **11**, respectively. Each jaw **11** and **12** has a terminal ear **15** and **16**, respectively, extending downward and perpendicular to the lower faces **13** and **14** of their respective jaws to form a seat for the hereinafter described model or master cast.

A pointed stud **17** is mounted on the inside face of the ear **15** and a pointed clamping screw **19** is threadedly mounted through ear **16** with its pointed end **18** in alignment with the stud **17**. Reference numeral **23** indicates a knurled head on the screw **19**. The jaws **11** and **12** can be positioned lengthwise of the threaded rod **22** at adjusted distances apart, to adapt the clamp **10** for use with dental models **27** and **28** of different width.

While both upper and lower jaw models **27** and **28** are involved in every case, only the manner of releasably anchoring the upper jaw model **27** to the articulator upper arm **25** will be described hereafter, since the same procedure is employed to anchor the lower jaw model **28** to the lower articulator arm or base **26**.

To prepare a typical upper jaw model for releasable attachment to the articular arm **25** through a plaster of Paris mount **30**, with my clamping device **10**, the following procedure is followed.

The sides of the model **27** are contoured and the base reduced to the thickness which will accommodate a duplicating or denture flask with a model grinder.

Flat areas **32** and **33** are ground on each side of the model **27** as seen in FIGURE 6. Three round locating grooves **37**, **38** and **39** are ground in the base **36** of the model **27**. The clamping device **10** is positioned crosswise of the model base **36**, as seen in FIGURE 7, with its ears **15** and **16** extending substantially parallel to the flat areas **32** and **33**. In this position the stud **17** is positioned against the flat **33** and the pointed end **18** of the screw **19** is positioned against the flat **32**. The screw **19** is tightened enough to cause slight penetration of the points **17** and **18** into the plaster model **27**. The clamp screw **19** is then backed off, and the clamp **10** removed from the model **27**, leaving dimple locating marks on the opposed flat areas **32** and **33**. A shallow dimple or conical socket, not over 2 millimeters deep, is then drilled at each of the marks, as indicated by reference numerals **34** and **35**. The clamp **10** is then re-applied to the model base with the

stud point 17 nested in the dimple 35 and the clamp screw point 18 nested in the dimple 34. In this position, the base 36 will seat snugly against the aligned lower faces 13 and 14 of the jaws 11 and 12. The clamp screw 19 is then re-tightened to secure the clamp 10 snugly to the model.

The upper and lower jaw models 27 and 28, with the clamping devices 10 fitted thereon, are then assembled as usual with a bite block therebetween.

The bases of the models 27 and 28 and the clamping devices 10 are lubricated with a solution of liquid soap and water so that the models will separate from the plaster mounts.

The models are then anchored to the articulator arms 25 and 26 by means of plaster of Paris, in the usual manner.

After suitable trimming and smoothing, the lower jaw model 28 is anchored on plaster mount 29 and the upper jaw model 27 is anchored on plaster mount 30, as seen in FIGURE 1.

When it is desired to remove either model from the articulator, the arm 25 is raised to take the vertical position shown in FIGURE 2. The following sequence of steps applies to the removal and replacement of either the upper or lower jaw models, but for convenience the description will be limited to the procedure relating to the upper jaw model 27 only. After the arm 25 is raised, the point 18 of the clamping screw 19 is backed out of the dimple 34. The right side of the model 27 is then pulled forward which causes the model to separate from the plaster mount 30 along a parting line in the plane of the top surface 36 of the model base and the aligned surfaces 13, and 14 of the jaw members 11 and 12, all of which had been previously lubricated with a soap solution.

FIGURE 3 shows the appearance of the plaster mount 30 immediately after the removal of the jaw model 27. The mount 30 remains locked to the arm 25 for the reason that it is interlocked with openings 31 cut in the arm 25, as is seen most clearly in FIGURE 4. The mount 30 has a flat face 40 which forms a parting plane between it and the model. The aligned faces 13 and 14 against which the model 27 had been seated are in the plane of surface 40 and form a continuation thereof. Because the tie-rod 22 is offset beyond the jaw faces 13 and 14 and therefore is entirely embedded in the plaster, as is seen in FIGURES 4 and 5, the clamping device 10 remains anchored in the mount 30 when the model 27 is removed.

Reference numerals 37', 38' and 39' indicate half round locating tongues which were formed when the plaster of the mount 30 was poured onto the horizontal surface 36 of the model base 27. These tongues mate with their respective grooves 37, 38 and 39 of the jaw model 27. To re-assemble the model 27 on the mount 30, the model is

positioned in front of the mount face 40 with its left dimple 35 in engagement with the stud point 17. The model 27 is then pivoted against the face 40 until the tongues 37', 38' and 39' are nested within the model grooves 37, 38 and 39, as seen in FIGURE 5. In this position, the dimple 34 is aligned with the point end 18 of the clamping screw 19, which is then rotated into the dimple and into a snug fit therewith. The model 27 is now in the exact position it was before removal and is securely locked in place between the conical points of the stud 17 and screw 19. Due to the conical shape of the screw point 18, the more it penetrates the dimple 34 of the model the tighter it presses it against the face 40 of the mount 30.

The so held model 27 cannot possibly fall off the mount 30, while at the same time it can be easily removed therefrom by merely backing off the screw 19.

While the device has been described as comprising two jaw elements adjustably joined through a threaded tie rod, it could take the form of a non-adjustable strap of substantially the same shape, that is, with its center position offset to provide plaster anchoring structure.

It will now be clear that there has been provided a device which accomplishes the objectives heretofore set forth.

While the invention has been disclosed in its preferred form, it is to be understood that the specific embodiment thereof as described and illustrated herein is not to be considered in a limited sense, as there may be other forms or modifications of the inventian which should also be construed to come within the scope of the appended claim.

I claim:

The method of forming a plaster-of-Paris dental articulator mount on a hardened dental cast for releasable engagement therebetween, comprising the steps of grinding the base of the cast flat, grinding a plurality of half-round locating grooves in the base face, grinding opposed flat surfaces on each side of the cast, drilling a dimple in each side face proximate the base, said dimples being aligned with each other, mounting a C clamp, having adjustable clamping points, on the cast base, cross-wise thereof between the dimples, with the clamp points releasably seated in the dimples, coating the base with a parting lubricant and then pouring a plaster-of-Paris mount over the cast base and clamp to embed the clamp in the plaster mount, leaving only its jaw points exposed.

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