Oct. 9, 1956 R. M. McMORRIS 2,765,533

DENTAL ARTICULATOR

Filed April 28, 1955

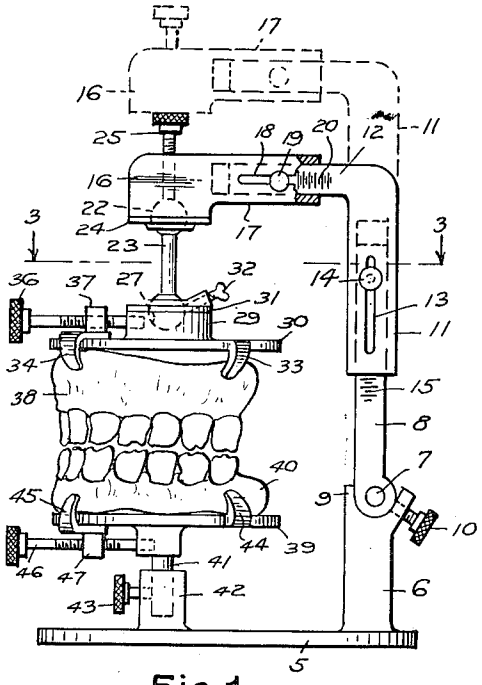


Fig. 1.

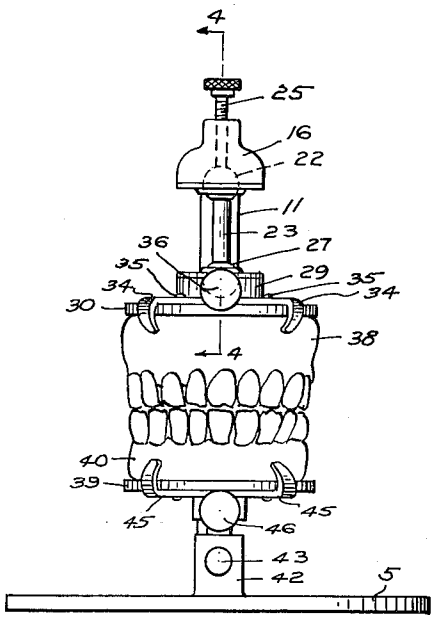


Fig. 2.

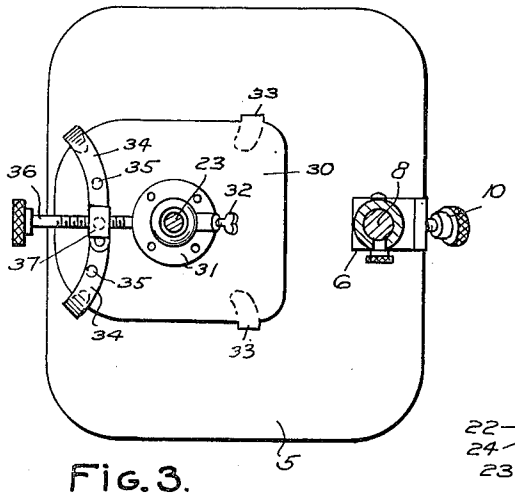


Fig. 3.

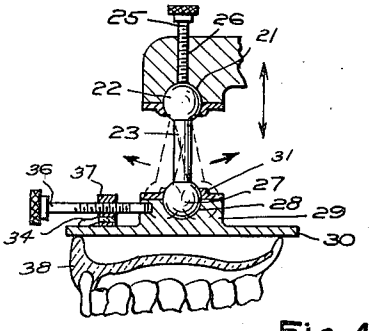


Fig. 4.

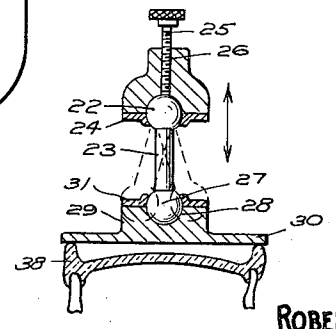


Fig. 5.

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United States Patent Office

2,765,533

Patented Oct. 9, 1956

2,765,533

DENTAL ARTICULATOR

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Application April 28, 1955, Serial No. 504,418

3 Claims. (Cl. 32—32)

This invention relates to an improvement in dental articulators.

An object of the invention is to provide a dental articulator which permits the mounting of dental models on the articulator without the use of plaster and whereby the models will be securely supported throughout the operation of the device.

A further object of the invention resides in providing an articulator whereby to permit of a simple and accurate grinding of the occlusion of self occluding dental cases where the patient has opposing natural teeth, and whereby the models of such patients can be mounted by suitable clamping devices in centric relationship upon one another, and with the device embodying novel mechanism whereby to allow the models to ride on one another in centric, lateral and protrusive movements, which provides a means of finishing occlusions in an extremely accurate manner only possible where natural teeth oppose one another.

Another object of the invention resides in a novel form of articulator that is extremely simple to adjust, has few and simple parts, is strong, durable and is extremely accurate in the grinding of dental models.

Other objects and advantages of the invention will be clearly apparent during the course of the following description, reference being had to the accompanying drawings, wherein has been illustrated a preferred form of the device and wherein like characters of reference are employed to denote like parts throughout the several figures.

In the drawings:

Figure 1 is a side elevation of an articulator, constructed in accordance with the invention and wherein the device has been adjusted to the operative position,

Figure 2 is a front elevation of the device,

Figure 3 is a horizontal section, taken substantially on line 3—3 of Figure 1,

Figure 4 is a fragmentary vertical section taken on like 4—4 of Figure 2, and

Figure 5 is a section similar to Figure 4 but at a right angle thereto.

Referring specifically to the drawings, the numeral 5 designates a base plate of any desirable shape and size. The base 5 is preferably formed of metal or other materials having adequate strength. Disposed centrally of the plate 5 and adjacent its rear edge is a preferably integral upstanding boss 6, the upper end of which is bifurcated and apertured for a hinge connection 7 of an upper bracket rod 8. The rod 8 is limited in its hinged forward movement by a lip 9 formed upon the boss 6 and is swingable rearwardly upon the hinge 7 to facilitate the mounting of the dental models, to be described. A set screw 10 serves to fix the rod 8 in a desired angular position or to fix the rod 8 in a vertical position, shown.

Shiftable in a vertical plane upon the rod 8 is a sleeve 11 provided at its upper end with a preferably cylindrical right angle extension 12. The sleeve 11 is slotted at 13 and a set screw 14 serves to fix the sleeve in adjusted

vertical position upon the rod 8 during the initial adjustment of the device. The rod 8 is preferably cailbrated in millimeters, as at 15, whereby the vertical adjustment of the sleeve 11 may be gauged in accordance with the particular models being ground. Slidable upon the extension 12 is a supporting head 16 carrying a sleeve 17 that is movable in a horizontal plane along the extension 12 and with the sleeve 17 being slotted at 18 for the reception of a set-screw 19 carried by the extension 12. The extension 12 is likewise calibrated in millimeters, as at 20, for determining the initial adjustment of the device.

The head 16 is provided with a spherical socket 21 for the reception of a ball 22 carried at the upper end of a link 23 whereby the link may swing in a universal manner. A retainer plate 24 supports the ball 22 against displacement. A set-screw 25 threaded through an opening 26 serves to clamp the ball 22 and its link 23 against movement. The link 23 at its lower end is provided with a ball 27 rotatable in a socket 28 formed within a lug 29 carried by an upper mounting plate 30. A retainer plate 31 serves to prevent displacement of the ball 27 with respect to the socket 28, while a set-screw 32 serves to fix the ball and associated plate 30 against movement with respect to the link 23. The plate 30 is provided with a pair of fixed clamping fingers 33 adjacent its rear end and an adjustable clamp embodying arms 34 is pivotally supported upon the upper surface of the plate 30, as at 35, and an adjusting screw 36, operating through a nut 37, serves to shift the arms 34 into engagement with the dental model 38. Thus, with the clamp arms 34 in the release position, the model 38 may be quickly and easily engaged upon the under side of the plate 30 with the rear portion of the model engaging the fingers 33, at which time the screw 36 is operated to cause the arms 34 to swing inwardly for clamping engagement with the forward portion of the model 38. The model will thus be securely held upon the plate 30 throughout its grinding operation without the use of plaster or similar attaching means. The inner end of the screw 36 is rotatably supported in any desirable manner within the lug 29 to permit freedom of rotation for shifting the nut 37 and associated arms 34 upon their pivots 35.

A lower plate 39 is provided to support the lower model 40. The plates 30 and 39 are preferably disposed in vertical alignment. The plate 39 is rotatably supported upon the base 5 through the medium of a cylindrical pin 41 rotatable in an upstanding boss 42, preferably formed integral with the base 5. A set-screw 43 serves to clamp the plate 39 in adjusted horizontal position. The plate 39 is provided with a pair of rearwardly disposed clamping fingers 44 for contacting engagement with the rear portion of the model 40, while adjustable clamping arms 45, corresponding to the arms 34, are pivotally supported upon the under side of the plate 39 and are adjustable toward and from the forward portion of the model 40 through the medium of an adjusting screw 46 operating through a nut 47 that is connected with the arms 45 in a manner illustrated with respect to the arms 34. It will thus be apparent that both the upper and lower models may be quickly and easily rigidly mounted upon the supporting plates 30 and 39 with a minimum of effort and the clamping devices serve to retain such models in their fixed position throughout the operation of the articulator.

The use of the device is as follows:

Assuming that occluding models have been prepared, the operator loosens the screw 10 and swings the arm 8 and associated sleeve 11, sleeve 17, head 16 and associated plate 30 rearwardly. Prior to such shifting, the screw 14 has been loosened and the sleeve 11 and associated mechanism shifted upwardly to the dotted line position, after which the screw 14 is again tightened. Screws 25

and 32 may likewise be tightened and with the arm swung rearwardly the operator proceeds to first clamp the lower model 40 upon the plate 39, after which the model 38 is clamped upon the plate 30. The arm 8 is then swung forwardly to its maximum position and fixed in such a position by the screw 10. The screw 14 and the screw 19 are then loosened and the sleeve 11 is shifted downwardly until the models are in engagement with each other. The head 16 and its associated sleeve 17 is then shifted forwardly or rearwardly until the teeth of the model are in their proper occluding position. Now, with the models in proper alignment, the operator proceeds to loosen the screw 14, the screw 25 and the screw 32. It should, however, be pointed out that the lower plate 39 and its associated model 40 are fixed against movement by the screw 43. It will now be apparent that the operator may freely shift the upper model both laterally and forwardly, as indicated by dotted lines in Figures 4 and 5. And since the screw 14 has been loosened, the teeth are permitted to ride over one another in a natural manner due to the rise and fall of the sleeve 11 upon the rod 8. The operator can thus manipulate the upper model in all normal motions natural with the chewing action of the patient. Suitable grinding mediums are employed in a conventional and well known manner for grinding the teeth in proper mating relation. The seating and grinding of the teeth are performed by the hand of the operator and effectively grinds the upper and lower self occluding models to a centric position and with a high degree of accuracy. With the articulator of this invention, it becomes extremely simple to grind inlays, crowns, fixed bridges and removable bridges where there is a self-occlusion and enables the operator to deliver them to the dentist for installation and eliminates further grinding of occlusion in the patient's mouth. The freedom of movement permitted by the rise and fall of the plate 30 and its supported model 38 through the medium of the freely sliding movement of the sleeve 11 and the freedom of movement of the link 23 and its associated balls 22 and 27 serves to accelerate the grinding of the teeth in a manner not heretofore possible with the relatively complicated articulators now in use. The arms 8 and associated mechanism may be readily swung rearwardly to permit the operator to examine the degree of grinding action and to facilitate the application of the grinding wax, etc.

It is to be understood that while a preferred form of the device has been shown and described, changes are contemplated as readily fall with the spirit of the invention as determined by the scope of the subjoined claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A dental articulator for grinding artificial teeth in models of self occluding cases, having a base, a bracket pivotally connected to the base to swing in a vertical plane, a model holding plate rotatably connected to the base to fixedly support a lower dental model, clamp means associated with the plate to detachably clamp a dental model thereon, the said bracket being adjustable vertically, a support, an upper dental model supporting plate supported from said support, said support slidable upon the bracket in a horizontal plane to dispose the upper model holding plate and its supported model in correct overlying and centric opposed relation to the model of the lower model holding plate, the said support having a forward head portion, a link having spherical ends that are connected respectively in spherical sockets formed in the head and the upper portion of the upper plate whereby to support the plate in a manner that permits its manual swinging movement both lateral and protrusive, set screws for maintaining the link and the plate in a fixed position relative to the head, a set screw for fixing the first named support in adjusted position with respect to the bracket and a set screw for fixing the bracket against vertical movement.

2. A dental articulator, for grinding artificial teeth in models of self occluding cases, having a base, a bracket of inverted L-shape and including a vertical telescopic section for vertical adjustment and a horizontal telescopic section pivotally connected to the base to swing in a vertical plane, a support adjustable upon the bracket in a horizontal plane, an upper dental model supporting plate supported from the support means for limiting the forward movement of the bracket and means to limit the readward movement of the bracket, a set screw for fixing the bracket in a position of adjustment, the horizontal telescopic section being provided with a head portion having a lower face that is recessed to form a spherical socket, the upper model holding plate provided on its upper surface with a spherical socket, a link having its opposite ends formed spherical for respective seating engagement within the sockets, retainer plates to prevent displacement of the link, a set screw carried by the head and a set screw carried by the plate of the upper holder whereby to fix the link and the associated upper model plate against movement relative to the head or to release the link to permit the plate to freely swing in a lateral or protrusive movement, the telescopic sections of the bracket being slotted and graduated with each being provided with a set screw, a model holding plate rotatably connected to the base to fixedly support a lower dental model, clamp means associated with the plate whereby to detachably clamp a dental mode thereon, the upper plate and the lower plate being disposed in overlying relation whereby dental models supported thereon may be disposed in opposed centric relation and means whereby when the teeth of the dental models are disposed in a true centric opposed relation, the vertical adjusting means of the bracket is releasable to permit a natural overriding engagement of the opposed teeth by a free rise and fall of the bracket.

3. A dental articulator for grinding artificial teeth in models of self-occluding cases, having a base, a bracket pivotally connected to the base to swing in a vertical plane, a model holding plate that is rotatably connected to the base to fixedly support a lower dental model, clamp means associated with the plate to detachably clamp a dental model thereon, means to adjust the said bracket vertically, a support adjustable upon the bracket in a horizontal plane, an upper dental model supporting plate that is supported from the said support, means between the support and the last named model supporting plate whereby the plate may be fixed with respect to the support or released to permit the plate to freely swing in a lateral and a protrusive movement, each of the model holding plates are provided with a pair of fixed clamping fingers and an adjustable clamping device to fixedly mount the dental models thereon without plaster, the upper plate and the lower plate being disposed in overlying relation whereby dental models supported thereon may be disposed in opposed centric relation, the said lower model holding plate having a depending cylindrical pin that is rotatably supported within a socket formed upon the base and a set screw for fixing the last named plate against turning movement after adjustment and means whereby, when the teeth of the dental models are disposed in a true centric opposed relation, the said vertical adjusting means of the bracket is releasable to permit a natural overriding engagement of the opposed teeth by a free rise and fall of the bracket.

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