

Feb. 23, 1954

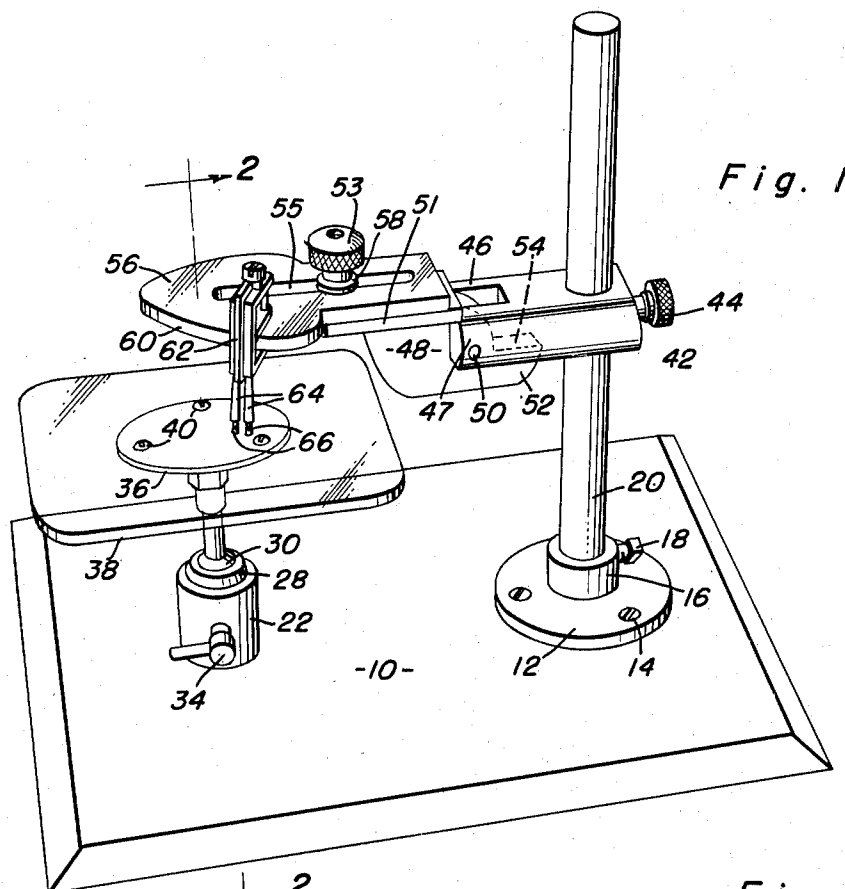
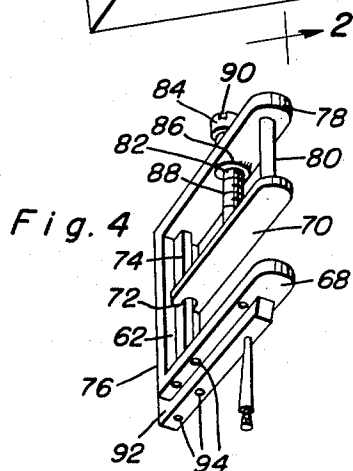
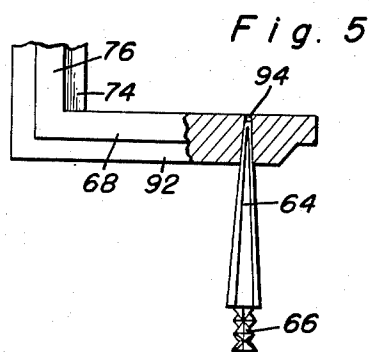
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2,669,780

PIN CENTERING AND PARALLELING INSTRUMENT

Filed Feb. 5, 1953

2 Sheets-Sheet 1



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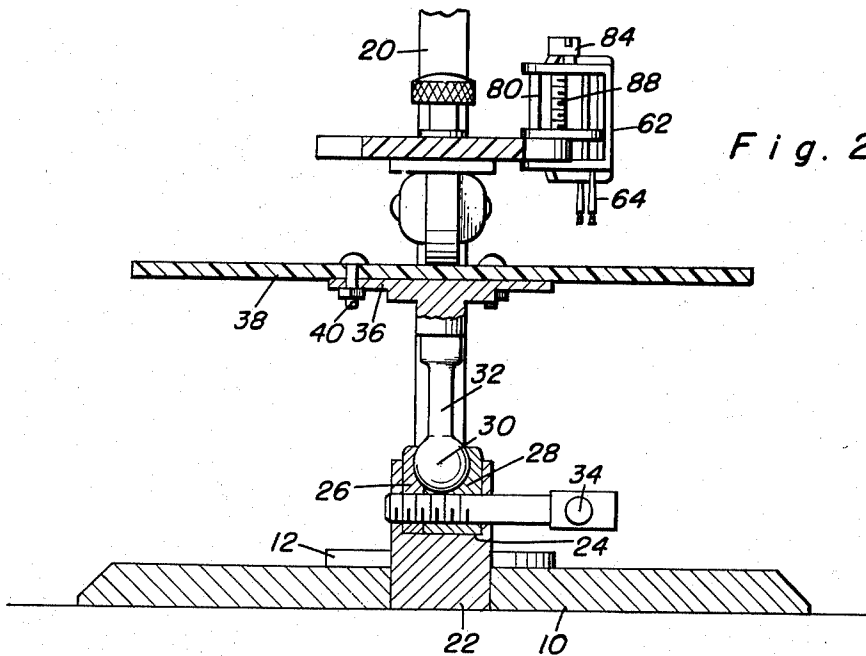
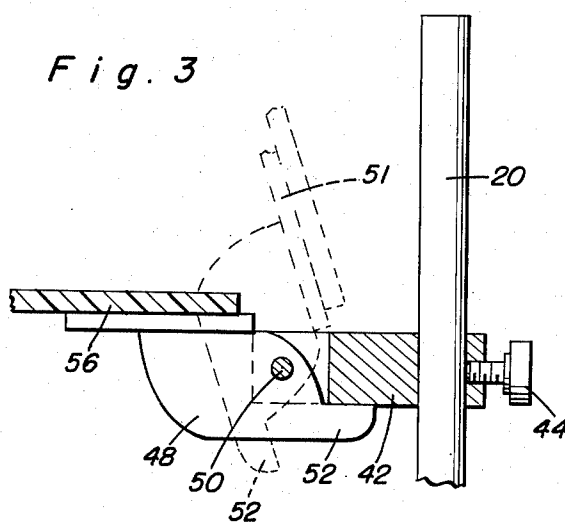
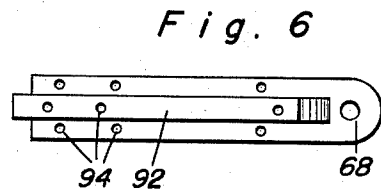
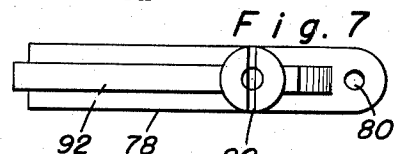
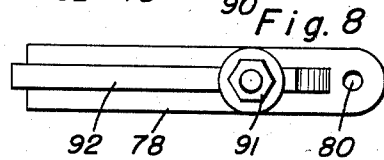
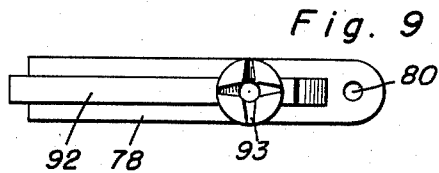
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PIN CENTERING AND PARALLELING INSTRUMENT

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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PIN CENTERING AND PARALLELING
INSTRUMENT

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9 Claims. (Cl. 32-67)

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This invention relates to restorative dentistry and more particularly to a device especially adapted for use in obtaining a hard cast or model from an elastic impression in which the individual prepared teeth in the cast can be removed for convenience in using the resealed in their exact original position in the base of the cast again resulting in a solid cast. This, then is truly a "master" cast.

Elastic impression materials such as hydrocolloid, enable the dentist to obtain a more accurate reproduction of the oral structures. The material is inserted into the mouth in a fluid state, held in an impression tray. It is then allowed to gel, or induced to gell by introducing cold water through a water jacket in the impression tray, and after complete gelation, is removed from the mouth. Its elastic nature allows the impression material to spring out of undercuts after gelation with a negligible distortion. A hard model or cast is obtained by pouring hydrocol into such an impression, allowing it to set hard and then separating it from the impression. This model or cast is then the most accurate reproduction of the mouth structures that is possible. Any prosthetic appliance restoring individual teeth or combinations of teeth if made to fit the model accurately, should then fit the mouth structures with the same accuracy.

It is therefore the primary object of this invention to provide means for simplifying the pouring of the hydrocol into the elastic impression material to obtain a hard model or cast so as to provide dowel pins centered in each prepared tooth, and parallel to each other which will allow said prepared teeth to be removed and then resealed accurately in their original positions in the "master" cast.

The construction of this invention features the use of a clamp which has a plurality of tapered apertures therein for reception of the dowel pins. These dowel pins are adapted to be centered in the impression of a tooth a small distance above the elastic impression material. Then the pins may be removed from the vicinity of the impression, the impression tray removed from its indexed position in the instrument, hydrocol poured into it, and both pins and impression returned to their exact original positions. The dowel pins can then be positioned exactly as they were when previously centered due to the action of this device.

Still further objects and features of the invention reside in the provision of a pin centering and paralleling of the nature described that is strong

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and durable, simple in construction and manufacture, capable of being readily produced for wide distribution in the dental fields at a relatively low cost, while being highly effective in achieving highly accurate reproductions while using the new techniques necessary for proper handling of elastic impression material.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this pin centering and paralleling instrument, preferred embodiments of which have been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a perspective view of the entire instrument;

Figure 2 is a vertical sectional view as taken along the plane of line 2-2 in Figure 1;

Figure 3 is an enlarged sectional detail view of the clamp member and the bracket pivotally attached to the clamp member;

Figure 4 is a perspective view illustrating one of the clamps used for centering and paralleling the dowel pins comprising important elements of this invention;

Figure 5 is a sectional detail view illustrating in particular the tapered apertures in the clamp member and the tapered dowel pin;

Figure 6 is a bottom plan view of one of the clamp members;

Figure 7 is a top plan view of a clamp member showing the device as provided with a set screw having a slotted head;

Figure 8 is a view of the modified form of the invention similar to that of Figure 7 but showing the set screw being provided with an Allen head; and

Figure 9 is a top plan view of a further modification of the invention employing a Phillips head screw.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a base to which a fitting 12 is secured by screws, bolts or fasteners 14. The fitting 12 is provided with a tubular flange 16 having a set screw 18 threadedly secured therein for locking engagement so as to support and hold a vertically extending stand 20. There is also secured to the base 10 a cylindrical member 22 having a recess 24 therein for reception of the socket elements 26 and 28 forming one portion of the ball and socket joint including the spherical member 30 which is attached to an upwardly extending standard 32.

A threaded rod 34 is provided for tightening the socket elements 26 and 28 into clamping engagement with the spherical ball 36. The upper end of the standard 32 terminates in an annular flange 36 to which a tray 38 preferably formed from a transparent synthetic plastic material is secured by means of bolts 40. Obviously, the tray 38 may be formed from any other material as may be desired but the use of the aforesaid material has its advantages in enabling the operator to more easily remove the plaster index holding the impression tray after using.

Slidably embracing the stand 20 is a clamp member 42. A knurled headed thumb screw 44 is used to lockingly adjust the clamp member 42 at any desired height and position on the stand 20. The clamp member 42 is provided with bifurcations 46 and 47 between which there is received a bracket 48 which is mounted for pivotal movement by means of pin 50. The bracket 48 is provided with an extension or limit stop 52 having a flattened upper surface 54 adapted to abut against the lowermost surface of the clamp member 42 to limit rotation of the bracket 48. The bracket 48 includes a mounting plate 51 within which a vertically extending knurled head thumb screw 53 is threadably engaged. The thumb screw 53 extends through a slot 55 in a support plate 56 and the flange 58 of the thumb screw 53 plus a washer is adapted to lockingly hold the support plate 56 in an adjusted position relative to the mounting plate 51. The support plate 56 is provided with an arcuate configuration as at 60 in order that the dowel pin clamps as indicated at 62 may be arranged in such manner as to permit the dowel pin 64 to having their anchors 66 arranged to conform with the contours of a jaw and center of the prepared teeth of our impression.

Referring now particularly to Figures 4 through 9 wherein the dowel pin clamp 62 and the dowel pin 64 forming the most important elements of the invention are illustrated, it will be seen that each of the dowel pin clamps 62 are formed with a fixed lower jaw 68 and movable upper jaw 70. The upper jaw 70 is provided with a recess 72 within which an inner rib 74 is embraced. The inner rib 74 is formed on the connection 76 interconnecting the lower jaw 70 with a fixed portion 78 used in supporting the upper movable jaw 70. Attached to the upper jaw 70 is a guide rod 80 which extends through an aperture in the upper portion 78. Another aperture 82 is formed in the upper portion 78 for reception of a headed internally threaded collar 84 which extends through the upper portion and which is crimped as at 86 so as to form a flange preventing the disengagement of the sleeve 84 from the upper portion 78. The sleeve 84 has its internal threads threadably engaged with a threaded rod 88 rigidly attached to the upper jaw member 70. In this manner upon rotation of the headed sleeve 84 the upper jaw will be drawn upwardly toward the fixed portion 78 or urged downwardly toward the lower jaw 68. A slot 90 for reception of a screw driver is provided in the headed sleeve 84 and alternatively as is shown in Figures 8 and 9 an Allen head 91 may be provided for reception of an Allen wrench or a Phillips head 93 may alternatively be used. An outer reinforcing rib 92 is provided for the clamp 62 and extends about the fixed portion 78, the connecting portion 76 and the lower jaw 68. The portion of the rib 92 on the lower jaw 68 performs the additional

function of providing the lower surface of the jaw 68 with portions of varying depth. This is advantageous since a plurality of tapered apertures 94 are drilled into the lower jaw 68 for reception of beveled dowel pins 64. Hence, when the dowel pins 64 are positioned in the portion of the rib 92 they will extend somewhat below the dowel pins placed in the jaw 68 proper thus permitting greater flexibility in the use of this device. Sometimes clamps with a smooth, flat lower jaw 68 without rib 92 are used to permit all pins to be evenly positioned in lower jaw 68. These are desirable in addition to clamps with rib 92 on lower jaw 68. It is to be noted that the anchors 66 are provided with ridges and recesses in order that the plastic material being used in the cast may become bonded thereto thus assuring against the pins being accidentally disengaged.

In operation, after the impression has been taken, it is placed in a plaster of Paris matrix on tray 56. Then, the clamps 62 and the pins 64 are attached to the support plate 56 with the anchors 66 of the pins 64 positioned a small distance above the prepared teeth of an elastic impression material impression. The support plate 56 is preferably formed from a transparent plastic material in order that the impression may continuously be observed thus preventing any accidental distortion or destruction of the impression. Then, the clamps, dowel pins 64, and the entire bracket 48 may be rotated upwardly as is shown in the dotted lines in Figure 3 and this impression can be removed from its plaster of Paris matrix on tray 56, filled with hydrocal mixture for molding the cast, and returned to its original position on tray 56. Prior to the setting of the hydrocal mixture the bracket 48 will be depressed so as to immerse the anchors 66 in the hydrocal mixture. This mixture may be heaped up about the anchors if such is necessary so as to insure a proper bond. In this manner each of the desired teeth may be provided with a centrally located dowel pin even though the impressions of the teeth are not in view after the hydrocal mixture has been poured.

Since from the foregoing, the construction and advantages of this pin centering and paralleling instrument are readily apparent, further description is believed to be unnecessary.

However, since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may be readily resorted to as desired.

What is claimed as new is as follows:

1. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures.
2. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering

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apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, the under surface of said lower jaw having more than one portion each of varying depth, said apertures being arranged in parallel rows along the said portions.

3. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said apertures being arranged in parallel rows.

4. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member.

5. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member, the under surface of said lower jaw having more than one portion each of varying depth, said apertures being arranged in parallel rows along the said portions.

6. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member, said apertures being arranged in parallel rows.

7. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of

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tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member, said clamp member having a bifurcated outer free end portion, said bracket being pivotally secured within said bifurcated free end portion, said bracket having a projecting stop member extending inwardly of said bifurcated portion and selectively abutting against said clamp member to provide a limit stop to the rotation of said bracket relative to said clamp member.

8. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member, said clamp member having a bifurcated outer free end portion, said bracket being pivotally secured within said bifurcated free end portion, said bracket having a projecting stop member extending inwardly of said bifurcated portion and selectively abutting against said clamp member to provide a limit stop to the rotation of said bracket relative to said clamp member, the under surface of said lower jaw having more than one portion each of varying depth, said apertures being arranged in parallel rows along the said portions.

9. A dowel pin centering and paralleling instrument for restorative dentistry comprising a clamp for engaging a support plate, said clamp having an upper jaw and a lower clamping jaw adapted to hold said plate therebetween, a plurality of spaced upwardly extending and tapering apertures in said clamp, and a plurality of tapered dowel pins received in said apertures, said dowel pins being frictionally held by said clamp in said apertures, said clamp being supported by said plate over a tray, said plate being adjustably secured to a bracket, a base, a stand on said base, a clamp member vertically adjustable on said stand, said bracket being pivotally attached to said clamp member, said clamp member having a bifurcated outer free end portion, said bracket being pivotally secured within said bifurcated free end portion, said bracket having a projecting stop member extending inwardly of said bifurcated portion and selectively abutting against said clamp member to provide a limit stop to the rotation of said bracket relative to said clamp member, said apertures being arranged in parallel rows.

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