Sept. 16, 1958 R. SPALTEN ET AL 2,851,728

INTERLOCKABLE DENTAL DOWEL PIN AND REPOSITIONING GAUGE AND METHOD OF USING

Filed July 14, 1954

FIG. 1.

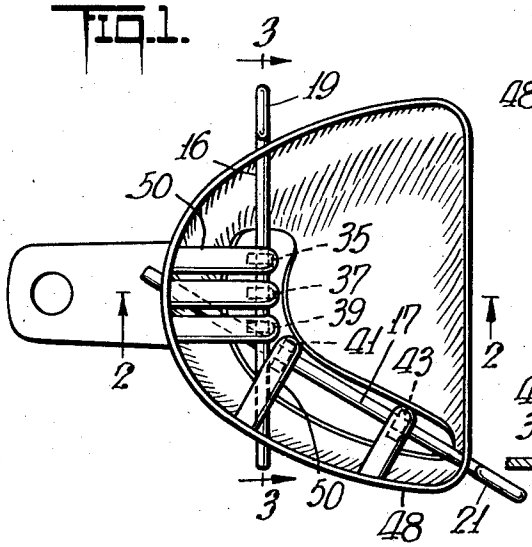


FIG. 2.

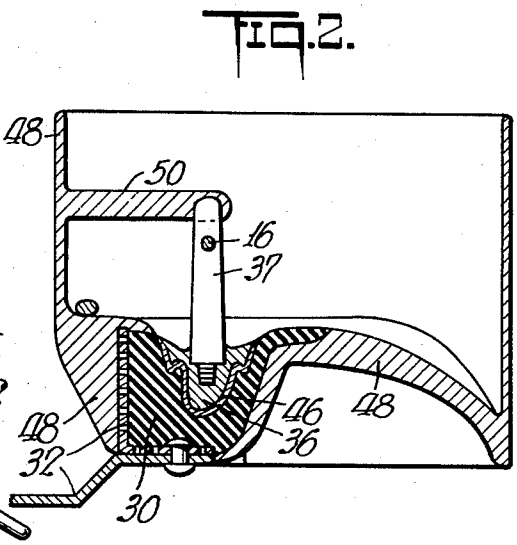


FIG. 3.

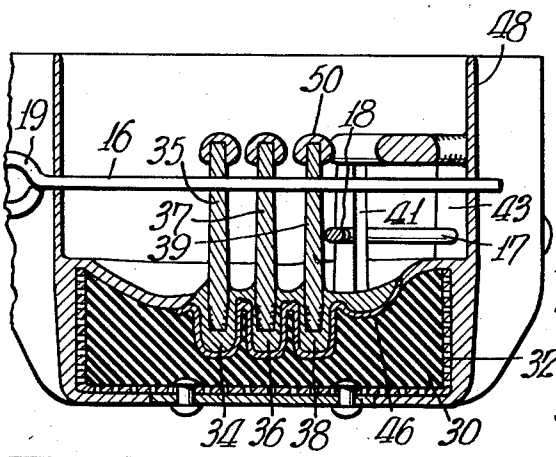


FIG. 4.

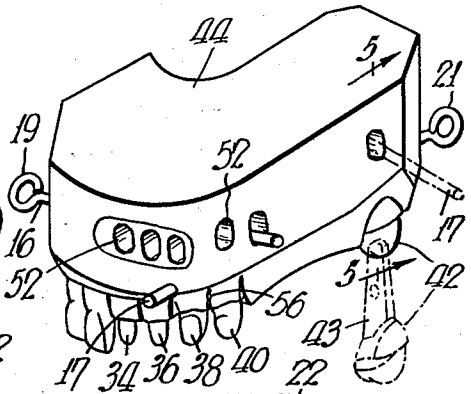


FIG. 5.

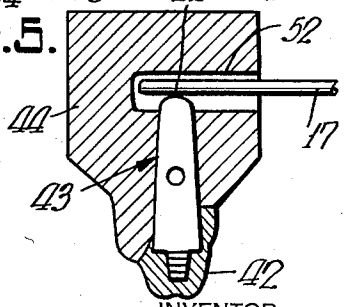


FIG. 6.

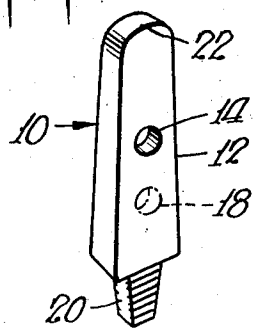
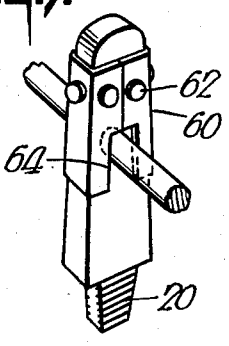


FIG. 7.



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INTERLOCKABLE DENTAL DOWEL PIN AND REPOSITIONING GAUGE AND METHOD OF USING

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5 Claims. (Cl. 18—34.1)

Our invention relates to dowel pins such as are used in indirect inlay, crown, precision splint, fixed and removable bridge techniques.

The dowel pins presently in use rely upon a taper to insure placement of the die in the model, some with a flat face on one side of the body to prevent rotation. The pin may be threaded to a slotted nut to hold the die securely in place. However, a speck of dirt, stone or wax in the seat will prevent accurate reseating in the cast, thus destroying the relationship to adjacent and opposing teeth. The nut may be tightened excessively, or its seat scored, which will destroy its proper fit. The incidence of error is increased the more the die is removed and reseated, and only when the dental restoration is completed is the degree of error manifest.

It is therefore an object of our invention to provide a means for positive reseating of the dies and a means for relating the dies to adjacent and opposing teeth during the various stages of construction. Further objects are to provide a means for checking the relationship between dies and their seats, without danger to accuracy; to provide simplicity of construction with ease of manipulation; to provide a design for seating of the dies which will reduce production costs; to provide greater durability in the die reseating means; to provide the utmost convenience in articulating the cast; and to provide a dowel pin having all the foregoing advantages and which perfects the single impression technique developed as an aid in dentistry and which extends the scope thereof to larger spans in the mouth than are possible with other known means.

We accomplish these and other objects and obtain our new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing in which:

Fig. 1 is a plan view of our dowel pins with repositioning gauges in a rubber impression, set in a wax box provided with bridging wax plugs.

Fig. 2 is a sectional view taken in the plane 2—2 of Fig. 1 through one of the wax plugs.

Fig. 3 is a sectional view taken in the plane 3—3 of Fig. 1 through one of the repositioning gauges.

Fig. 4 is a perspective view of a fragment of the stone model made from the rubber impression.

Fig. 5 is an enlarged fragmentary sectional view taken in the plane 5—5 of Fig. 4 with access to the end of the pin formed by the wax plug.

Fig. 6 is an enlarged perspective view of one of the pins.

Fig. 7 is an enlarged perspective view of the pin with detachable metal seat.

As is shown in Fig. 6, the novel dowel pin **10** comprises a tapered body **12** having an aperture **14** for the insertion of the repositioning gauge **16** therethrough, as shown in Fig. 3. Some dowel pins are provided with apertures in relatively lower positions on the tapered body

shown in dot-dash position **18** in Fig. 6 in order that the gauge **17** may pass gauge **16** should the dowel pins round the arch of the mouth, as in Figs. 1 and 4. The stems **20** are serrated or knurled to aid in securing the dowel pin to the die metal as shown in Figs. 2 and 3.

In Figs. 1, 2 and 3, there is illustrated a single impression **30** made of rubber mounted on a tray **32**. This impression is made of the prepared teeth in the mouth. In the particular impression, the die metal represents teeth **34**, **36**, **38**, **40** and **42** shown prepared as abutments for bridgework with the corresponding dowel pins **35**, **37**, **39**, **41** and **43** in place prior to pouring of the stone cast **44**. The impression material **30** is silver plated, as at **46**, to hold the die metal which is poured with the dowel pins in position. This position is maintained by the repositioning gauges **16** and **17** which pass through the apertures in pins **35**, **37**, **39**, **41** and **43**, respectively. A wax box **48** is prepared for confining the casting, and the repositioning gauges may be supported in the walls thereof when the die metal is poured.

The heads of the dowel pins are rounded as at **22** to facilitate removal of the dowel pins from the stone cast. Bridging wax plugs **50** may be extended from the wax box wall to the rounded ends **22** to form recesses **52** in the stone cast, which provide access to the rounded ends of the pins when the wax is melted. This is shown in Fig. 4.

The stone is cast and thereafter the wax is removed, and slots **56** are cut to free adjacent dies. The gauges **16** and **17** are then removed by pulling at their heads **19** and **21**, respectively, which are enlarged for this purpose. The gauges may be lightly coated with a lubricant to facilitate removal. Then the gauge is inserted into the recess **52** and the rounded end **22** of the dowel pin gently pressed outwardly to free the respective dowel pin from the stone cast. The dowel pin may be similarly provided with a thin lubricating coat of oil to assist in freeing the pin.

By means of our invention, the dowel pins may be accurately reseated in the cast and related to adjacent teeth during the processing of bridgework. The repositioning gauges may be inserted in the respective apertures in the dowel pins to determine whether the tapered walls are free of loose particles that may be deposited during processing. Thus a positive check for accuracy is obtained without danger of damage to the stone cast.

The dowel pins are preferably made of flat stock which orients the dowel pins into their respective tapered sockets. Otherwise, if made in conical shape, it would be necessary to slowly revolve each dowel pin until the axis of the aperture is in line with the axis of the repositioning gauge.

A sleeve **60** provides an accurate fixed socket which is free of wear and justifies the added expense. It can be made of thin sheet metal stock as shown in Fig. 7. It closely conforms to the tapered wall of the dowel pin and may be keyed, if round, to the dowel pin, to orient the dowel pin when inserted. Slight projections **62** may be formed in the outer wall of the sleeve to retain the sleeve to the cast stone wall and resist removal when the dowel pin is ejected. A cut-out **64** may be provided for entrance of the repositioning gauge. By using a cut-out instead of a fitted aperture in each sleeve for the retention pin, it is unnecessary to closely fit each sleeve to each pin to align the two parts.

It will thus be seen that the dowel pins are not limited to any specific shape. The apertures and repositioning gauges need not be round. The pin materials may be hard brass, but other material may be used, such as stainless steel. Other methods of detachably interlocking the dowel pin to the repositioning gauges may be employed.

Having obtained the accuracy needed for the single impression technique, we have found that it is now possible, for the first time, to extend the single impression technique from single castings and small spans to large multiple abutment spans as a means of obtaining full mouth rehabilitation. This represents an advance in dentistry as a preventative remedy in contradistinction to the simple reparative approach that small span bridgework can provide. The ability to make precision splints and large span bridgework is invaluable in the treatment of pyorrhea and the prevention of recurrent caries.

We have thus described our invention, but we desire it understood that it is not confined to the particular forms or uses shown and described, the same merely being illustrative, and that the invention may be carried out in other ways without departing from the spirit of our invention, and, therefore, we claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of our invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

We claim:

1. In the method of reproducing the condition of the mouth for forming inlays, crowns and fixed bridges after cutting the teeth in the appropriate shape, which comprises making a negative impression with shape retaining material in the mouth of the cut teeth, the step of positioning a dowel pin having a stem and a body with the stem in the negative impression of each cut tooth, connecting a repositioning gauge to the body thereof, forming dies of rigid material inside the negative impression of each cut tooth and about the stem of the dowel pin, forming a cast of rigid material about the bodies of the dowel pins and repositioning gauges, removing the repositioning gauge from each dowel pin, removing the negative impression from the dies to expose the positive replicas of each original cut tooth and removing each die from the cast of rigid material, whereby each die and attached dowel pin may be reseated in the proper position in the cast of rigid material by reconnecting the repositioning gauge to the dowel pins, thus maintaining the relationship between the various teeth in the construction of the inlays, crowns and fixed bridges.

2. The method of claim 1 including the step of covering the end of the dowel pin with a wax bridge leading to the outside of the mold prior to forming the cast of rigid material to facilitate removal of the dowel pin and associated die from the cast of rigid material.

3. The method of claim 1 including the step of providing the dowel pins with removable metal sleeves which are retained in the cast of rigid material when the dowel pins are withdrawn.

4. In combination, a dowel pin and repositioning gauge for detachable connection thereto, said dowel pin having a locking means for rigid connection to a die metal casting of a cut human tooth, said pin tapering in width and depth towards the free end thereof to facilitate removal from rigid material that is cast thereover and having an aperture in the free end for insertion of the repositioning gauge therein, said repositioning gauge comprising a member of uniform cross-section.

5. The combination of claim 4 having a closely fitted and detachable metal sleeve closely conforming to the tapered end of the dowel pin adjacent the gauge connecting portion, said sleeve having extending means for securement to a cast of rigid material molded thereabout.

References Cited in the file of this patent

UNITED STATES PATENTS

1,144,336	Whiteley	June 22, 1915
1,507,024	Monson	Sept. 2, 1924
2,274,060	Hart	Feb. 24, 1942
2,310,830	Blair et al.	Feb. 9, 1943
2,423,330	Levine	July 1, 1947
2,433,889	Bryant	Jan. 6, 1948
2,434,416	Kohn et al.	Jan. 13, 1948
2,576,206	Barth	Nov. 27, 1951
2,648,136	Lanigan	Aug. 11, 1953