Dowel Orienting Apparatus Useful in Dentistry

Filed April 10, 1969

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Inventor
Eric H. Zahn

By
Ford E. Smith
Attorney
ABSTRACT OF THE DISCLOSURE

To a base member adapted to receive and support an upwardly open dental impression, a carrier member is keyed for separation by relative vertical movement. An arched element has a first leg positioned in depending relationship to the dental impression which leg is adapted to separably suspend a dowel oriented relative a tooth impression. Second leg of the arched element is received and supported in a mass of plastic material on the carrier member.

SUMMARY OF THE INVENTION

In the initial stages in the manufacture of dental restorations an impression is taken on the teeth of a patient's jaw by means of moldable, usually polymerizable, impression material. In general, the impression is a U-shaped negative reproduction of the full jaw and such teeth as it includes. Using the impression as a mold, a cast of plaster is then made to produce, in positive form, the patient's jaw and tooth structure as a model. According to a common technique, it is often desirable that a dowel pin be cast in place within one or more of the teeth of the model to provide means whereby sections or portions of the plaster model may be removed and replaced with accuracy during the waxing-up stages of the technique. In the prior art a variety of apparatuses have been supplied for disposing such a dowel pin in its desired upright relationship with respect to the impression and a tooth cavity. However, it is desirable during production of the model that the dowel pins be displaced from such selected position while the semi-fluid and viscous plaster is being cast in place. The common practice is to fill the impression with semi-fluid plaster and to subject the impression to a vibratory force which works the plaster into all of the quite delicately molded cavities of the impression for the purposes of insuring that the impression be filled and that all entrapped air bubbles are worked out. This having been accomplished, it is then desirable to the technician to replace the dowel pin or pins in the previously oriented relationship with respect to the impression and its cavity. This must be accomplished "blind" since then the cavities are no longer in view. The dowel pin is only partially embedded at this stage. Various means in the prior art have been employed for returning the dowel pin or pins to the same relationship that they previously occupied absent the casting plaster. After the stone has hardened, the partially embedded dowel pin is released from whatever support member may have been employed and the support means is removed. Usually a separating material is applied to the hardened stone particularly in the area around the upward protruding end of the dowel pin. Additional stone or plaster is poured on the previous cast to provide a base for the tool model. When this additional stone is hard, the tooth model is usually cut and shaped to remove excess stone and to permit the model to rest on a work surface. The technician then makes saw cuts in the model between certain teeth down into the base sufficiently to intersect the parting line. Thereupon a section of the model may be separated from the rest of the model. He can always return the same accurately to position on the model by reorienting a protruding end of the dowel pin into the sockets formed in the model base.

A primary object of this invention has been the provision of dowel orienting apparatus useful in dentistry in which there are dowel support means permitting accurate, firm and rapid dowel positioning to an infinite number of positions, and which are removable and returnable in such manner as to insure correct reorientation of the dowel pin after the same has been separated from a dental impression with which it was originally oriented.

Another object of the invention is the provision of a dowel orienting apparatus which is simple and inexpensive to produce and which may be used with but the simplest of tools and requiring a relatively low order of skill to obtain accurate and indexed position of dowel pins with respect to dental impressions.

These and other objects of the invention will become apparent to those skilled in the art from the following description.

Detailed description

In FIG. 1 is shown an impression tray or holder which is generally horseshoe in plan and is U-shaped in cross section. In short, the holder provides a U-shaped trough into which the dentist places a plastic impression material to be applied to the patient's jaw to take an impression thereof. In FIG. 1 the impression is negative of the actual physical conditions of the teeth and jaw of a patient. It includes tooth cavities. Usually the material from which the impression is formed is of a resilient nature and has characteristics whereby it sets from its moldable form into a state where it may no longer be caused to permanently change shape while still retaining a degree of resiliency.

Dowel pin 16 of FIG. 2 has a tapered end 18 and a knurled end 20 to be embedded in a stone model. Usually the tapered end 18 is fully flat sided and, in some instances, the tapered end is frusto-conical and has a flat or keying side. There are a variety of such dowel pins available and commonly used by dental technicians.

The dowel orienting apparatus of this invention comprises a base member 22, a carrier member 24 and an arched element 26, as shown in FIG. 3.

The preferred form of base member 22 includes a bottom plate 28 of circular shape in the center of which is an upstanding column 30 that receives and supports a dental impression. Wall 32 upstands from the base 28 and substantially embraces column 30. To provide access to a dental impression on column 30 at one side and for keying purposes, wall 32 is interrupted by slot 34 as best seen in FIG. 3.
Carrier member 24 in the preferred form of this invention fits around or encloses wall 32. Carrier 24 comprises inner wall 36 and outer wall 38, both rising from bottom 40. Walls 36 and 38 are likewise interrupted to form an opening 42 at which ends walls 44, 46 engage the edges of slot 34. Carrier 24, by vertical movement, may be dropped over or removed from base member 22. The instancing flanges 46, 48 intersect with the edges of wall 32 forming slot 34. In this manner base 22 and carrier member 24 are keyed together for disassembly or reassembly by relative sliding movement of the parts. Carrier 24 in effect is a vessel, the shape of which is defined by walls 36 and 38, bottom wall 40 and end walls 44, 44. This vessel is normally filled with plaster or stone and is usually placed upon a vibrator mechanism to cause the semi-fluid plaster to work itself into all of the crevices and contours in impression 12. This initial cast 60 usually rises to the dotted line indicated in FIG. 5. Thereupon the technician reassembles the carrier 24 onto the base member 22 by lowering it from above until it again rests on the flange 28 of base 22. In the process the dowel pins on arch elements 26 are inserted into the still soft plaster in the same predetermined orientation with respect to a tooth cavity that the technician had established before the plaster was poured.

When the initial cast 61 of plaster has set so that the dowel pins 26 are firmly anchored in the plaster, the apparatus may be disassembled by withdrawing the sleeves 56 from the tapered ends 18 of the dowel pins and by withdrawing the arch elements 26 from the above anchored and supporting positions in the putty-like material 58 of the carrier member. At that time the technician usually applies a separating material on the hardened surface of the cast plaster about the outwardly protruding dowel pin or pins. Then an additional amount of plaster is poured or molded on the initial pour and hardened to form the base 62 for the tooth model. A single tooth model 64 and portion 66 of model 61 is shown in FIG. 6 as separated from the rest of the model. The dowel 16 is withdrawn from socket 68 and may easily be returned when desired. The utility and mode of use of this apparatus will be readily apparent to those skilled in the art. Alternatives and modifications will occur to those having skill in the pertinent art and all such as fall within the scope of the subjoined claim is considered part of this invention.

What is claimed is:

1. A dowel-oriented apparatus useful in dentistry, comprising:
   a base member having a pedestal to receive and support in elevated manner a dental impression;
   a vessel keyed to and removably associated with said base member by relative vertical movement and containing a mass of putty-like material in peripheral relation about an impression mounted on said pedestal, said mass extending from above to appreciably below an impression mounted on the pedestal of the base member;
   an inverted U-shaped element formed of wire having a first leg and a second parallel leg, said second leg being longer than said first leg so as to be initially embedded in the upper part of said mass and rotatably supported thereby so that said first leg may be aligned in depending relation above the dental impression, and then lowered with respect to said impression; and
   means cooperable with said first leg to separately suspend a dowel selectively oriented relative the impression.

References Cited

UNITED STATES PATENTS
2,836,849 6/1958 Humphrey 32--11UX
2,842,845 7/1958 Carlson 32--67
3,277,576 9/1966 Kraft 32--40
3,436,829 4/1969 Jermy 32--40

ROBERT PESHOCK, Primary Examiner

U.S. Cl. X.R.

32--40