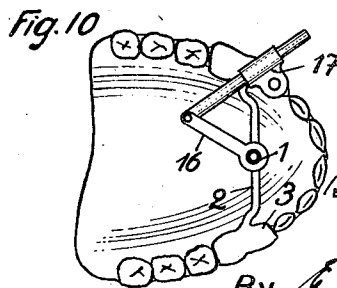
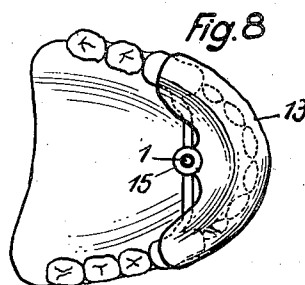
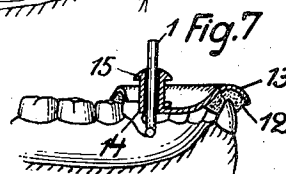
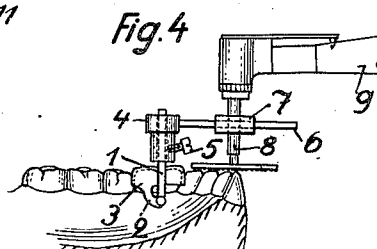
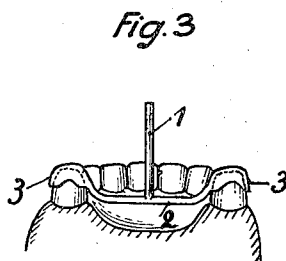
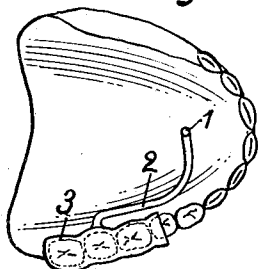
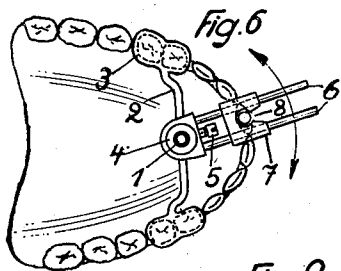
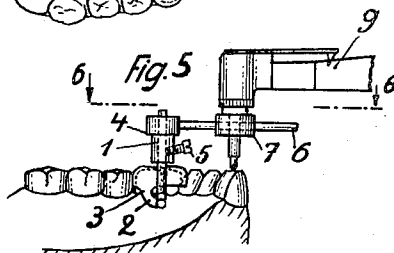
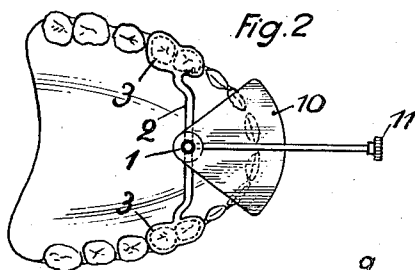
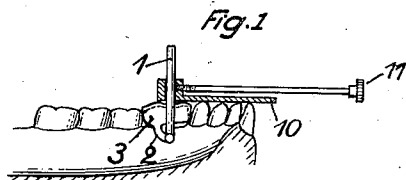


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APPARATUS FOR THE PRODUCTION OF DENTURES AND
METHOD OF MAKING SUCH APPARATUS
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APPARATUS FOR THE PRODUCTION OF
DENTURES AND METHOD OF MAKING
SUCH APPARATUS

Bruno Weigele, Leipzig, Germany

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My invention relates to a method and an apparatus for making dentures, and a method for making such an apparatus, and especially to an apparatus for guiding the instruments of a dentist during grinding and polishing the teeth of a patient.

A principal object of my invention is to provide an instrument which enables the dentist independently of personal skill to drill the holes in the teeth for fitting the dentures exactly parallel and with certainty to the same depth at all places, in the lower jaw as well as in the upper jaw.

A further object is to produce dentures or dental attachments with such a high degree of accuracy that they scarcely require any adhesive material or cement and indeed even when no separate auxiliary devices are used cannot be removed from the teeth again.

Still another object is to facilitate the taking of impressions especially of large sections of the mouth of the patient, particularly to prevent distorting or twisting the impression when it is removed from the teeth.

Further objects and advantages will be apparent from the following description:

Dentures or dental attachments, such as crowns or bridges or splints, which are fitted in order to fix teeth which have become loose usually have to be attached by means of a number of pins to the teeth or the roots which are still sound. If the pins are not guided exactly parallel in the holes provided for them the fitting and insertion of the dentures or attachments is possible only with difficulty and either leads to bending of the dentures or else the holes have to be appropriately enlarged which in turn has an extremely detrimental effect on the strength of the denture or attachment. Hitherto it has been practically impossible to drill the guide holes for the pins of such dentures or attachments exactly parallel and to a uniform depth, because the drilling had to be done by hand and however great the skill of the dentist might be and however expert he might be at judging with the eye, it was impossible to drill accurately parallel holes of uniform depth.

In accordance with my invention, a guiding member for the dental instrument, that is to say for the drill, grinding wheel or the like, is fixed in the mouth of the patient, which guiding member is able to move in a plane lying at right angles to the longitudinal axis of the teeth to be treated. By means of the guiding member which is movable in this manner, drilling,

grinding and other instruments can be accurately applied at all points of the jaw at which the operations in question are to be carried out, and the guide member ensures that the instrument is constantly and uniformly guided and guesswork on the part of the dentist is eliminated.

For the attachment of the guiding member there is preferably provided a pin which is firmly secured in the mouth of the patient in a position in which it is parallel to the longitudinal axis of the teeth to be treated. This pin is supported by a bar which is secured to caps fitted on the teeth. The guiding member is pivotally mounted on this pin.

In order that my invention may be readily understood and carried into effect, some forms of apparatus constructed in accordance with my invention are illustrated by way of example in the accompanying drawing, in which—

Figure 1 shows an auxiliary device for fitting the guiding pin in the mouth of the patient in section,

Figure 2 is a plan of this device seen from above,

Figure 3 shows the pin when mounted in the mouth,

Figure 4 shows the pin with the guiding member for the dental instrument attached thereto; the instrument illustrated being a grinding wheel.

Figure 5 is a similar view, but showing a drill being provided instead of a grinding wheel.

Figure 6 is a section on the line 6-6 of Figure 5.

Figure 7 shows in section an impression tray which contains dental impression material mounted on the guide pin.

Figure 8 is a plan of Figure 7 seen from above.

Figure 9 shows how the pin is fixed in the jaw when the teeth are missing on one side, and

Figure 10 shows a pivotal support for the guiding member.

Referring to the drawing, the apparatus (see Figures 5 and 6) consists of a pin 1 which is attached to the sound teeth by means of a transverse bar 2 and caps 3. This pin carries a sleeve 4 which is detachably connected by means of a screw 5. On the sleeve 4 is mounted a guide rail 6 which in its simplest form consists of two rods. This guide rail 6 is mounted so that it can turn about the pin 1 even when the sleeve 4 is firmly fixed by the screw 5. A sliding member 7 slides on the guide rail and acts as a guide for the dental instrument 8 which

consists, in the example illustrated, of a drill which is fitted in the usual hand piece 9 which is held by the dentist.

For enabling my invention to be clearly understood, the manner in which the work is carried out with the assistance of my new device will now be described, it being assumed that the work in question is the fitting of a splint on the front lower incisors. In the first place the incisors to which a splint is to be applied are levelled as far as possible, by hand judging by the eye. An impression is then taken of the entire jaw. Upon the cast obtained from this, appropriate tooth caps 3 of any suitable material are fitted on the molars as an anchoring means for anchoring the transverse bar 2 relatively to the teeth. These caps 3 are connected together by means of the transverse bar 2. The bar 2 is so disposed that it restricts the movement of the tongue as little as possible. An adjusting plate 10 (see Figs. 1 and 2) is now placed on the incisors of the cast. This adjusting plate carries in a sleeve the guide pin 1, which is fixed vertically in the sleeve by means of a screw 11 which may be operated from the outside. By means of this plate the pin is placed in the correct position on the transverse bar 2 and is temporarily attached, for example, by means of pieces of wax or the like. The adjusting plate 10 is then unscrewed from the pin 1 and removed and the pin 1 is soldered to the transverse bar 2 in the position in which it was placed.

Figure 3 shows the device thus prepared which consists of the caps 3, the transverse bar 2 and the guide pin 1 attached thereto. It is advisable that the pin should not project beyond the cutting edges of the teeth by more than approximately 10 to 12 mm. in order that the patient may be able to close his mouth and swallow while the dentist is at work without the pin which is in his mouth injuring the gums. In order not to interfere otherwise with the work the rod should lie approximately 12 to 15 mm. behind the teeth. It is evident that the entire supporting frame may be made of any suitable artificial material instead of metal.

For the actual dental work the supporting frame is temporarily fixed or cemented in the mouth of the patient. The sleeve 4 and the pivoted guide rail 6 (see Figs. 5 and 6) are now placed on the guide pin and the sleeve screwed tight at the desired height by means of the screw 5. The screw 5 is preferably mounted obliquely so as to be more easily accessible. The sliding member 7 which acts as the actual guide for the dental instrument is fitted on the rail 6. This sliding member is advantageously provided with a V-shaped slot in front in order on the one hand to facilitate the introduction of the drill and on the other hand not to obscure the view during work. If a grinding wheel is to be employed instead of the drill, the grinding disk 8 (see Fig. 4) is first put in the sliding member 7 and the latter is inserted on the guide rail 6. Only after this has been done is the disk 8 secured to the hand piece 9. As may readily be seen the novel guide offers an absolute guarantee that the work on all the teeth is carried out completely uniformly and in the same direction. The sliding member also acts as an abutment for the hand piece 9 and therefore enables holes of exactly the same depth to be bored in all cases. This depth can be adjusted as desired by varying the position of the sleeve 4 on the guide pin 1 with the aid of the screw 5.

The metal pins, a stock of which is kept by the dentist are now inserted into the appropriately drilled holes and the impression of the diseased teeth is prepared. It is particularly important in this connection that the material in which the impression is made should not be distorted or twisted when it is removed from the teeth since it is obvious that if it is distorted the denture will not fit accurately. Taking impressions especially of large sections of the mouth has hitherto called for a very great amount of skill on the part of the dentist. My new apparatus considerably facilitates this operation also.

The material 12 in which the impression is made (see Figs. 7 and 8) is put into an impression tray which is roughly of the shape of the teeth to be treated. In accordance with my invention, this impression tray is provided with a sleeve 14 which has a flanged edge 15. The sleeve fits accurately over the rod 1 and the impression tray 13 may be lifted from the teeth together with the material in which the impression is made after it has hardened by gripping the edge 15 with a suitably bent pair of forceps. The distance which separates the impression tray from the teeth and thus the thickness of the material which takes the impression may easily be regulated by appropriate dimensioning of the length of the tube 14. Since the impression tray is withdrawn along the guide rod 1 and thus parallel to the longitudinal axis of the teeth to be treated, any distortion of the impression during lifting is positively prevented. In order to facilitate fitting, the impression tray may be provided at a certain point, for example in the middle, with an indication which is caused to accord with an indication which is provided on the teeth.

It is evident that my new apparatus is in no way confined to the operation which has been described by way of example. It can instead be used for a wide variety of other purposes; thus for example, for the parallel excavation of the roots of teeth which are to receive artificial crowns and also for crown and bridge work of every description. Instead of the horizontal guide member which has been illustrated, and in which the sliding device has a vertical hole, the guide member may also be arranged obliquely especially when it is a case for example of grinding teeth surfaces obliquely and parallel to one another. In this case various angular positions may be chosen.

It is evident that my new device may be used also for dental work in the upper jaw. In this case care must be taken that sufficient space is left for the manipulation of the dental mirror. It is desirable therefore to arrange the guide pin 1 in the upper jaw somewhat more to the rear than in the lower jaw or to attach the pin only to one side of the jaw at the inside or outside so that there is sufficient room available on the other side for the manipulation of the mirror. An attachment on one side only may also be necessary if the jaw has sound teeth only on one side (Fig. 9). In order to increase the movability of the device, especially in the case of work on the upper jaw, the guide member may also be arranged, as is illustrated in Figure 10, on a pivotal arm 16 which may be attached on the gum or cheek side. The guide member 17 is then arranged revolvably on the pivoted arm in order to enable work to be carried out in various angular positions relatively to the longitudinal axis of the teeth to be treated. The angular position is

of course secured in each case by a small screw which is not illustrated here.

What I claim is:

1. Apparatus for use in the treatment of teeth comprising a pin, means for supporting said pin in the free space in the oral cavity of a patient in substantially parallel and spaced relationship to the longitudinal axis of the teeth to be treated, a guide for a dental instrument pivotally mounted on said pin and vertically adjustably securable thereto and so constructed and arranged that the dental instrument may operate selectively on any of said teeth with its axis in substantially parallel relationship to said pin.

2. Apparatus for use in the treatment of teeth comprising a pin adapted to be arranged in the free space in the oral cavity of a patient, a transverse bar supporting the pin in a position essentially parallel to the longitudinal axis of the teeth to be treated, and caps adapted to removably fit over the jaw of the patient, said caps being securely fastened to the ends of said transverse bar, and a guide for a dental instrument oscillatably mounted on said pin and vertically adjustably securable thereto, said pin being arranged on said bar in spaced relationship to said caps.

3. Apparatus for use in the treatment of teeth comprising a pin adapted to be arranged in the free space in the oral cavity of a patient, a transverse bar supporting the pin in a position essentially parallel to the longitudinal axis of the teeth to be treated, and caps configured to removably fit over teeth on opposite sides of the patient's jaw, said caps being integrally united with the ends of the transverse bar, and a guide for a dental instrument oscillatably mounted on said pin and vertically adjustably securable thereto, said pin being arranged on said bar in spaced relationship to said caps.

4. Apparatus for use in the treatment of teeth comprising a pin, means for supporting said pin in the free space in the oral cavity of a patient in substantially parallel and spaced relationship to the longitudinal axis of the teeth to be treated, a guide for a dental instrument pivotally mounted on said pin and so constructed and arranged that the dental instrument may operate selec-

tively on any of said teeth with its axis in substantially parallel relationship to said pin, and means for adjusting the vertical position on the pin of the pivotally mounted guide for the dental instrument and for securing said guide in adjusted position.

5. Apparatus for use in the treatment of teeth comprising a pin, a transverse bar with said pin in spaced relationship to the teeth being treated connected to said pin, said pin and transverse bar being adapted to be arranged in the free space in the oral cavity of a patient, tooth caps secured to the transverse bar and adapted to be superposed on sound teeth in the jaw of the patient, a sleeve mounted on said pin and capable of vertical adjustment thereon, means for securing said sleeve in adjusted position, and a guide for a dental instrument carried by said sleeve.

6. An apparatus for use in the treatment of teeth comprising a pin, a connecting bar with caps supporting said pin, said pin being positioned intermediate said caps and in spaced relationship thereto, said caps being adapted to be fitted over sound teeth in the jaw of the patient, a rail pivoted on the pin by means of a sleeve, and a guide for a dental instrument slidably fitted on the rail.

7. An apparatus for use in the treatment of teeth comprising a pin, means to fix said pin in the mouth of the patient parallel to the longitudinal axis of the teeth to be treated and in spaced relationship thereto, a rail pivoted on the pin by means of a sleeve, a guide for a dental instrument slidably fitted on the rail, and means to fix the sleeve at the desired height.

8. A method of making an apparatus for use in working on unsound teeth which comprises levelling said teeth by a disk, taking an impression of the jaw and making a cast of it, fitting caps connected by a bar to teeth removably mounting a pin substantially at the vertex of a flat sector-shaped adjusting plate, positioning said pin on said bar while supporting said plate on said leveled teeth, integrating said pin and bar in the said position, and finally removing said plate from said pin.

BRUNO WEIGELE.