

[72] Inventors **Irving Neustadter**
Brooklyn;
Michael C. Howard; George Klein, North
Woodmere, N.Y.

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[73] Assignee **Dental Innovations, Inc.**
New York, N.Y.

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Primary Examiner—J. Spencer Overholser
Assistant Examiner—Ben D. Tobor
Attorney—John M. Montstream

[54] **PREFABRICATED DENTAL PATTERN HAVING
 ADJUSTING SLOT MEANS
 6 Claims, 8 Drawing Figs.**

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ABSTRACT: A thin pattern for a lingual frame or portion of a dental restoration is disclosed and has particular applicability to the type known as a veneer crown or veneer-type bridge. The pattern includes the lingual wall and the mesial and distal walls extending forwardly therefrom. The outer surfaces of these walls conform, or conform approximately to the surfaces of the corresponding or particular natural tooth. The pattern has slot means, preferably a single central slot, extending rearwardly from the incisal or forward edge to roughly a mid point of the pattern so that the pattern can be narrowed or widened to conform to the space between abutting teeth. The gingival portion of the pattern is rounded so as to fit or can be modified to fit on a coping or a tooth stub. The pattern is made of plastic material or a suitable metal such as gold, having sufficient softness or pliability so that it can be modified to suit the dental technician as to shape, and/or dimension and having sufficient retentivity so that the pattern remains fixed in the adjusted or modified form.

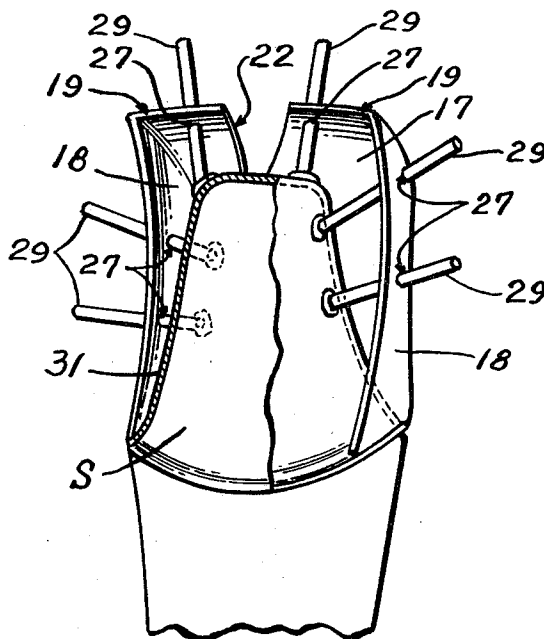


Fig. 1 **Fig. 2** **Fig. 3** **Fig. 4**

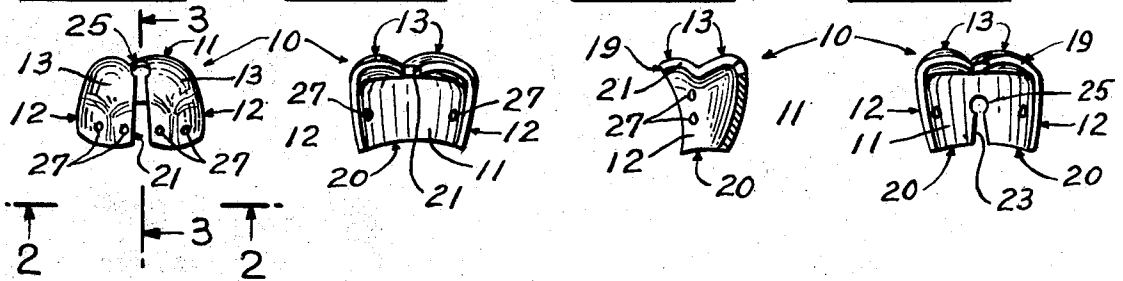


Fig. 5

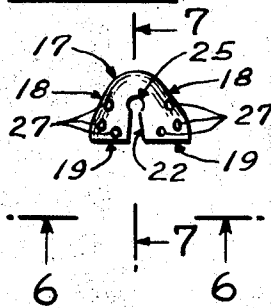


Fig. 6

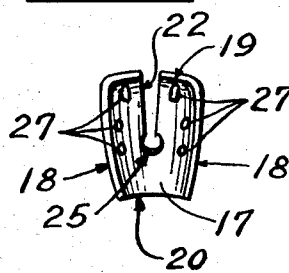


Fig. 7

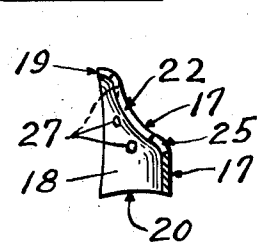
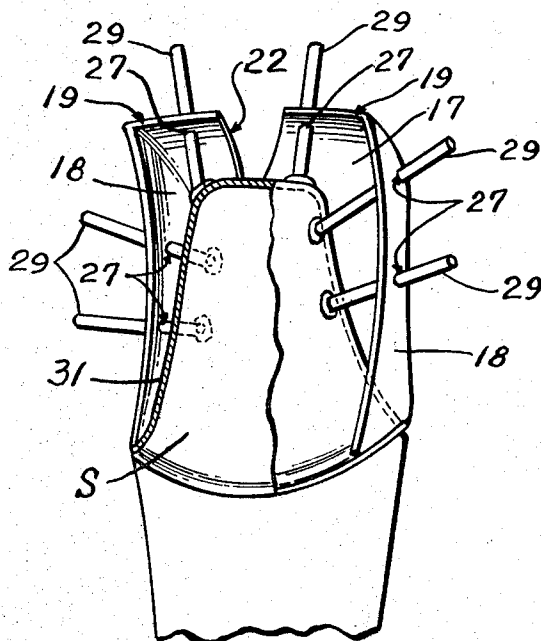


Fig. 8



INVENTORS
IRVING NEUSTADTER
BY MICHAEL C. HOWARD
GEORGE KLEIN
John M. Montstream
ATTORNEY

PREFABRICATED DENTAL PATTERN HAVING ADJUSTING SLOT MEANS

In making a restoration either a single tooth or a bridge, the present practice is to carve or shape in wax, the lingual portion of the tooth or teeth to be replaced, whereupon the wax pattern or form is or forms are invested in a mold. The wax is burned out from the mold cavity by applying heat in known manner. The mold cavity is then filled with dental metal, in known manner, to form a cast frame. The carving of the wax form requires considerable time and requires a highly skilled dental technician. With the pattern herein, the dental technician selects the proper pattern or patterns for the tooth or teeth to be replaced and widens or narrows the pattern or patterns, if necessary, to fit into the space between the two abutting teeth, after which the slot and interior of the pattern is filled with wax and perhaps the bottom portion is filled or extended with wax to complete the exterior and interior form of the frame construction as well as its length, if needed, for the tooth or teeth of the bridge. A pattern will be provided for at least each different tooth so that the proper pattern or patterns may be selected by the technician depending upon the restoration to be made.

It is an object of the invention to provide a prefabricated thin pattern of the lingual portion of each different tooth with each pattern having a lingual surface, a mesial surface and distal surface corresponding with its respective tooth with each molar pattern also having an occlusal surface corresponding with its respective tooth which patterns can be easily and quickly modified by a technician of moderate skill and the resultant modified pattern remains in its modified form.

Another object of the invention is as in the preceding paragraph and to provide the prefabricated pattern in plastic or gold.

Another object is to provide a method or technique which uses the pattern or patterns for more quickly and inexpensively producing a dental restoration which also does not require a highly skilled technician.

Other objects of the invention will be more apparent from the following description when taken in connection with the accompanying drawings illustrating a preferred form of the invention in which:

FIG. 1 is a top view of a pattern for a molar;

FIG. 2 is a front view of the pattern as viewed from line 2-2 of FIG. 1;

FIG. 3 is a sectional view of the pattern of FIG. 1 taken on line 3-3 of FIG. 1;

FIG. 4 is a front view of the pattern of FIG. 1 with a lower slot;

FIG. 5 is a top view of the pattern for an incisor tooth;

FIG. 6 is a front view of the pattern of FIG. 5 as viewed from line 6-6 of FIG. 5;

FIG. 7 is a section taken on line 7-7 of FIG. 5;

FIG. 8 is an enlarged perspective view of a pattern mounted on a tooth stub form with coping and wires.

The dental pattern is prefabricated and thin walled. A pattern is provided for at least each different tooth in the mouth. Each molar pattern 10, one being illustrated in FIGS. 1-4, has outer surfaces conforming with the lingual surfaces 11, mesial and distal surfaces 12, and occlusal surface 13 of the respective molar which is to be replaced or capped, that is the molar pattern has its exterior surfaces conforming with that of its respective natural tooth. The pattern for each incisor tooth, one being illustrated in FIGS. 5-7, has a lingual surface 17, and distal and mesial surfaces 18 conforming to a natural tooth. The bottom or gingival portion of each pattern is semicircular or generally semicircular or oval and can be shaped to conform with the tooth stub to receive a restoration or with the shape of a coping which has been prepared to fit over a tooth stub. The pattern has an incisal or front edge 19 and a gingival edge 20. The portion of the pattern adjacent to the gingival edge provides a gingival portion.

The pattern has slot means, a single central slot being shown, extending from the incisal or front edge. For a molar

pattern, the slot 21 preferably extends roughly the full depth of the occlusal surface 13 and may extend downwardly into the lingual wall. In any event it is about one-half of the combined dimension of the occlusal and lingual walls. For an incisor pattern 16 the slot 22 extends roughly about one-half of the height of the pattern. There is considerable latitude in the length of the slot although the slot should not be so long that some of the bottom of the pattern can not be trimmed off without unduly weakening the connection between the halves of the pattern. Such trimming may be required such as for a short tooth or a short restoration. The slot is relatively substantial width so that the width of the pattern can be narrowed sufficiently by pressing the edges together to partially or even fully close the slot the required amount to fit the prefabricated pattern into the space between the sides of the abutting or adjacent teeth. The slot should be wide enough to enable narrowing the pattern for any space between abutting teeth. The pattern can be spread to widen the slot to adjust the pattern to conform it with the space between the adjacent teeth to properly close the space therebetween. The slot desirably is wedge-shaped or tapers. Preferably the bottom of the slot is widened on each side, shown as a round hole, to increase the ability of the pattern to be modified as described for the full length of the slot.

A pattern made of plastic should have a low melting point or vaporization temperature so that it will burn out of the tooth or bridge mold without residue when the mold is heated for subsequently casting of the frame of the restoration. When the pattern is made of gold it remains in the mold after the wax is burned out and forms a part of or the surface of the lingual portion of the finished frame and restoration. The gold used as a pattern material should have a composition as will be defined below.

If desired the bottom portion of the pattern may also have slot means, one slot 23, FIG. 4, being shown, so that the gingival portion may be more extensively or more easily modified to fit a coping or the stub of a tooth to be capped than is afforded by a pattern without this additional slot.

A pattern made of plastic having the characteristics described above is also one which can be burned out of the mold cavity in the usual temperature range to which the mold is subjected in order to melt or vaporize and thereby eliminate the pattern and wax in this manner from the mold cavity. There are many plastics having this characteristic, examples of which are polyvinyl acetate, polyethylene and copolymers thereof. For a plastic pattern, greater latitude as to thickness of the pattern wall is permissible and a thickness of approximately 13 to 16 thousandths of an inch is satisfactory so long as it retains its ability to be closed or spread to fit the space between adjacent teeth and also for occlusion and contact for a posterior tooth. The plastic pattern should have the characteristic of (1) softness or pliability so that it can be adapted or modified by the technician and (2) retentivity so that it retains its modified shape. Shore A hardness of about 70 will have the necessary characteristics described above.

The pattern may also be made of gold which again should have the characteristic (1) softness or pliability to be shaped, that is narrowed, or widened, occlusal and contact or otherwise modified and (2) of retaining its modified shape or form. For a gold pattern a thickness of about six- to eight-thousandths of an inch is desirable. The softness of a pure gold has the proper characteristic as to softness. Since gold is expensive a minimum thickness is economical. The interior of the gold pattern is backed by wax such as 26 gage. The resultant combined thickness of .006 of the prefabricated pattern and the 26 gage wax replaced by gold in the casting process, provides a frame which is amply strong for dental purposes. In addition, the gold pattern is not burned out of the mold but is retained therein to form a part of the finished lingual portion of the frame of the restoration. It is for this reason that when the pattern material is gold, it should be of a composition which does not oxidize. The reason for this is that if a gold which oxidizes is used, the oxidation forms a thin inner

coating into which additional gold will not adhere when the frame or crown is cast. Preferably the gold of the pattern and the cast gold has the same color. Both the plastic and gold material of the pattern will accommodate the occlusion of the posteriors by pressure or biting.

Preferably the pattern has a plurality of wire holes 27 in the upper portion thereof so that the dental technician may project wires therethrough, such as of metal, which do not burn out or of plastic which do burn out. The metal wires remain within the mold to form a part of the frame and a more positive anchorage means for the facing or veneer material subsequently applied to the buccal or labial frame to complete the restoration. When plastic wire is used the cast gold fills the space formed by the burned out plastic wires to provide the retention for the veneer.

Frequently, a patient is not concerned with having a molar tooth restored with a porcelain or plastic facing. In this event, the pattern is used as described but the pattern is waxed fully and the buccal portion is carved to its desired anatomy, invested, burned out and cast and in this manner a full cast crown is obtained. Similarly, the gold pattern may be used, waxed and carved to the shape of a complete molar or molars to form a full crown. This crown is then invested, the wax burned out leaving the gold pattern within the mold cavity. The crown is then cast and the pattern or patterns become a part of the finished restoration.

Two or more patterns may be assembled together to form a bridge of a plurality of teeth. Such bridges are formed using the usual technique known to the dental profession.

The invention is also directed to a method of making a dental frame or crown using the prefabricated pattern or patterns as described. The invention also includes a method of making a dental mold by investing the prepared frame, and burning out the frame including the plastic pattern. In practicing the method, the pattern described is used and its internal cavity is prepared with wax and shaped to the desired frame after which the slot means is filled with wax to form a completed frame. The waxing may include waxing at the gingival edge to lengthen the frame. A simple way to form an anchorage for the veneer is to project wires 29 through the holes 27 so that this step is preferably included. The frame is invested in known manner including the plastic pattern if used which is burned out to provide a mold cavity for the frame. If the prefabricated pattern is of gold it is not burned out but remains in the mold cavity after which the frame mold cavity is filled with casting gold in known manner to provide a cast frame or a complete crown or restoration. The gold pattern becomes a part of the completed frame or restoration.

In making a frame construction in most cases, a coping 31

of thin plastic is shaped to the stub S of the tooth to be capped, an impression of which is provided by the dentist. The gingival portion of the pattern is then fitted to this coping so that the coping becomes a part of the frame construction. The wires 29 about the coping. If metal wires are used, these wires remain to form the retention means for the cast frame. If the wires are plastic, the plastic wire burns out leaving holes in the investing mold which are filled with casting metal when the frame is cast to form the retention means for the cast frame. The coping burns out when the mold is heated.

This invention is presented to fill a need for improvements in a Prefabricated Dental Pattern having Adjusting Slot Means. It is understood that various modifications in structure, as well as changes in mode of operation, assembly, and manner of use, may and often do occur to those skilled in the art, especially after benefiting from the teachings of an invention. This disclosure illustrates the preferred means of embodying the invention is useful form.

We claim:

1. A prefabricated dental form comprising a thin pattern having an exterior surface conforming to the configuration of the lingual portion of a tooth including the mesial and distal surfaces for an incisor and the mesial, distal and occlusal surfaces for a molar, slot means including at least one slot extending from the incisal edge to roughly one-half of the dimension of the pattern, the slot having a substantial width to permit narrowing or widening of the pattern to accommodate the pattern for tooth spacing, the material of the pattern being relatively soft so that it can be modified as to width and form and being of sufficient retentiveness so that the pattern will remain in its modified form, and the pattern being relatively thin having a thickness roughly of about six-thousandths of an inch.

2. A prefabricated dental form as in claim 1 in which the slot means is a single centrally located slot.

3. A prefabricated dental pattern as in claim 1 in which there is a short widening of the slot at the bottom of the slot and on each side thereof.

4. A prefabricated dental pattern as in claim 1 and including a plurality of holes through the pattern of a diameter to receive a wire and located in the region on each side of the slot so that anchorage is provided for a facing.

5. A prefabricated dental pattern as in claim 1 in which the material of the pattern is a plastic having about 70 Shore A hardness and having a burnout temperature such that it will be eliminated when the mold is heated.

6. A prefabricated dental pattern as in claim 1 in which the material of the pattern is dental gold and having a nonoxidizing characteristic.

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