

June 23, 1964

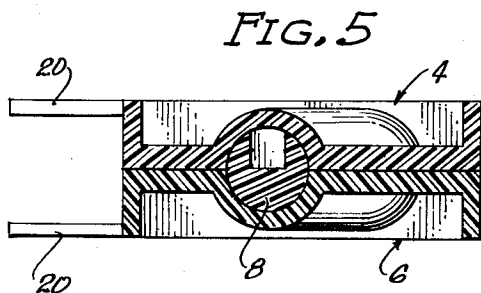
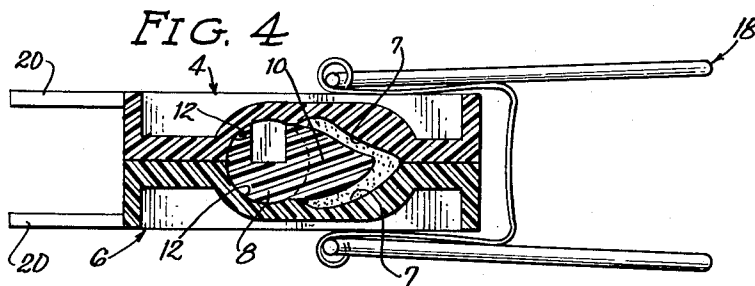
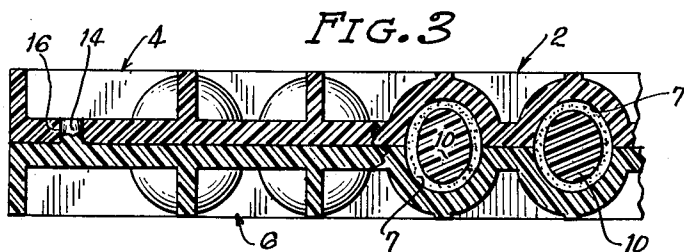
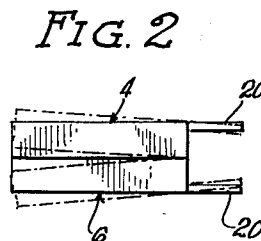
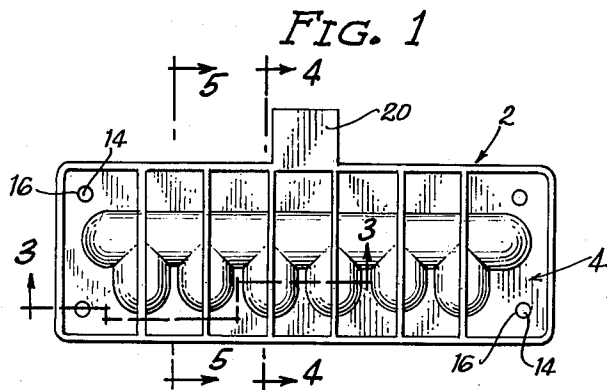
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3,137,894

APPARATUS FOR THE PRODUCTION OF CROWNS

Filed Jan. 13, 1961

2 Sheets-Sheet 1



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APPARATUS FOR THE PRODUCTION OF CROWNS

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2 Sheets-Sheet 2

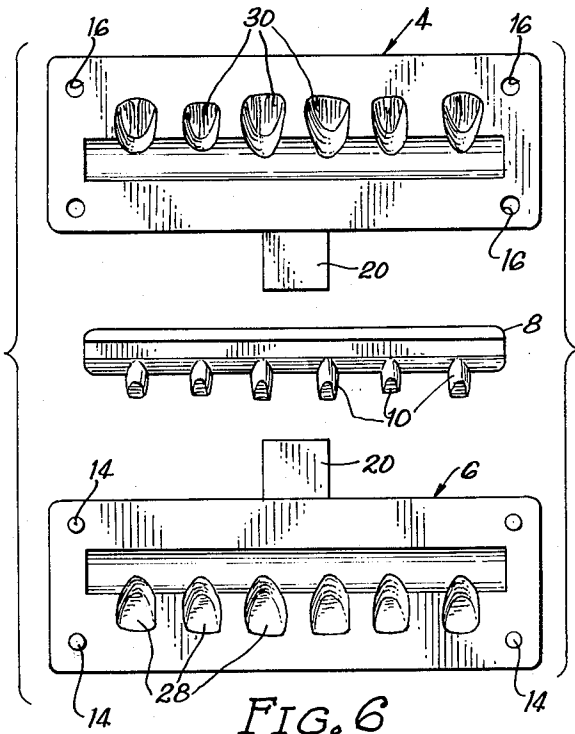


FIG. 6

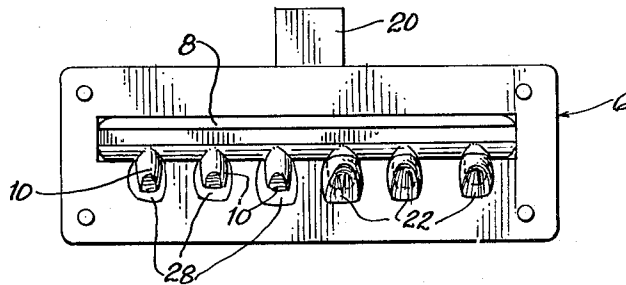


FIG. 7

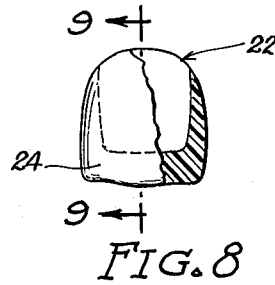


FIG. 8

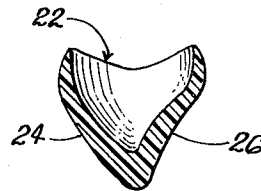


FIG. 9

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3,137,894

APPARATUS FOR THE PRODUCTION OF CROWNS
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 cago, Ill., a corporation of Illinois
 Filed Jan. 13, 1961, Ser. No. 82,611
 4 Claims. (Cl. 18—5.7)

This invention relates to the production of dental crown forms and permanent jackets for use in dental operations. The invention relates more particularly to a process and apparatus for the production of temporary and permanent jacket crowns in an exceedingly simple manner which is economical and quick. The invention is further adapted for a substantial number of supplementary uses including various methods of producing bridge facings.

In the past, the production of dental crowns and jackets has been particularly laborious, time-consuming, and expensive. Prior methods have included the steps of making an impression in the dentist's office while the patient is present. The impression is then sent to a laboratory where a pattern is made therefrom and a mold is formed from the pattern. Finally, the jacket or crown is produced with this mold.

It is therefore an object of this invention to provide a process and apparatus for the production of dental crowns and temporary and permanent jackets which is substantially less time-consuming and more economically feasible than prior methods.

It is a further object of this invention to eliminate the several steps previously necessary in the production of dental crowns and jackets, including the steps of providing separate patterns and molds for each operation of this type.

It is an additional object of this invention to provide a process and apparatus which is of such a simple nature that a dentist may produce dental crowns and jackets in his own office while the patient waits in the chair.

These and other objects of this invention will appear hereinafter and for purposes of illustration, but not of limitation, specific embodiments of this invention are shown in the accompanying drawings, in which—

FIGURE 1 is a top plan view of the molding device of this invention;

FIGURE 2 is a side elevation view of the device shown in FIGURE 1;

FIGURE 3 is a sectional view taken about the line 3—3 in FIGURE 1;

FIGURE 4 is a sectional view taken about the line 4—4 in FIGURE 1;

FIGURE 5 is a sectional view taken about the line 5—5 in FIGURE 1;

FIGURE 6 is a top plan view of the split mold of this invention, arranged in a disassembled fashion;

FIGURE 7 is a top plan view of the front half of the split mold of this invention, with a novel core means inserted therein;

FIGURE 8 is a detail view, partly in section, of a dental crown produced in accordance with the inventive process; and

FIGURE 9 is a sectional view of a dental crown taken about the line 9—9 of FIGURE 8.

The instant invention consists broadly of a novel permanent molding apparatus, the use of which eliminates the need for taking impressions of the patient's tooth, forming a separate pattern from this impression, and constructing a separate mold from the pattern produced. The apparatus of this invention is peculiarly adaptable for particular novel process steps, enabling the attainment of the highly advantageous results of this invention.

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Referring to the drawings, there is shown a mold 2 formed of split mold sections 4 and 6 recessed at a plurality of positions to form cavities 7. A base member 8 has located thereon a plurality of core members 10 and is adapted to be inserted in the respective troughs 12 located in the mold sections 4 and 6. Dowel pins 14 interfit within the holes 16 when the mold sections 4 and 6 are assembled.

A clamp 18, which may be any conventional clamping means, for example, an ordinary clipboard clamp, is utilized as shown in FIGURE 4 to provide a pressure fit of the mold sections 4 and 6. Releasing means 20 enable parting of the mold sections 4 and 6 after the insertion of molding material in an exceedingly simple fashion, as is suggested by the dotted line portions shown in FIGURE 2.

The crowns 22 which are produced in accordance with this invention are comprised of labial surfaces 24 and lingual surfaces 26 which result from the anatomically contoured labial and lingual mold-forming surfaces in the mold sections 4 and 6. The labial and lingual mold-forming surfaces are designated by the numerals 28 and 30, respectively. The cored portions of the crowns shown in FIGURES 8 and 9 correspond to the cores 10 located within the assembled molds 2.

All the materials which are employed in producing the dental crowns in accordance with this invention are conventional and include self-curing plastic powder and liquid for making temporary jacket crowns, highly cross-linked, color-stable, self-curing plastic powder and liquid of high strength for the formation of permanent jacket crowns, and enamel overlays conventionally employed for permanent crowns.

The molds 2 are expediently provided in a series of sizes which may be designated as small, medium, and large sizes. When it is desired to prepare a crown, the dentist or his technician will merely select the particular size which is closest to that necessary for the particular operation.

In the making of a temporary crown form, once the desired size is selected a particular shade desired in the final crown will then be provided from the available conventional plastic powders. The powder is then mixed with conventional liquids and once the resulting soft dough consistency in the mixture is reached, the mixture will be packed into the lingual portion 30 of the mold section 4, with the related core 10 in place. Moist cellophane is then placed over the filled portion of the mold section 4, followed by placing of the mold section 6 with the corresponding labial-forming surface 28 onto the mold section 4 with hand pressure. The mold sections are then separated, the cellophane removed, and a blunt instrument employed to trim away excess flash from the mesial, distal, and incisal areas within the mold. The mold sections 4 and 6 are then reassembled, with or without the moist cellophane separator, and the clamping means 18 enclosed thereabout. The conventional materials employed ordinarily harden within 10–12 minutes, and upon removal from the mold the crown is ready for insertion into the patient's mouth, there being only the ordinary adjustment and fitting steps to follow.

In the preparation of permanent jacket crowns, essentially the same initial procedure is followed. However, a hard plastic mixture is employed in place of the flexible mixtures ordinarily used for temporary jacket crowns. In addition, the initial crown form is not permitted to completely harden after the flash has been cleared away and the crown reinserted in the mold. Rather, the mold sections 4 and 6 are subjected only to hand pressure upon reinsertion of the crown in order to more accurately form the outline of the crown. The mold sections are then

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separated and any additional excess material which may have formed after the second hand pressure step will be trimmed away. Then, in order to enable the addition of an enamel overlay, a spatula will be employed to trim away about 1 mm. from the incisal area of the crown. Conventional practice is to slope the trimming back toward the middle one-third of the tooth and to contour in at the mesial-distal area for greater naturalness. The trimmed crown will then be reinserted into the mold section 4 and an enamel overlay mixture inserted to fill up the trimmed-away portion. The mold section 6, with its corresponding labial-forming surface 28, is then inserted upon the mold section 4 with hand pressure. The molds are then separated, flash is trimmed away, and finally the mold sections are clamped together with the spring clamp 18 for approximately 20 minutes, which is the conventional hardening time for this type of material.

In order to seat the permanent crown firmly in the patient's mouth, a mixture of the permanent plastic material will be placed within the hollow portion of the crown 22, thus enabling exact correspondence with the tooth portion in the patient's mouth. After this material hardens, the conventional cementing of the crown to the tooth portion in the patient's mouth will follow.

The molds of this invention are particularly adaptable for the production of bridge facings. In this process, the lingual half of the crown, which is formed in the previously described manner, will be cut away and fitted to the desired need. Further, such facings may be produced by using the labial section of the mold only. As will be obvious to the skilled practitioner, the molds are equally well adapted for use in replacing broken facings, in producing temporary splints, for providing wax teeth patterns for bridge work, and for replacing broken teeth on a denture.

It will be understood that various modifications in the above-disclosed process and apparatus may be effected without departing from the spirit of this invention, particularly as defined in the following claims.

We claim:

1. A dental crown-molding apparatus adapted to produce crowns corresponding to a predetermined tooth shape and including a plurality of permanent molds, said apparatus further comprising first and second halves, elongated first and second troughs formed in each of said halves being adapted to form a hollow space in said apparatus when said halves are assembled, recessed portions in said first half extending perpendicularly from said first trough and having anatomically shaped contours corresponding to the lingual contour of said teeth, recessed portions in said second half extending perpendicularly from said second trough and having anatomically shaped contours corresponding to the labial contour of said teeth, said recessed portions forming said plurality of molds when said halves are assembled, core elements adapted

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for insertion into each of said permanent molds when said halves are assembled, and a base member securedly holding each of said core members, said base member being releasably fitted within said hollow space when said halves are assembled.

2. The permanent molding apparatus according to claim 1, further including means to clamp said halves tightly in their assembled condition, and laterally extending releasing means positioned on each of said halves adapted to permit ready removal of said crowns after the molding operation.

3. A dental crown-molding apparatus adapted to produce crowns corresponding to a predetermined tooth shape and including a plurality of permanent molds, said apparatus further comprising first and second halves, elongated first and second troughs formed in each of said halves being adapted to form a hollow space in said apparatus when said halves are assembled, recessed portions in said first half extending perpendicularly from said first trough and having anatomically shaped contours corresponding to the lingual contour of said teeth, recessed portions in said second half extending perpendicularly from said second trough and having anatomically shaped contours corresponding to the labial contour of said teeth, said recessed portions forming said plurality of molds when said halves are assembled, an elongated base member dimensioned to be snugly received within said hollow space when said halves are assembled, a plurality of core elements integrally formed on said base member and extending perpendicularly therefrom, said core elements being adapted to be received within said molds with the outer surfaces of said core elements maintained in spaced-apart relationship with respect to the inner surfaces of said molds when said halves are assembled and when said base member is received within said hollow space.

4. The permanent molding apparatus according to claim 3 further including means to clamp said halves tightly together in their assembled condition, and laterally extending releasing means formed in each of said halves whereby said halves can be separated by pressing on said releasing means when said clamping means have been removed.

References Cited in the file of this patent

UNITED STATES PATENTS

713,330	Murray	Nov. 11, 1902
1,408,533	Pullen	Mar. 7, 1922
2,409,783	Moskey	Oct. 22, 1946
2,434,416	Kohn et al.	Jan. 13, 1948
2,678,470	Slack	May 18, 1954
2,703,435	Watson	Mar. 8, 1955
2,846,725	Tryfus	Aug. 12, 1958
3,012,287	Tucker	Dec. 12, 1961