E. O. LOTHAMER.

DENTAL SWAGING MACHINE.

APPLICATION FILED MAR. 10, 1909.

950,294. Patented Feb. 22, 1910.

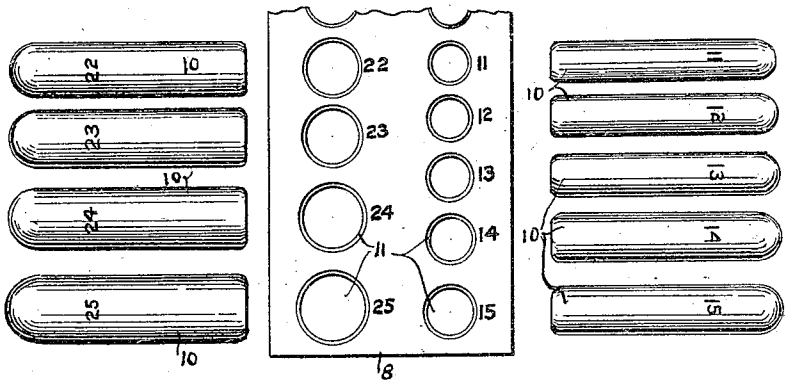

Fig. 1.

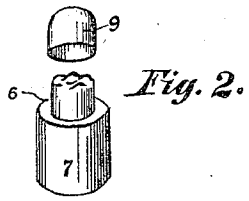

Fig. 2.

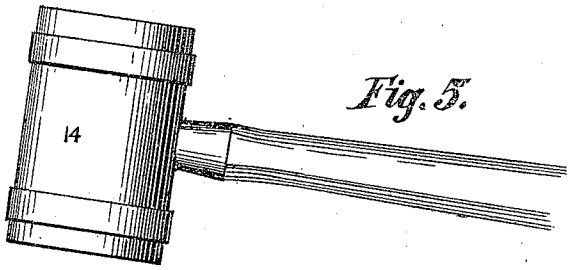

Fig. 5.

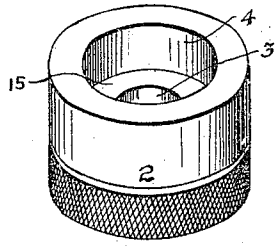

Fig. 4.

Fig. 3.

Witnesses

Jos. J. Hosler.

Sylvia Boron.

Inventor

Edward O. Lothamer

By Bond + Miller

Attorneys

UNITED STATES PATENT OFFICE.

EDWARD O. LOTHAMER, OF CANTON, OHIO.

DENTAL SWAGING-MACHINE.

950,294. Specification of Letters Patent. Patented Feb. 22, 1910.

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To all whom it may concern:

Be it known that I, EDWARD O. LOTHAMER, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Dental Swaging-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in duplicating and swaging devices which I employ particularly for crown work, re-producing artificial tooth-crowns the exact counterpart of natural teeth.

Some of the objects of my invention are to produce and duplicate from sheets of gold or other suitable material the exact counterparts of the crown of natural teeth.

The devices I employ in connection with a pliable rubber head or block which rubber head or block is formed of unvulcanized dental rubber.

I attain some of the objects referred to by the devices shown in conjunction with the pliable rubber as illustrated in the drawing, in which—

Figure 1 is a view showing a portion of a swaging plate and a number of forming or swaging dies. Fig. 2 is a view showing one of the tooth dies together with its base and also showing a blank crown. Fig. 3 is a vertical section of the tooth forming die, its base, the pliable crown forming block and cylinder, also showing the plunger partly in section. Fig. 4 is a detached view of the tooth die holding base. Fig. 5 is a side view of the mallet.

Similar numerals of reference indicate corresponding parts in all the figures of the drawing.

In the accompanying drawing, 1 represents an anvil upon which the tooth die holding base is to be placed; but it will be understood that this base may be placed upon any solid object and the same purpose accomplished. The base 2 is provided with the aperture 3 above which aperture is located a chamber 4, said chamber being formed of a diameter greater than the diameter of the aperture 3 and is so formed for the purpose hereinafter described.

The hollow cylinder 5 is open at each of its ends and is formed of such a size that its bottom or lower end can be placed in the top of the base 2 as illustrated in Fig. 3. It will be understood that the extreme diameter of the hollow cylinder 5 should be a trifle less than the extreme diameter of the chamber 4 so that the cylinder 5 can be easily placed in position and when placed in position it will always be in the same relative position regardless of the shape of the crown forming die 6. It is well understood that the shape and size of tooth crowns vary in accordance with the shape and size of the different kinds of natural teeth and hence it is of the utmost importance that the cylinder 5 always assumes the same position with reference to the tooth die 6. Each tooth die is provided with a support, such as 7, but each base is of the same shape and size so that the tooth die 6 will always assume the same position when the support 7 and the die 6 are placed in the position illustrated in Fig. 3. It will be understood that the die 6 should be formed integral with the support 7, or may be made separate and securely attached in any convenient and well known manner, but whether made integral or made separate and attached, the tooth die should always be in the same position with reference to the support 7.

It will be understood that a common and well known draw plate 8 must necessarily be employed to originally form from flat sheets of gold the formed or blank thimbles 9 which thimbles are formed by means of the punches 10. The draw plate is provided with a series of apertures 11, which apertures should be properly numbered and the punch for any particular aperture numbered to correspond with the number of the aperture so that proper sized blank thimbles can be formed. The illustration in Fig. 1 is a representation of the tools designed for use in carrying out the detailed working of the invention. After the thimbles 9 have been properly formed the particular thimble is placed upon the particular tooth die 6 after which the thimble and die together are placed in the position illustrated in Fig. 3 or the thimble may be placed in position after the tooth-die and its base have been placed in the position illustrated in Fig. 3 as it is immaterial as to the time when the thimble is placed in position with reference

to placing the tooth-die and its base in position. The elastic head or block 12 is placed in the hollow cylinder 5 after which said hollow cylinder is placed in the position illustrated in Fig. 3, thereby, properly locating the hollow cylinder with reference to the tooth-die 6. After the hollow cylinder 5 and the elastic block or head 12 have each been placed in proper position the driving bar or plunger 13 is placed in position so that its bottom or lower end will come upon the top of the elastic block 12. It will be understood that by driving the elastic block down by the driving downward of the plunger 13 by means of the mallet 14 or its equivalent the thimble will be brought into substantially the shape of the tooth-die 6; that is to say the top of the thimble will be shaped to correspond with the top of the tooth-die 6 after which the cylinder 5 together with the different parts belonging thereto, is moved from the base 2 and the formed tooth crown together with the tooth die can be removed from the base 2.

It is of importance in the formation of tooth crowns that they conform with considerable exactness to the form of the tooth upon which any given crown is to be placed, and that by providing means for locating each tooth-die regardless of its particular shape in the same relative position, the elastic block or head will have substantially the same force upon each and every crown so that there will be very little variance in the formation of the crowns.

For the purpose of checking the tendency of the plastic material from moving upward between the surfaces of the cylinder 5 and the plunger or driving bar 14, the bottom or lower end of said plunger is cup shaped or concave as best illustrated in Fig. 3. It will be understood that by concaving the bottom of the plunger the elastic material will be driven downward and upon the tooth-die 6 with greater exactness than could be done with a straight ended plunger. It is of importance that the elastic material be driven upon the tooth-die 6 with exactness and by concaving the bottom end of the plunger the elastic head will be compressed by the downward movement of the plunger.

It will be understood that by forming a chamber in the upper part of the base 2 larger in diameter than the opening in which the tooth-die support is located and forming the tooth-die of less diameter than its support, an annular flange is produced, which annular flange forms a support, and stops the downward movement of the elastic block 12 and by continued striking upon the plunger said elastic block is so confined that it will be forced upon the outer surface of the cap in such a manner that the cap can be brought to proper shape and such shape that it will conform with the shape of the tooth-die 6, regardless of the particular shape or size of any particular tooth-die.

In use it is necessary to provide sixteen or more tooth dies 6 so that the crown caps can be formed upon the various dies to fit various teeth such as upper and lower molars and bicuspids, rights and lefts. It will also be understood that when a blank thimble is formed by the draw plate and its proper die the thimble formed by the use of any particular sized die and aperture must be placed upon the corresponding sized tooth die 6 and in order that no mistake be made each tooth die should be given a size number corresponding with the size number of the aperture and the die for forming the blank crown caps; that is to say if the die 15 is used to form a crown cap in connection with the apertures 15 in the draw plate 8 the tooth die 6 should be given the same size number that is to say, the tooth die should be numbered 15, the aperture should be numbered 15 and the die should be numbered 15 and different size numbering should be carried out uniformly for all the various apertures and dies used in connection with the manufacture of blank crown caps or thimbles.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination of a base provided with an aperture in its lower portion and a chamber in its upper portion, said chamber formed of greater diameter than the diameter of the aperture, an annular flange located at the juncture of the aperture and chamber, an open ended cylinder formed of a diameter corresponding substantially with the diameter of the chamber in the upper portion of the base, a tooth die provided with a support portion adapted to fit the aperture in the lower portion of the base, a tooth die extended into the chamber of the upper portion of the base, an elastic block adapted to be located in the open ended cylinder and a plunger adapted to fit the open ended cylinder and to be reciprocated in said cylinder, substantially as and for the purpose specified.

2. In a device of the character described, the combination of a base provided with an aperture in its lower portion and a chamber in its upper portion, said chamber formed of greater diameter than the diameter of the aperture, an annular flange located at the juncture of the aperture and a chamber, an open ended cylinder formed of a diameter corresponding substantially with the diameter of the chamber in the upper portion of the base, a tooth die provided with a support portion adapted to fit the aperture in the lower portion of the base, a tooth die ex-

tended into the chamber of the upper portion of the base, an elastic block adapted to be located in the open ended cylinder and a plunger provided with a concave lower end, said plunger adapted to fit the open ended cylinder and to be reciprocated in said cylinder, substantially as and for the purpose specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

EDWARD O. LOTHAMER.

Witnesses:
F. W. BOND,
NILES A. SPONSELLER.