(No Model.) 3 Sheets—Sheet 1.

R. G. STANBROUGH.

DENTAL MACHINE FOR GRINDING ARTIFICIAL TOOTH CROWNS.

No. 490,930. Patented Jan. 31, 1893.

Fig. 2.

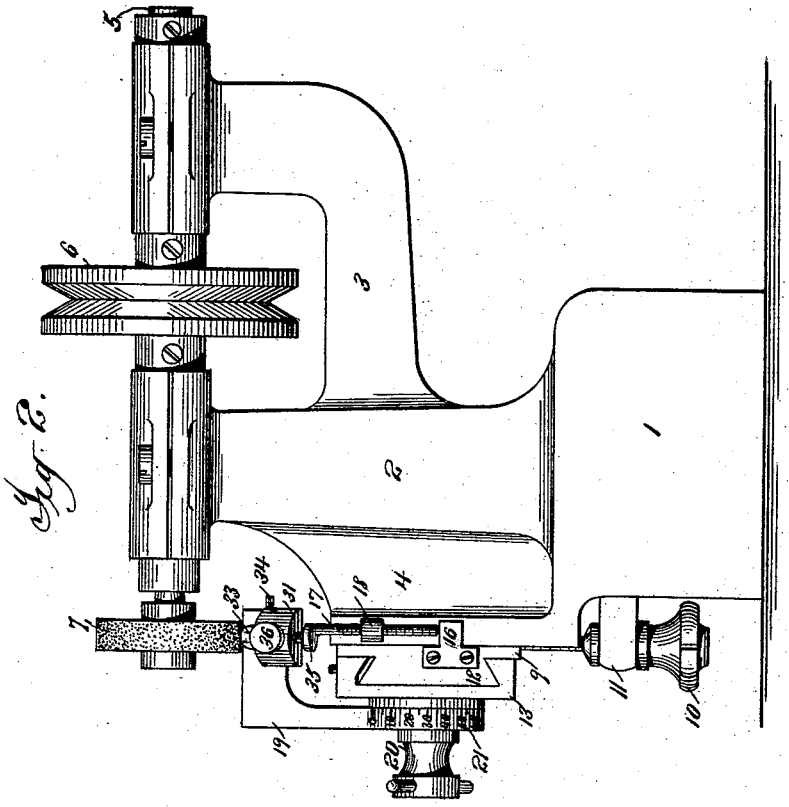

Fig. 1.

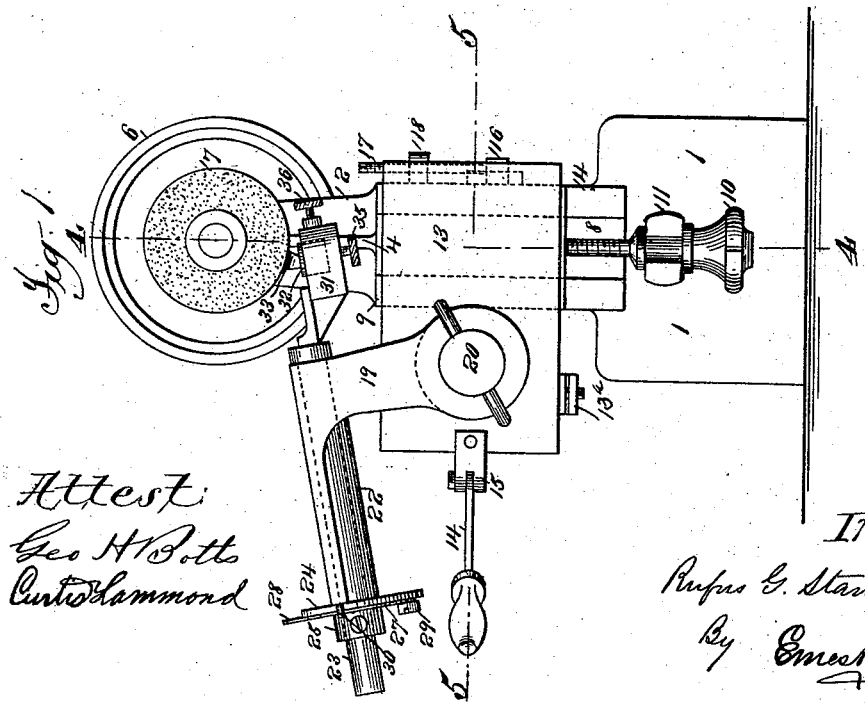

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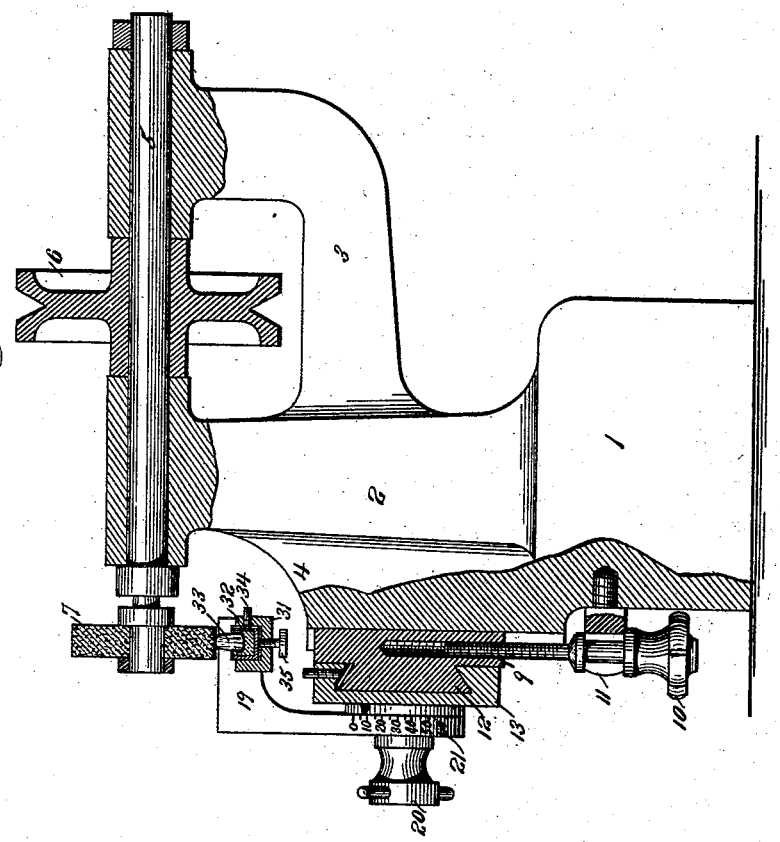
Fig. 4.



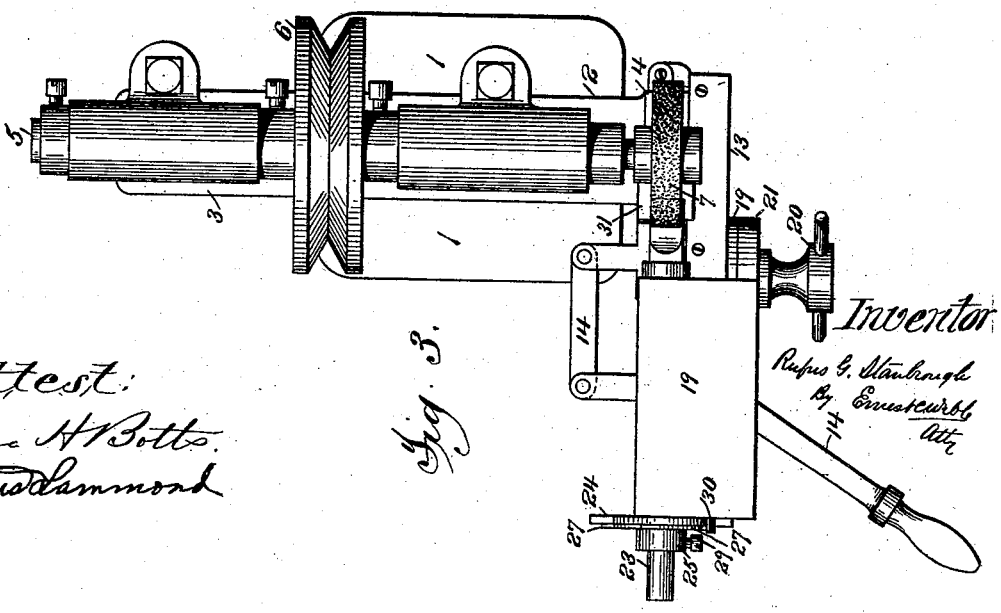


Fig. 3.

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Fig. 6.

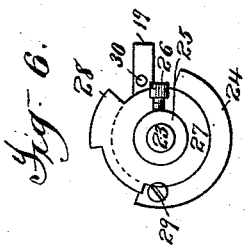
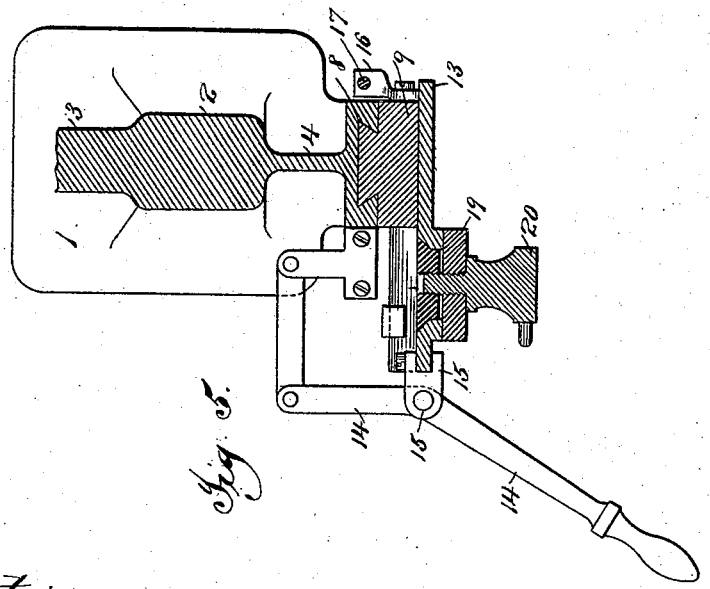


Fig. 9.

Fig. 8.

Fig. 7.

Fig. 5.



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UNITED STATES PATENT OFFICE.

RUFUS G. STANBROUGH, OF NEW YORK, N. Y.

DENTAL MACHINE FOR GRINDING ARTIFICIAL TOOTH-CROWNS.

SPECIFICATION forming part of Letters Patent No. 490,930, dated January 31, 1893.

Application filed March 15, 1892. Serial No. 425,052. (No model.)

To all whom it may concern:

Be it known that I, RUFUS G. STANBROUGH, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented a certain new and Improved Dental Machine for Grinding Artificial Tooth-Crowns, of which the following is a specification.

This invention relates to certain new and improved machinery for grinding the attaching ends of artificial tooth crowns and imparting to the same a predetermined lateral curve to enable such crowns to fit neatly and accurately in the natural root portions previously prepared to receive them. Also to impart to such artificial crowns a predetermined bevel or incline so that the artificial crowns may have the proper pitch and projections to maintain the continuity and regularity of the dental arch, and also preserve the proper and natural position of the anterior and posterior gum lines, which from being equal and parallel at the molars, diverge toward the crown of the arch where the posterior gum line is considerably lower than the anterior.

As the great majority of dentures are similar, or vary but little in pitch, it is possible for a number of artificial crowns to be ground to a certain fixed lateral curve, and to bevel or incline the attaching end of such crowns more or less and supply the crowns thus prepared to the dentists, who can select from their stock the crowns having the proper curve and bevel and attach the same to the natural tooth portions which have been previously prepared to receive them, for instance, in the manner and by the means described in Letters Patent of the United States, No. 468,992 for artificial teeth and No. 468,993 for dental tools granted to me, February 16, 1892, or by the means set forth in my pending application, Serial No. 418,696, filed January 20, 1892, and my invention is intended for use chiefly by manufacturers, who will make the artificial crowns of certain sizes and grind them to the standard curves and bevels, or will take the crowns as now supplied and grind them each with a fixed curve and bevel, giving to each crown of the same size and style a different bevel or curve so that in any given instance, the dentist may have on hand a crown of the size and having the exact curve and bevel to meet the exigencies of the operation.

To these ends my said invention consists in the details of construction and the arrangement and combination of parts, all as hereinafter more particularly described and pointed out in the claims, reference being had to the accompanying drawings illustrating my invention in the several figures of which like parts are similarly designated, and in which

Figure 1, is a front elevation of my improved machine; Fig. 2, is a side elevation; Fig. 3, is a top plan view; Fig. 4, is a view partly in longitudinal section on the line 4, 4, Fig. 1; Fig. 5, is a horizontal section on the line 5, 5, Fig. 1; Fig. 6, is an end view of the reciprocating shaft showing the stop device; and Figs. 7, 8 and 9, are perspective views of the artificial crown ring round, simply curved, and curved and beveled, respectively.

Before proceeding with a detailed description of my machine, I desire to state that it comprises a stationary standard or frame, a shaft capable of being rotated, and carrying a grinding wheel, a reciprocating portion, an oscillating portion, secured to the reciprocating portion, said oscillating portion being capable of adjustment in a vertical plane; means for vertically adjusting both the reciprocating and the oscillating portions and a lever for imparting a reciprocating movement as hereinafter more fully described.

The frame or standard of my machine comprises the base 1, having cast integral therewith the standard or upright 2, the arm 3, and the faced web 4. The standard 2 and the arm 3 afford journals for the shaft 5, upon which is keyed the pulley or belt wheel 6, and to this shaft is also attached the grinding wheel 7, of emery or other desired material, projecting over the faced web 4. The face of this web 4, is provided with a vertical dove-tailed recess 8, as shown particularly in Figs. 1 and 5, within which the block 9, working in the dove-tail recess in the face of web 4, the said block 9 is provided at its front with the horizontal flaring tenon 12, (Figs. 2 and 4,) over which slides the dove-tail plate 13, the vertical and horizontal parts just described being similar to the well-known slide rest, except

that they are in the one case perpendicular and in the other case horizontal. To this plate 13, I attach an adjustable stop 13ª, to limit the inward motion of the laid plate, and prevent injury being done to said plate and the mechanism hereinafter described or coming in contact with the grinding wheel 7. To this block 9, is attached the compound lever 14, which is also pivoted to the ears or lugs 15, of the sliding plate 13, and by means of said lever a reciprocating motion is imparted to the said plate.

To limit the vertical adjustment of block 9, I provide said block with the lug 16, striking against the set or regulating screw 17, passing through a lug 18 on the faced web 4.

To the reciprocating plate 13, I attach the right angled arm 19 capable of adjustment in a vertical plane by means of thumb nut 20, and the proper degree of adjustment may be readily ascertained by means of the scale 21, (Figs. 2 and 4) on the arm 19 and some appropriate marker such as a line on the plate 13.

The horizontal portion or angle of the arm 19 is provided with the tube or bearing 22, (Fig. 1.), through which works the reciprocating shaft 23. To one end of this shaft 23, I attach the plate 24, which, as shown particularly in Fig. 6, consists of a semi-circular portion and a hub 25, through which passes the shaft 23, to which the said plate is keyed or attached by the screw 26. Over the hub of the plate 24, is passed the ring 27 having the wings 28 thereon, the ring 27 being adjusted relatively to the plate 24 on the shaft 23, by the screw 29. Upon the horizontal portion of the arm 19 is arranged the pin 30, to limit the oscillating motion and it is obvious that this motion may be increased or diminished by moving the ring 25, and increasing or diminishing the distance between the wing 28, thereon, and the semi-circular plate 24.

At the opposite end of the shaft 23 is arranged the cup holder or socket 31, within which the cup 32 having the artificial tooth crown 33, securely embedded in cement therein, is held and secured. This holder or socket 31 is provided with a guide pin 34, engaging a groove in the cup 32, to insure accuracy and the cup is adjusted vertically by means of the screw 35 passing through the bottom of the holder 31 and the cup is secured in place by the screw 36.

The operation of my machine is as follows:—The tooth crown being usually received with the square end as shown in Fig. 7, is centrally placed in the cup 32, and secured therein by filling the cup with some suitable cement. The cup is then placed in the cup holder or socket 31, being accurately guided by the pin 34, and said holder, entering a groove in the cup so as to bring the artificial crown at right angles to the grinding wheel and the amount which is to be ground off the crown may be regulated by raising or lowering the cup through the medium of screw 35. The screw 36 is then turned to hold the cup and the crown securely in place. To give the artificial crown a greater or less slant or bevel, it is necessary that it should be brought in contact with the grinding wheel either with the axial line of said crown parallel with the vertical diameter of the grinding wheel, or at a greater or less angle thereto. For example, assuming that a considerable slant or bevel is to be imparted to the crown, the crown is tilted with its socket 31, shaft 23 and arm 19 by loosening thumb-nut 20 and adjusting said arm 19 to any desired angle indicated by the gage 21, and for instance to the position shown in Fig. 1. This operation of course, raises one side of the crown higher than the other, and its axial line is at a considerable angle to the vertical diameter of the grinding wheel, and when the crown is brought in contact with said wheel, as presently explained, the projecting side is ground away. By turning screw 10, and thereby raising or lowering block 9, which carries the other operating parts, and by adjusting the plates 24 and 27 on shaft 23, thereby limiting or extending the oscillating movements of said shaft as greater or less lateral curve may be imparted to the crown, as by the one adjustment more or less of the crown top is ground away, and by the latter the crown is turned to one side or the other to a greater or less extent. The grinding wheel 7 is given a rapid rotary motion and the compound lever 14 being pushed inwardly, carries with it plate 13 upon which is mounted the arm 19, the shaft 23, the cup holder or socket 31, cup 32 and crown 33 bringing said crown in its adjusted position against the face of said grinding wheel thereby grinding the crown to the bevel or incline previously determined and adjusted. At the same time the operator gives an oscillating motion to the shaft 23, said motion being adjustably limited in either direction by the stops 24 and 28 and the pin 30, and this oscillating movement of course partially rotates the cup holder 31, cup 32 and crown 33, bringing first one edge and then the other of said crown in contact with the grinding wheel 7, thereby curving or rounding off the edges at the same time that the bevel or incline is being imparted to the crown, and it will be found that but few backward and forward movements of the reciprocating portion of the machine, the oscillating shaft being rapidly turned in either direction on each stroke, will be sufficient to grind the crown to the contour and form desired.

It is obvious that in order to preserve the crown from being concaved and taking the form of the periphery of the grinding wheel, said crown must be moved slightly beyond the vertical diameter of the grinding wheel and that the entire top of the crown be passed beneath the lowest point of said grinding wheel. To preserve this motion from being too extended and bringing the arm 19 in contact with the grinding wheel, and thereby damaging the one or the other, the adjustable

stops 13ª is arranged at the plate 13, and by coming in contact with the block 9, limits this inward motion and obviates the danger of such injury to the machine. It will also be apparent that the greater it is desired to bevel, slant or incline the crown, the more must the arm 19 be tilted and the greater will be the number indicated by the scale 21.

What I claim as new and desire to secure by Letters Patent, is:—

1. A machine for grinding artificial tooth crowns, comprising a frame, a shaft journaled in said frame, carrying a grinding wheel, in combination with a right-angled arm, to the free end of which the crown is secured, and means for moving said arm to bring the crown into, and out of, contact with the face of the grinding wheel, substantially as described.

2. A machine for grinding artificial tooth crowns, comprising a frame, a shaft journaled in said frame and carrying a grinding wheel, in combination with a holder for the crown, vertically adjustable in the arc of a circle to vary the angle of the axial line of said crown to the vertical diameter of the grinding wheel and means for moving said crown in its adjusted position, into and out of contact with the face of the grinding wheel, substantially as described.

3. A machine for grinding artificial tooth crowns comprising a frame, a shaft journaled in said frame, and carrying a grinding wheel, in combination with an adjustable holder for the crown to vary the angle of the axial line of said crown to the vertical diameter of the grinding wheel, and means for imparting an oscillating movement to said crown holder and crown at right angles to the plane of its adjustment, and means for moving said crown into and out of contact with the face of the grinding wheel, substantially as described.

4. A machine for grinding artificial tooth crowns comprising a frame, a shaft journaled in said frame and carrying a grinding wheel, in combination with an adjustable holder for the crown to vary the angle of the axial line of said crown, with the vertical diameter of the grinding wheel, and means for imparting an oscillating motion to said crown holder and crown, at right angles to the plane of its adjustment, a stop to limit the oscillating movement, and means for moving said crown into and out of contact with the face of the grinding wheel, substantially as described.

5. A machine comprising a frame, a shaft journaled in said frame, and carrying a grinding wheel; a vertically recessed plate below said shaft and grinding wheel, in combination with a block having a vertical tenon arranged to slide in said recessed plate and capable of adjustment therein, and having also a horizontal tenon which engages a recess in a horizontally sliding plate, a crown holder pivotally secured to said plate, and crown holder, substantially as described.

6. In combination with a frame having a shaft journaled therein, and carrying a grinding wheel and a vertically recessed plate below said shaft; of a block having a vertical tenon and a horizontal tenon, the former engaging the recess in said vertical plate, and means for regulating the altitude of the block in said plate, and the horizontal tenon engaging a recess in a horizontally sliding plate, an adjustable crown holder secured to the latter plate, and a compound lever secured to the tenoned block, and pivoted to the horizontally sliding plate for imparting a reciprocating motion to said plate, and crown holder, substantially as described.

7. A machine comprising a base, a standard or upright an arm and a faced web provided with a vertical recess; a shaft journaled in the standard and arm, said shaft carrying a pulley and a grinding wheel; a block having on either side a vertical and a horizontal tenon, the former engaging the recess in the faced web and a set screw for regulating the altitude of the block in said web; and a recessed plate sliding over the horizontal tenon on said block and a compound lever secured to the tenoned block and pivoted to the sliding plate, in combination with a right angled arm secured to said sliding plate, by a regulating screw, the horizontal portion of said arm affording a bearing for a shaft, a crown holder or socket secured to one end of said shaft, and stops for limiting the movement of said shaft in either direction at the opposite end thereof, substantially as described.

8. In a machine for grinding artificial tooth crowns, an adjustable right angled arm, the upper portion of which affords a bearing for a shaft, a crown holder or socket secured to one end of said shaft, said socket being provided with a guide pin, an adjusting screw and a retaining screw, substantially as described.

9. In a machine for grinding artificial tooth crowns, an oscillating shaft in combination with a stop device comprising a semi-circular plate, screwed to said shaft, a ring having wings adjusted relatively to said plate and shaft, by a screw, and a suitable pin or projection, for engaging the semi-circular plate and ring, substantially as described.

Signed at New York, in the county of New York and State of New York, this 26th day of February, A. D. 1892.

RUFUS G. STANBROUGH.

Witnesses:
ERNEST C. WEBB,
CHARLES C. PETERS.