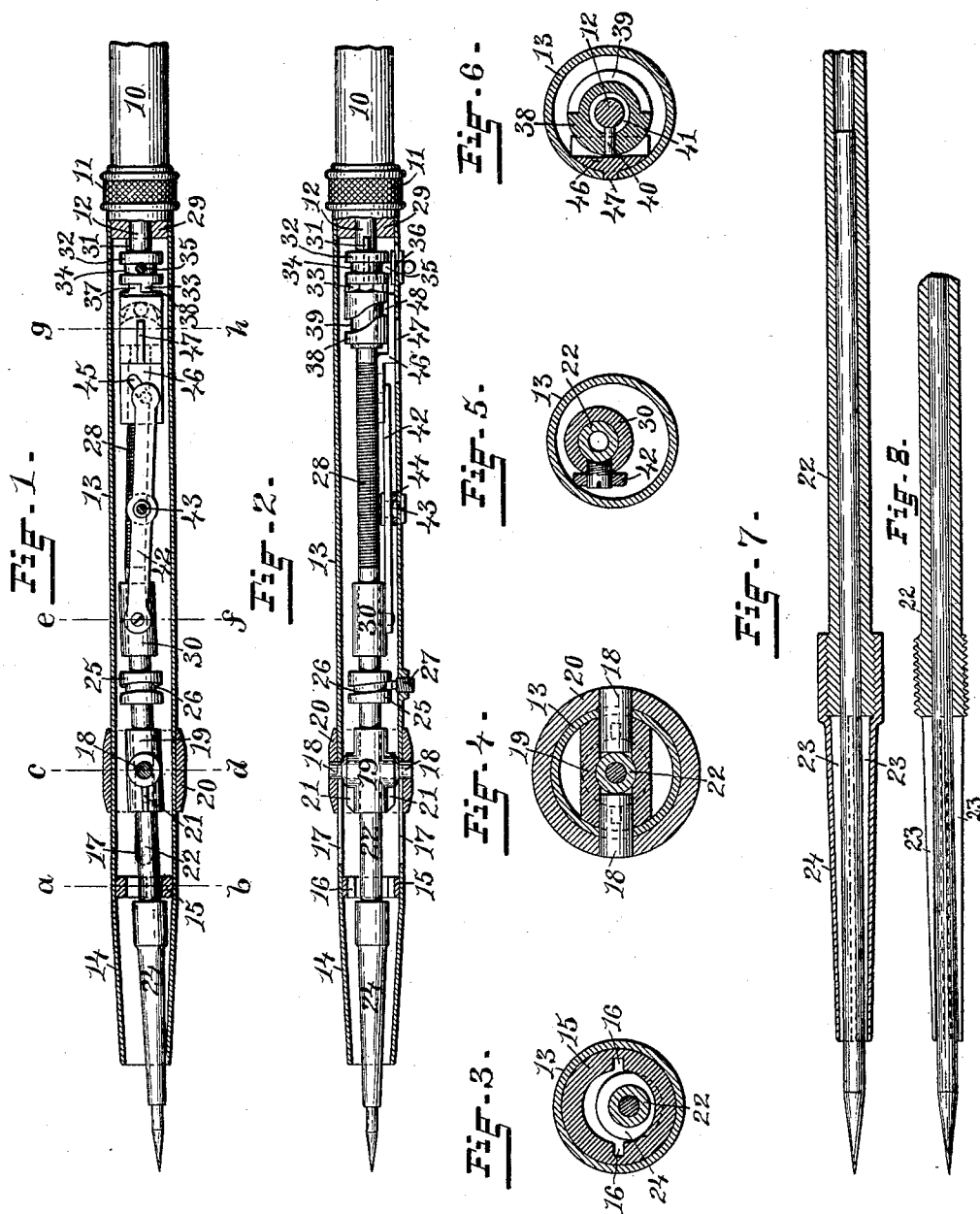


(No Model.)

A. J. BENNETT.
PHOTOGRAPHIC NEGATIVE RETOUCHER.

No. 488,705.

Patented Dec. 27, 1892.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC-NEGATIVE RETOUCHER.

SPECIFICATION forming part of Letters Patent No. 488,705, dated December 27, 1892.

Application filed March 8, 1892. Serial No. 424,220. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. BENNETT, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Mechanical Handpieces for Retouching Photographic Negatives; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in mechanical handpieces which are adapted to variously operate interchangeable tools secured thereto for the purpose of retouching photographic negatives.

The object of the invention is to produce a mechanical handpiece which shall be convenient in use and to which tools may be interchangeably secured.

The further object of the invention is to produce a mechanical handpiece in which a rotating mechanism may be adjusted to give a plunging, vibrating or circular motion to a tool, secured to the outer end thereof, to rapidly move the operating end of the tool over, or against, the surface of a photographic negative to increase, or decrease, the density of portions of the same while the hand-piece is slowly moved in the proper directions.

The invention consists in the peculiar construction of the case, and a rotatable, vibratile shaft properly supported therein, and the combination therewith of novel mechanism by which the rotatory motion of a power-shaft is conveyed to the first mentioned shaft to variously operate the same, as will be fully described hereinafter and pointed out in the claims.

Figure 1 represents a longitudinal, horizontal, sectional view of the improved device. Fig. 2 represents a longitudinal, sectional view of the same taken at right angle to Fig. 1. Fig. 3 represents an enlarged, cross-sectional view of the device, taken at a line *a-b*, Fig. 1. Fig. 4 represents an enlarged, cross-sectional view, taken at a line *c-d*, Fig. 1. Fig. 5 represents an enlarged, cross-sectional view, taken on a line *e-f*, Fig. 1. Fig. 6 represents an enlarged, cross-sectional view,

taken on a line *g-h*, Fig. 1. Fig. 7 represents an enlarged, longitudinal, sectional view of a portion of the tool-operating shaft, showing means for securing a pencil therein. Fig. 8 represents an enlarged longitudinal section of a portion of the tool-operating shaft, the cap being removed therefrom and the thin ends of the spring-arms being slightly separated to allow of the withdrawal of the lead.

Similar numbers of reference designate corresponding parts throughout.

In the drawings, 10 designates a rotatable power-shaft, which may be of any ordinary construction, but is preferably flexible, and is driven by any well-known motor,—11 indicating a sleeve carried on the shaft-casing, by which the connection between this flexible shaft 10 and the shaft 12 is covered.

The casing 13 is intended to be formed of a size convenient for holding in the hand, the forward end being tapered as shown at 14, and the outer surface is ornamented in any desirable manner. At the forward end of this casing is secured the guide-collar 15 provided with the slots 16, and extending backward from points near the location of this collar are the guide-slots 17—17 cut through the material of the casing, to guide the pivots 18—18 of the swivel journal-sleeve 19, which extend through these guide-slots and are secured in the sliding-sleeve 20 surrounding the casing,—the forward portion of the journal-sleeve 19 is provided with wings 21—21 which enter the slots 16 of the collar 15 when the journal-sleeve is advanced and prevent the vibration of the same.

Extending through the journal-sleeve 19, and rotatable therein, is the hollow shaft 22, the forward end of which extends slightly beyond the tapering end of the casing. This forward end of the shaft 22 is somewhat tapered and divided by longitudinal slits, into arms 23 of segmental cross-section, the portion of the shaft at the bases of these arms being screw-threaded to engage an interior thread on the base of the clamping-cap 24, the screwing on of which forces the segmental arms inward to grasp a tool or pencil placed between them. This securing device may,

however, be dispensed with, and any ordinary form of tool-holder adapted to be secured to the shaft 22 may be used.

On that portion of the shaft 22 extending rearwardly of the swivel journal 19, is secured the sleeve 25 having the cam-groove 26 cut into the periphery thereof. This groove is adapted to be engaged by the end of the screw 27 working in a perforation in the case 13, and when thus engaged, the rotation of the shaft 22 will cause the same to be reciprocated by the cam. The rear end of the shaft 22 is connected by means of the flexible shaft 28 with the forward end of the shaft 12 supported in a bearing 29 in the rear end of the casing, and surrounding the junction of the shaft 22 and the flexible shaft 28 is secured the sleeve 30. The shaft 12 is furnished with a longitudinal spline 31, which engages with a slot in the clutch 32 having the clutch-pins 33 and a circumferential groove 34 into which the pin 35 extends, the outer portion of this pin being secured in a slide 36 working in a slot in the casing; by this means, the clutch-pins 33 of the clutch may be thrown into and out of engagement with the pins 37 of the cam-sleeve 38, which is independently rotatable on the shaft 12 when not so engaged. The cam sleeve 38 is furnished with a cam-groove 39, and longitudinal movement of this sleeve is prevented by the pin 40 entering the groove 41 cut around the shaft 12.

At a point on the inner side of the casing, opposite the flexible shaft 28, is pivoted the lever 42, by means of a screw-pivot 43 passing through the reinforce stud 44. The forward end of this lever is pivotally secured to the sleeve 30, and the rear end thereof is furnished with a pin which is engaged in the diagonal slot 45 formed on the sliding-bar 46, the forward end of which extends inward toward and alongside of the flexible shaft 28. The main portion of this bar 46 has a rounded outer surface, as shown in Fig. 6, to correspond with the interior surface of the casing; and from this main portion there extends a fin 47 which slides in a longitudinal slot cut through the casing, while at its rear end it is furnished with a pin 48 which enters the cam-groove 39 and is operated by the rotation of the cam-sleeve 38 to reciprocate the bar 46.

When the parts of the device are in the position represented in the drawings, and the shaft 10 is rotated, this movement will be conveyed to a pencil or tool held by the forward end of the shaft 22; at the same time the cam-sleeve 38 will be revolved, and the slide-bar 46 controlled by the pin 48 entering the cam-groove 39 will be reciprocated. This motion will be transmitted by the lever 42, to cause the outer and inner ends of the shaft 22 to vibrate. If, however, the cam-sleeve 38 be liberated by pushing the clutch 32 backward, the oscillation of the lever 42 will cease and the shafts and their connections will simply

rotate; to attain a steady rotary movement, I prefer to move the sleeve 20 forward until the wings 21 enter the slots in the collar 15.

To secure a plunging motion of the tool-shaft, I first disengage the clutch 32 from the cam-sleeve 38, and then turn the screw 27 until its end engages with the cam-groove 26. The rotation of the shaft will now cause the same to reciprocate for a distance equal to the extension of the cam-groove 26 from a true circle. By the use of the hand-piece, thus described, the retouching and finishing of photographic negatives is greatly facilitated as the movement is uniform and rapid,—since a considerable degree of artistic skill is required in retouching negatives, it is obvious that the saving of time is of importance.

Having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. In a mechanical handpiece, the combination with a rotatable, vibratile tool-holder suitably supported in a casing, of a sleeve, 25, having a cam-groove, secured to said holder, a device for engaging said groove carried by the case, and means for operating said holder, as described.

2. The combination in a mechanical hand-piece for retouching photographic negatives having a rotatable, vibratile tool-holder, with the lever 42 pivoted to said holder and to a stud on the casing, and having a pin engaging the slot 45 in the reciprocating-bar 46, and a pin 48 extending from the rear end of said bar, of a sleeve 38 carried by the rotatable shaft 12 and furnished with a cam-groove for engaging the pin 48, and a flexible shaft 10 secured to the shaft 12 through which rotation may be imparted thereto, as described.

3. The combination, in a hand-piece for retouching photographic negatives, with the casing 13 having the tapering end 14, a collar 15, having the slots 16, secured in said casing, the journal-sleeve 19, provided with the pivots 18, extending through the slots 17 and secured in the sleeve 20, and the wings 21 on said sleeve, of the hollow shaft 22, having means for securing a tool to the same, extending through the journal-sleeve 19 and rotatable therein, a cam secured to said shaft, and a device for engaging the same secured to said casing, and means for rotating and vibrating said shaft, as described.

4. The combination, in a hand-piece for retouching photographic negatives, with the casing 13, the shaft 22 journaled in the sleeve 19 pivoted therein, the shaft 12 journaled in the sleeve 29 and having a spline 31, the flexible shaft 28 connecting the ends of said first mentioned shafts, and means for rotating said shafts, of the clutch-sleeve 32, longitudinally movable on the shaft 12 and engaging the spline 31, operated by the pin 35 extending through said casing, the cam-sleeve 38 independently rotatable on said

shaft 12, and having a cam-groove 39, a re-
ciprocating-bar 46 having a guide-fin 47 slid-
ing in a slot in the casing, and a pin 48 en-
gaging in the cam-slot 39, a diagonal slot 45
5 cut through the forward end of said bar, and
a lever 42 pivoted to the stud 44 on the cas-
ing, and having a pin engaging in the slot 45,
pivotally connected to the sleeve 30, carried

by the shaft 22, as and for the purpose de-
scribed. 10

In witness whereof I have hereunto set my
hand.

ALBERT J. BENNETT.

Witnesses:

J. A. MILLER, Jr.,
HENRY J. MILLER.