W. BOOTH. 2 Sheets—Sheet 1.

Machine for Rounding Off the Ends of Combs.

No. 207,845. Patented Sept. 10, 1878.

Fig: 1

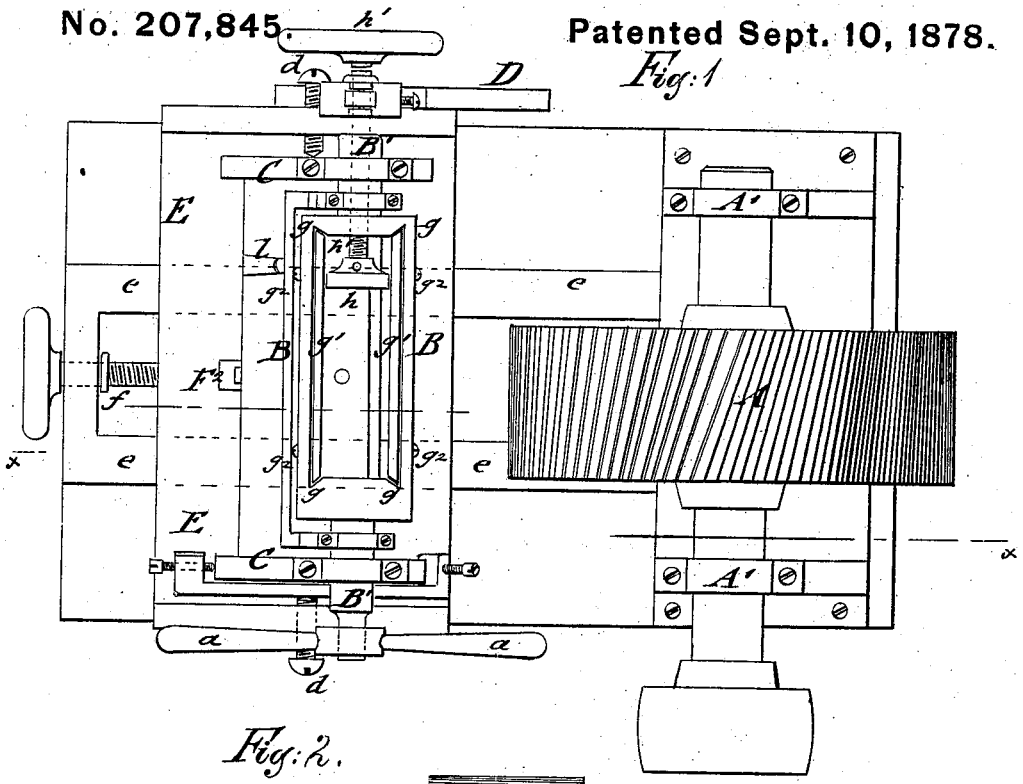
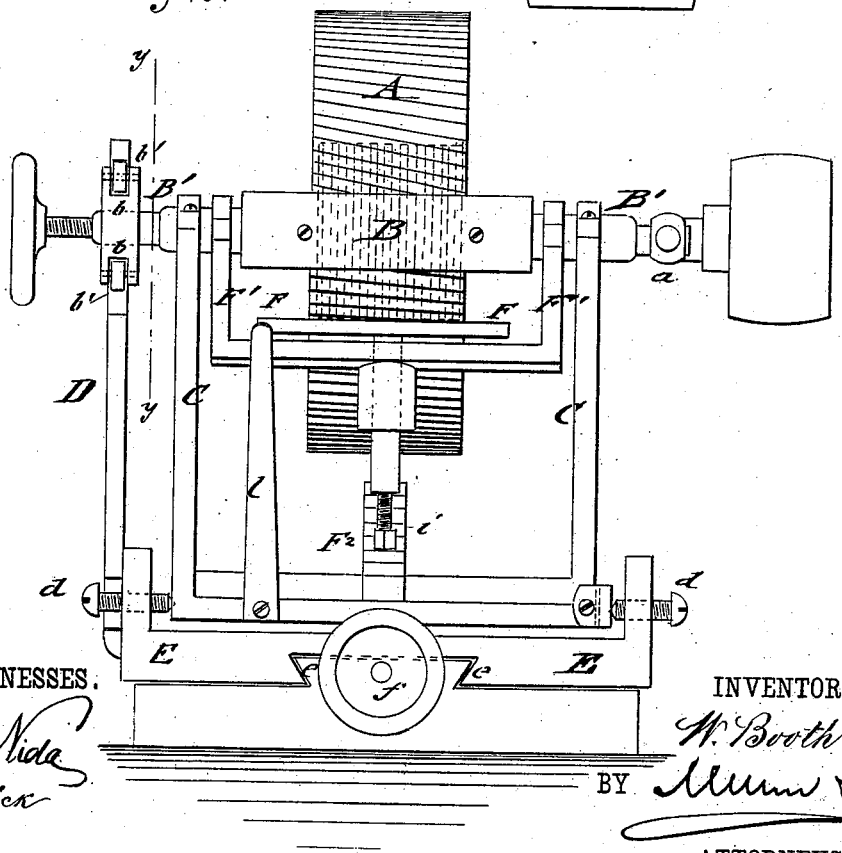


Fig: 2.



WITNESSES.

Chas. Nida

C. Sedgwick

INVENTOR:

W. Booth

BY Munn & Co

ATTORNEYS.

2 Sheets—Sheet 2.

W. BOOTH.

Machine for Rounding Off the Ends of Combs.

No. 207,845 **Patented Sept. 10, 1878.**

Fig: 3.

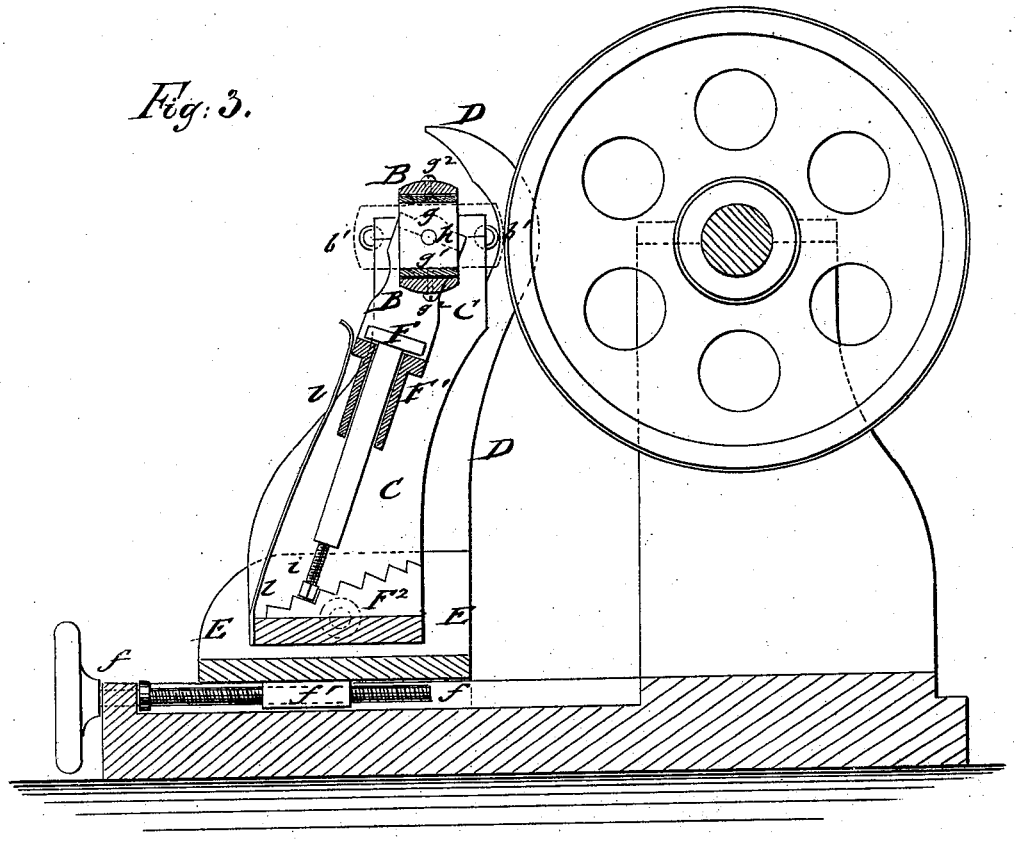
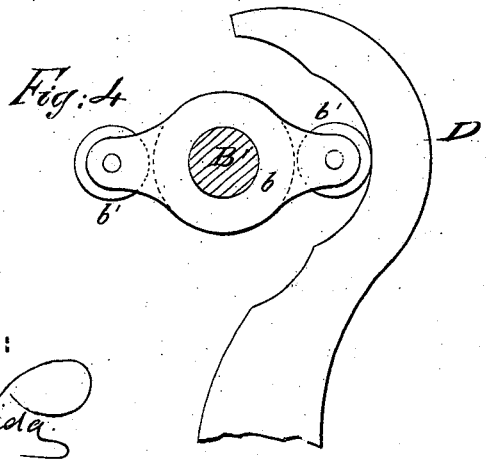


Fig: 4



WITNESSES:

Chas. Nichols
A. Sedgwick

INVENTOR:

W. Booth

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM BOOTH, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR ROUNDING OFF THE ENDS OF COMBS.

Specification forming part of Letters Patent No. **207,845**, dated September 10, 1878; application filed August 9, 1878.

To all whom it may concern:

Be it known that I, WILLIAM BOOTH, of Newark, in the county of Essex, State of New Jersey, have invented a new and Improved Machine for Rounding Off the Ends of Fine Combs, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a plan view, Fig. 2 an end elevation, and Fig. 3 a vertical longitudinal section on line *x x*, Fig. 1, of my improved machine for rounding off the ends of fine combs; and Fig. 4 is a detail side view of the pattern-arm that guides the rotating comb-box toward the cutting-wheel.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved machine for cutting or rounding off the ends of fine combs, such as are made of celluloid, hard rubber, and other material, the machine being adapted for cutting different sizes of combs, and accomplishing its work in a rapid and accurate manner.

The invention consists, essentially, of a revolving cutter-wheel, in connection with an axially-turning comb-box, supported on oscillating standards. The comb-blades of different sizes are adjusted in the box by means of interchangeable interior strips, and firmly held by a clamping-follower. They are centered in the box by a guide-plate that slides in a spring-acted guide-frame, and rests on a step-shaped base-support. The rotating comb-box is guided toward the cutting-wheel along a pattern-arm by radial arms with anti-friction rollers. The distance of the comb-box from the cutter is adjusted in proportion to the length of the combs by making the base-plate of the standards movable on the bed-plate of the machine.

Referring to the drawings, A represents the cutting-wheel of my improved machine for rounding off the ends of fine combs. The cutting-wheel A is revolved by suitable power, its shaft being supported in bearings of upright posts or standards A′. The circumference of the cutting-wheel is provided with a number of inclined cutting-edges, as shown in Fig. 1.

In front of the cutting-wheel is arranged a comb-box, B, that receives the comb plates or blanks to be cut, the shaft B′ of the box B being supported in bearings of oscillating standards C, and provided at one side with lever-handles or a hand-wheel, *a*, for turning the box, and at the other side with radial arms *b*, carrying anti-friction rollers *b′*, that form contact with an arc-shaped pattern-arm, D, that is attached rigidly to the base-frame E of the oscillating arms C. The oscillating arms C are connected by a transverse plate at their lower end, and hung to pivots *d* of the base-frame E, which latter is adjusted toward or from the cutting-wheel by dovetailed guide-rails *e* of the bed-plate of the machine, and by a set-screw, *f*, engaging a fixed nut, *f′*, of the base-frame E.

The top of the guide-rails *e* is graduated, so that the comb-box may be readily adjusted closer to or farther from the cutting-wheel, according to the size of the combs to be cut. The larger sizes require that the entire mechanism is set farther from the cutter, while for the smaller sizes it is set closer thereto. The inner corners of the comb-box are provided with dovetailed recesses *g*, into which interchangeable face-plates g^1, of greater or less thickness, according to the width of the different sizes of combs, are inserted, and then secured by fastening-screws g^2.

A detachable and interchangeable follower, *h*, is attached, by a key, to a screw-spindle, *h′*, which passes through the tubular end of the shaft B′ of the comb-box, and is adjusted by a hand-wheel at the outer end to the comb-blanks in the box. The blanks are centered in the comb-box as to their length by means of an adjustable centering-plate, F, whose stem is guided in a pendent frame, F^1, that swings loosely on the shaft of the comb-box. The lower end of the stem of the centering-plate has an adjusting-screw, *i*, that rests on a fixed step-shaped support, F^2, of the transversely-connecting piece of the oscillating standards C, the set-screw *i* and steps being so arranged as to correspond exactly to the length of the different sizes of combs.

By placing the centering-plate F in proper position on the step-shaped support, inserting the corresponding face-plates and follower into

the comb-box, and putting then the comb-blanks into the comb-box, the blanks are directly and accurately centered, when their lower ends form contact with and rest on the centering-plate F. The follower is then tightly screwed up to the blanks, and they thereby firmly clamped and ready for the cutting operation.

A strong steel spring, *l*, bears on the pendent guide-frame of the centering-plate, so as to keep the same in position on its step in adjusting the blanks. As soon as the adjustment is completed and the blanks are tightly secured in the box, the centering-plate is lowered to the bottom of its guide-frame, so as to give play for the turning of the comb-box, and exposing the blanks to the cutting action of wheel A. The base-frame E is also adjusted to the size of combs to be cut, so that by turning the box the projecting ends of the blanks are rounded off by the cutting-wheel, the arc-shaped pattern-arm guiding the comb-box at the proper distance from the wheel. The oscillating standards are next swung back, and the shaft of the comb-box turned for the second half of a revolution, so as to expose the opposite ends of the blanks to the cutting action of the wheel. They are thus cut symmetrically to the center at both ends, and then removed from the box, and another charge of blanks inserted to be centered and clamped as before, and then cut by slowly turning the box through the two semi-revolutions. Before the anti-friction roller of the shaft of the comb-box forms contact with the arc of the fixed pattern-arm it passes along a short arc or fender, so as to keep the blades off the cutting-wheel until the guide or pattern arc is reached. The cutting of the blank ends then takes place, and continues until the arc at the upper terminus of the guide-arc takes off the combs from the cutting-wheel, the cutting action of the wheel being only exerted for the time the box is guided along the pattern-arc. By changing the pattern-arm different degrees of curvatures of the ends of the combs are obtained. The rounding off of the edges of the combs is thereby accomplished in reliable and uniform manner without the least chance of injury to the blanks in cutting.

The apparatus is readily adjustable to the sizes of combs, the blanks quickly placed in the box, instantly centered, clamped, and exposed by turning the comb-box to the cutting action of the wheel, accomplishing thus the work for any size of comb in superior, quick, and economical manner.

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

1. The combination of the rotating comb-box, having inner guide-recesses, with interchangeable side plates of different thickness, and with an interchangeable clamping-follower, substantially as specified.

2. The combination of a revolving cutting-wheel, a rotating comb-box, oscillating standards, and an adjustable base-frame with guiding and adjusting mechanism of the bed-plate, to set the comb-box nearer to or farther from the cutting-wheel, substantially as specified.

3. The combination of the rotating comb-box with a guide centering-plate and with a step-shaped base-support, to center the blanks of different length in the comb-box, substantially as described.

4. The combination of the rotating comb-box supported on oscillating arms, and provided with guide arms and rollers, with a fixed arc-shaped pattern arm or standard of the base-frame, for guiding the blanks to the cutting-wheel, substantially as described.

5. The combination of the rotating comb-box with a centering-plate that is guided in a pendent and spring-acted frame, and adjusted to the length of combs by a set-screw and a step-shaped support of the oscillating frame, substantially as set forth.

WILLIAM BOOTH.

Witnesses:
HORACE E. MILLER,
PAUL GOEPEL.