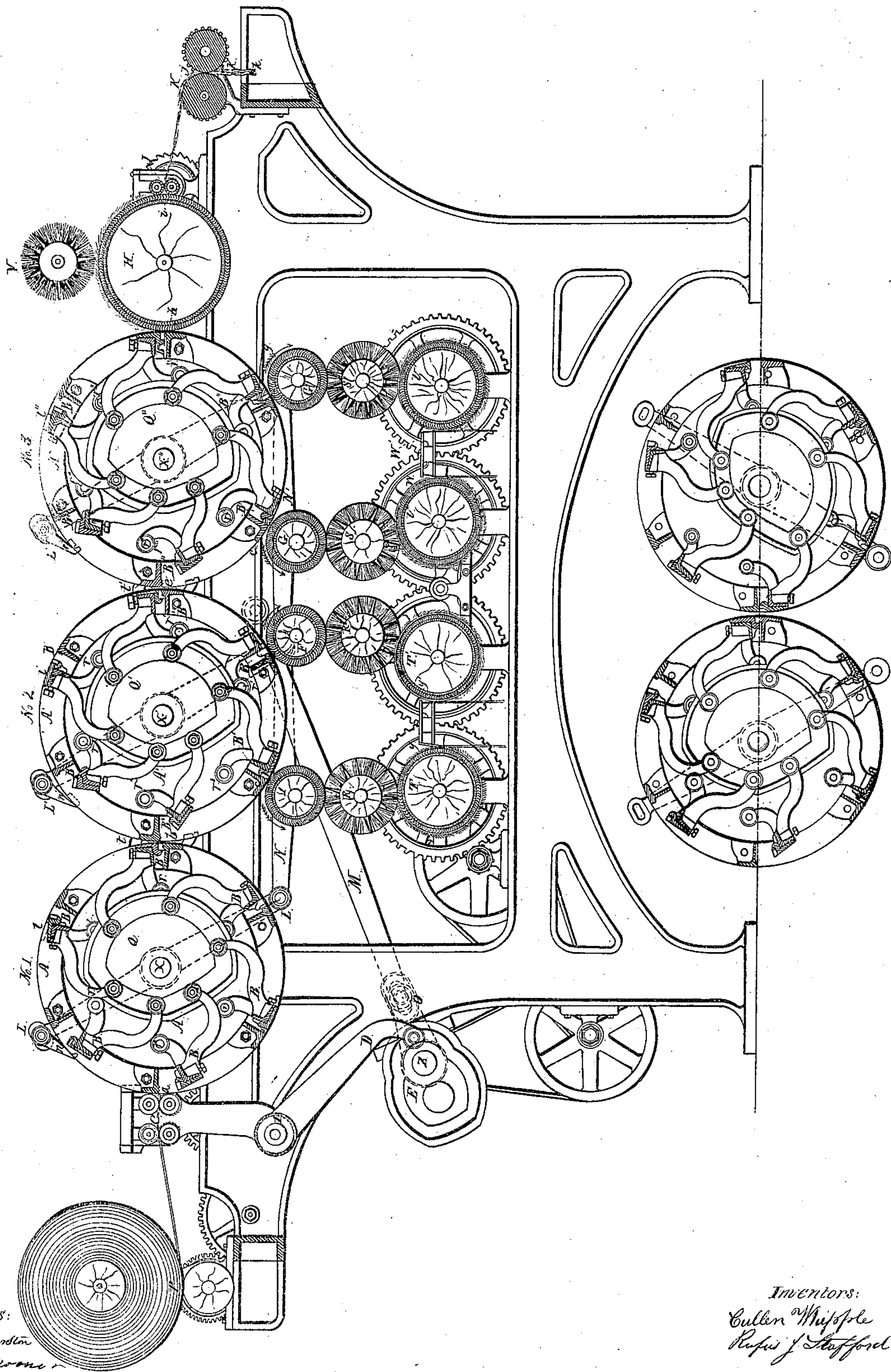


*Whipple & Stafford.*  
*Machine for Combing Cotton.*

*N<sup>o</sup> 34,606.*

*Patented Mar. 4, 1862.*



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# UNITED STATES PATENT OFFICE.

CULLEN WHIPPLE, OF PROVIDENCE, AND RUFUS J. STAFFORD, OF SMITHFIELD, RHODE ISLAND.

## IMPROVEMENT IN MACHINES FOR COMBING COTTON.

Specification forming part of Letters Patent No. 34,606, dated March 4, 1862.

*To all whom it may concern:*

Be it known that we, CULLEN WHIPPLE, of the city and county of Providence, in the State of Rhode Island, and RUFUS J. STAFFORD, of Smithfield, in the county and State aforesaid, have invented a new and useful Improvement in Machines for Combing Cotton and other Fibrous Material; and we do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is a side view of the entire machine. Figs. 2 and 3 are side views of the cylinders which handle the cotton or other material while it is being combed.

The machine which is the subject of this patent is particularly adapted to the combing of cotton or other fibrous material having a short staple; and our invention to accomplish this, purpose as herein exhibited, consists in a mode of operation whereby successive tufts of the material are separated from the stock to be combed, both ends of each tuft combed on each side of the fiber, and the tufts deposited again in overlapping shingles and reunited in a continuous sliver, the noils and waste being made to pass off at a different point of the machine.

The material to be combed is fed to the machine through the feed-rollers C. These feed-rollers are mounted on arms D, which are pivoted to the frame of the machine at 1, and which are made to oscillate at stated times by the action of the grooved cam E upon the lower extremity of the arm D.

The means by which the material is handled in its passage through the machine consist of a number of jaws B B' B'', divided into three sets, No. 1 No. 2 No. 3, parallel to each other. Each set is arranged like the floats of a water-wheel around a central shaft X X' X'', upon which the disks A A' A'', on which the several sets of jaws have their bearings, are capable of easily turning. The periphery of each of the disks has as many notches cut in it as there are sets of jaws, so that by means of the pawls n n' n'', attached to the arms L L' L'', keyed to their respective shafts X X' X'', and connected by the rod N

N', which is worked by the shackle-bar M, an intermittent rotary motion is given simultaneously to each disk, and consequently to the set of jaws attached thereto. The cams Q Q' Q'' being secured upon their respective shafts X X' X'' oscillate with them, and thereby each controls the opening and closing of the set of jaws which is intermittently revolving around it. The manner in which this is effected is as follows: Each pair of jaws B B' B'' consists of one stationary and one movable jaw. Each movable jaw is pivoted, as shown at r r' r'', and has a long arm projecting from it, the extremity of which is provided with a pin which works in the groove of the cams Q Q' Q'', respectively. The outline of the groove in the cam is shown in the drawings. If its face was a true circle described from X X' X'' as a center, the several sets of jaws would remain constantly closed. By cutting away, however, the side of the cam toward the front of the machine the long arm of each jaw is in succession drawn nearer the center X X' X'', and consequently each pair of jaws after leaving the circular part of the cam commences to open. It must be borne in mind that the cams Q Q' Q'' have a rocking motion, while the disks to which the several sets of jaws are attached have an intermittent rotary motion, and that each cam travels with its respective disk in one direction, but rocks in the opposite direction while its disk is at a state of rest. Suppose now the cotton or other material to be worked be introduced between the feed-rollers C at the front of the machine. The position of the bell-crank arm D, upon which the feed-rollers are mounted, is such that the end of the stock is presented between the open jaws B of the first cylinder. The shackle-bar M now commences to travel toward the left, and consequently the cam Q, operated as already described, is rocked in the same direction, while the pawl n is moved back to the notch l on the periphery of the disk A. The rocking of the cam Q causes jaw B to be closed upon the end of the cotton. So soon as this is done the conformation of the cam E causes the arm D to be moved toward the right, and consequently the feed-rollers C are moved away from the face of the cylinder, the result of which is that a tuft of the stock is detached from the main body.



The shackle-bar M now commences its stroke in the opposite direction, and the disk A is moved another fraction of a circle, bringing a second pair of jaws to the position occupied by the first pair. Each pair of jaws in succession is thus supplied with a tuft of the stock, the feed-rollers alternately approaching to and receding from each pair to effect the result, as already described. Each pair of jaws which has taken a tuft of cotton is kept closed upon it by the action of the cam Q until it reaches a point in the revolution of the disk opposite to that where it seized hold of the cotton, when its hold is relaxed and the tuft is seized by the jaws B' of cylinder No. 2, the operation of which, as well as the operation of cylinder No. 3, is in all respects identical with that of No. 1. As each tuft in succession is transferred to the cylinder No. 2 it is held by the jaws B by the end opposite to that which was seized by the jaws of cylinder No. 1. In the progress of the revolution of No. 2 it is presented to the combing-cylinder F, which consists of a roll covered with card-clothing or other combing-teeth, and which revolves in the direction of the arrow at any desired rate of speed obtained from a driving-belt. One side of so much of the tuft as projects beyond the jaws is thus combed while the cylinder No. 2 is at rest. At the next position of No. 2 the tuft is brought in contact with a similar combing-cylinder F', which revolves by the same means and at the same rate of speed as the first in an opposite direction, and thus the other side of the projecting end of the tuft is combed. The tuft, now half-combed, is carried by the intermittent motion of the cylinder No. 2 to a point opposite to that at which it was taken from No. 1 and is delivered to cylinder No. 3. Each tuft is seized in succession by one of the pairs of jaws upon No. 3 in the same manner as has been described when speaking of the jaws of No. 2 and is held by the end which has been previously combed. As cylinder No. 3 revolves each tuft is presented first to the combing-cylinder G and next to the combing-cylinder G', which are in all respects arranged with reference to cylinder No. 3 like the combers F and F' with reference to cylinder No. 2. Every part of the tuft is thus thoroughly combed. When each tuft has arrived at a point opposite to that at which it was seized by the jaws of No. 3 it is taken by the doffer H from the jaws which previously held it and whose grasp is now relaxed. A batting of successive shingling

courses is thus formed upon the doffer, from whence after the fibers have been laid and the mass rendered homogeneous by the action of the revolving brush V, located above the doffer, it is taken off in the usual way in the form of a continuous sliver.

Underneath each one of the combing-cylinders F F' G G' is placed a brush R R' S S', which cleans the cylinder of the waste material and deposits it upon the doffers T T' U U', each of which is covered with card-clothing. From these cylinders the strippers y y' w w', operated in the usual way, remove the waste and it falls in thin battings of noils underneath the machine.

Instead of three sets of jaws, as shown, two only can be with advantage employed; but in such cases each tuft would have the end that was detached from the main body of the stock first combed, whereas we have found that a better result is obtained by combing the tuft first in the direction in which the fiber is naturally laid.

We do not intend to limit ourselves to the special construction or arrangement of the several parts as described, but mean to cover all merely formal variations performing the same mode of operation by equivalent means.

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. The mode of operation, substantially as specified, by means of which a tuft of cotton or other fibrous material, after it has been detached from the main body of the stock, is transferred to successive holding-jaws and subjected to the operation of being combed alternately on each side and both ends, as set forth.

2. The combination of a pair of vibrating feed-rollers C with a series of jaws B B, having an intermittent rotary motion, substantially as described, for the purpose of separating the stock to be combed into tufts.

3. Giving to each series of jaws an intermittent rotary motion, substantially as described, for the purposes specified.

4. A doffer-cylinder H, in combination with the cylinder No. 3, so arranged as to receive the several tufts after they have been combed in successive overlapping layers preparatory to being formed into a continuous sliver.

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