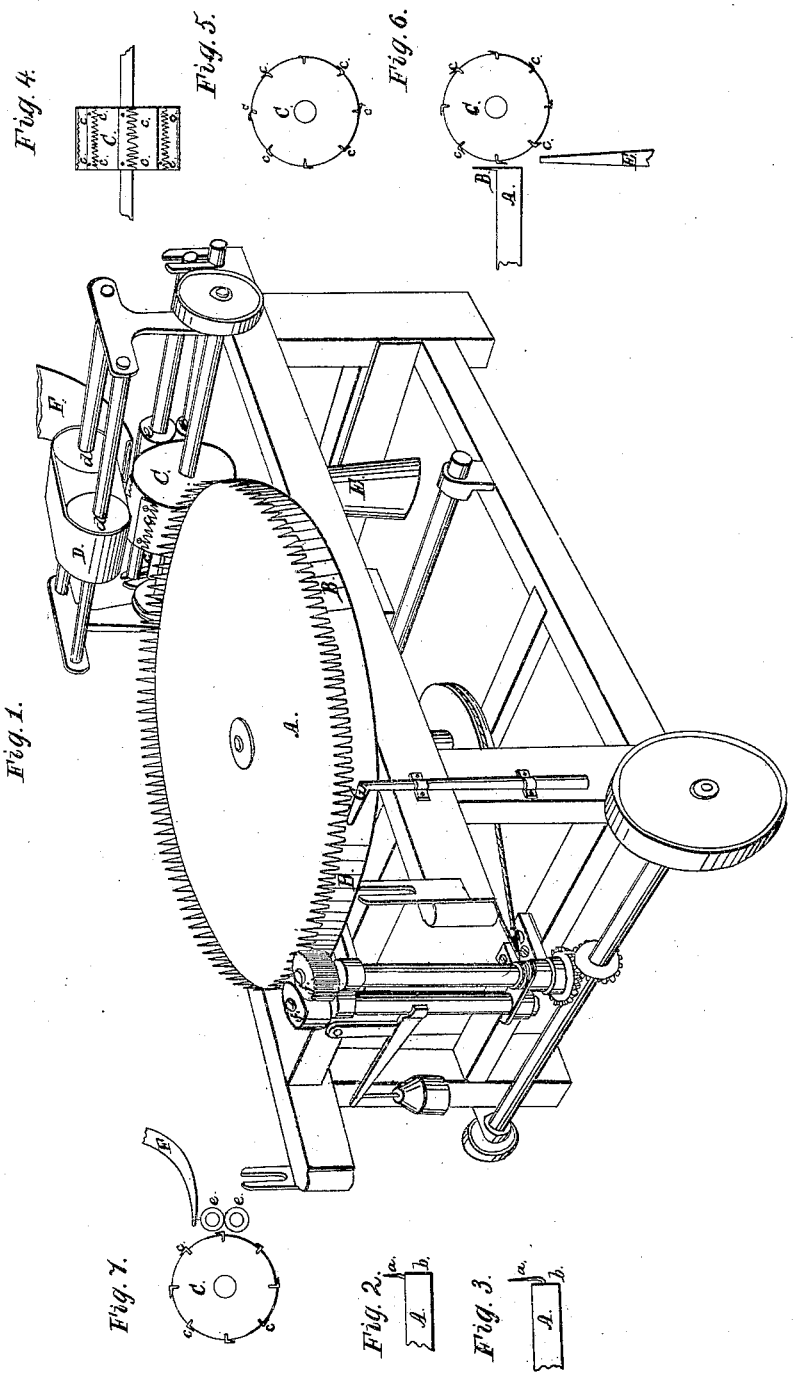
F. A. Calvert,

Combing Machine.

No. 2,278. Patented Oct. 9, 1841.



UNITED STATES PATENT OFFICE.

FRANCIS A. CALVERT, OF LOWELL, MASSACHUSETTS.

MACHINE FOR COMBING AND PREPARING WOOL AND OTHER FIBROUS SUBSTANCES.

Specification of Letters Patent No. 2,278, dated October 9, 1841.

To all whom it may concern:

Be it known that I, FRANCIS A. CALVERT, of Lowell, in the county of Middlesex and State of Massachusetts, have made certain improvements in machines for the combing and preparing of wool, flax, or other fibrous materials to be spun and wrought into fabrics of various kinds; and I do hereby declare that the following is a full and exact description thereof.

This machine, in its general construction, resembles that which is described in the second volume of the first series of the *Repertory of Arts*, and for which Letters Patent were granted to H. Wright, and J. Hawksley in England, in the year 1793; and that, also, for which Letters Patent were granted in the United States to William W. Calvert, on the 18th day of September 1835, for a like purpose.

My first improvement consists in the manner in which I arrange the teeth around the revolving table, or disk, so as to cause said teeth to rise in a line with the periphery, or so that the circle generated by the revolution of their points shall not be smaller than that of the periphery of the disk.

My second improvement is in the manner of forming the combing cylinder which I use instead of the wire teeth combing wheel employed by Wright and Hawksley, and of the brush, or wire teeth, used by Wm. W. Calvert.

My third improvement is in the using of an endless belt above the combing cylinder, for the purpose of cleaning the fibers from the teeth of said combing cylinder, and of laying them in such manner as that they shall be ready to be received upon the teeth of the revolving disk.

My fourth improvement consists in the causing of a current of air, or of steam, to be blown upon the fibers of wool, or of other material, as they are delivered from the combing cylinder to the toothed disk, in order to prevent the hanging down of any of said fibers below the teeth, by which they would be prevented from being properly combed; and also in directing a similar blast in a horizontal direction above the upper feed-roller, and against the combing-cylinder, to prevent the fibers from lapping around said roller, and to lay them close on to the combing cylinder.

My fifth improvement is the substituting for the apparatus called the universal swiper in Wm. W. Calvert's machine, a blast of air, or of steam, which is directed on to the fibers as they are about to pass from the revolving disk to the drawing rollers, thus causing them to be perfectly taken up by said rollers.

Figure 1, in the accompanying drawing, is a perspective view of a part of my machine; but it is not thought necessary to describe the gearing, or the manner of driving the respective rollers and other revolving parts, this not differing from that adopted in similar machines, and being well known.

A, is the horizontal, revolving table, or disk, the periphery of which is surrounded by teeth, B, B, pointing upward, as in other combing machines; but not, as has been heretofore done, inserted into the disk at the distance of from a sixteenth to an eighth of an inch from its extreme edge, or periphery; as when so inserted, the combing is less perfectly performed than by my method of arranging, or inserting them. The plan which I prefer is to take a hoop of steel of such diameter as to fit on to and embrace the disk, and of such width as to admit of its being cut into teeth on its upper edge, which teeth shall rise to the required height above its face; the teeth by this means will be without any projecting shoulder at the lower ends, and the combing will not be obstructed from this cause. A similar effect may be produced by inserting the teeth in the disk in the ordinary way; that is by drilling holes in the face of it, near to its periphery, to receive the said teeth, and bending the wires constituting said teeth in such manner as that the upper portions of them shall be in a line with the edge of the disk, as shown in Fig. 2, where *a*, is a wire so bent, and *b*, the periphery of the disk; or, instead of this manner of forming them, the wire teeth may be inserted in the periphery of the disk, and be bent up at right angles with its plane, as shown in Fig. 3; these modes of inserting wires are, however, more troublesome than and not equally good with, that of forming the teeth on the hoop, in the manner described, while they are substantially the same in principle, being designed to attain the same end by means substantially the same.

C, Fig. 1, is the combing cylinder; and the teeth *c*, *c*, of this cylinder I also form from steel plates, instead of making them of wire, as has been usually done, which wires when inserted in a piece, or strip, of metal have

a shoulder at their points of insertion, and are otherwise objectionable. The toothed plates which I use may be screwed on to the cylinder, as shown in Fig. 4; or the plates may be bent at right angles, and inserted in kerfs made along the cylinder, as shown in Fig. 5. By this manner of constructing or forming the teeth, they are not liable to derangement, and are readily kept clean, while, when inserted in the old way, they constantly become foul about the shoulders formed at their lower ends, and are cleaned with difficulty. By constructing the disk and the combing cylinder in the manner above described, a larger quantity of long fiber is obtained, in consequence of its admitting of the combing cylinder and disk being placed nearer to each other than could be effected by the machines heretofore made, producing, as experience has shown, an advantage equal to fifteen per cent. The cylinder C, I make straight on its face, as it is not necessary to give to it such length as to produce any benefit from its being made concave.

D, Fig. 1, is an endless belt passing around two rollers *d*, *d*, immediately above the combing cylinder, and with which said belt is in contact; by means of this belt the fibers are cleared from the combing cylinder C, and are laid in the position best adapted to their being passed on to the teeth of the revolving disk; this is effected by causing the belt D, to move with a velocity equal to about double that of the cylinder C. This velocity may be varied according to the length of the staple to be combed, the belt being made to move more rapidly for long than for short staple wool. In Wm. W. Calvert's machine with a concave combing cylinder, a convex roller is used with the same intention with which I use the revolving belt; but the action of this apparatus has been found defective from various causes, but mainly in consequence of the relative velocities of the concave combing cylinder and of the convex roller being, from their natures, necessarily unequal in their respective parts. The feed from the endless apron on to the concave and convex surfaces is also attended with difficulty.

E, Fig. 1, is a part of a flat tube, or pipe, the open end of which is situated just below the point of action between the revolving disk and the combing cylinder; through this tube a regulated current of air, or of steam, is allowed to pass during the action of the machine. This is an improvement of primary importance, its effect being to prevent the fibers from hanging down below the teeth, by which they would escape from being properly combed; instead of which they are, by this device, all raised up, and the whole of the wool, or other material, is made to assume the position required for the perfect action of the machine. Fig. 6, is a section through the combing cylinder C, the edge of the revolving disk A, and the flat, blowing tube E, showing the relative position of the latter.

In Fig. 7, C, is a section of the combing cylinder, and *e*, *e*, are the two feed rollers which conduct the fibers from the endless apron on to said cylinder, and F, is a flat tube which I sometimes employ to cause a current of air, or of steam, to pass directly over the top of the upper feeding roller, which blowing has the double effect of preventing the lapping of the wool, or other fibers, around said roller, and of laying them close on to the teeth of the combing cylinder, and, consequently, of aiding the action of the endless belt.

G, Fig. 1, is a tube through which a current of air, or of steam, is to pass, in such direction as to operate on the fibers in the teeth of the disk A, as they are about to pass to the drawing rollers *f*, *f*, thereby causing them to be taken up by said rollers and consequently to perform the same office with the swiper in Wm. W. Calvert's machine, but in a manner much more simple and effective.

Having thus, fully described the respective improvements made by me in the machine for combing wool, and other fibrous substances, what I claim therein, and desire to secure by Letters Patent, is—

1. I claim, in combination with the combing cylinder of the machine herein described, the so arranging of the vertical teeth around the periphery of the revolving disk as that the circle generated by the revolution of their points shall not be less than that of the periphery of the disk, thereby avoiding the forming of a shoulder which will interfere with the near approach, and advantageous action of the combing cylinder, as herein set forth.

2. I claim the forming of the teeth of the combing cylinder of plates of metal, instead of from wires inserted into a metallic strip, as heretofore practiced; said metallic plates being attached to the cylinder by screws, or kerfs, in the manner described, or in any similar manner which will avoid the formation of a shoulder, which has a tendency to become clogged, and thus interferes with the action of the machine.

3. I claim the combining with the combing cylinder in a machine for combing wool, flax, &c., an endless belt made to revolve above said cylinder, in the manner and for the purpose, set forth.

4. I claim the blowing of a current of air, steam, in a vertical direction, through a flat tube, situated immediately below the point of action between the revolving disk and the combing cylinder, for the purpose and in the manner set forth.

5. I claim the employment of a similar tube and current directed horizontally over the top of the upper feeding roller, and against the combing cylinder, for the purposes herein fully made known.

6. I claim the directing of a current of air, or of steam, against the combed fibers as they are passing from the revolving disk to the drawing rollers for the purpose of elevating such portion of said fibers as might not otherwise be duly taken in between said drawing rollers; the whole being constructed, and operating, substantially as described.

FRANCIS A. CALVERT.

Witnesses:

HORATIO G. F. CORLISS,

JOHN P. ROBINSON.