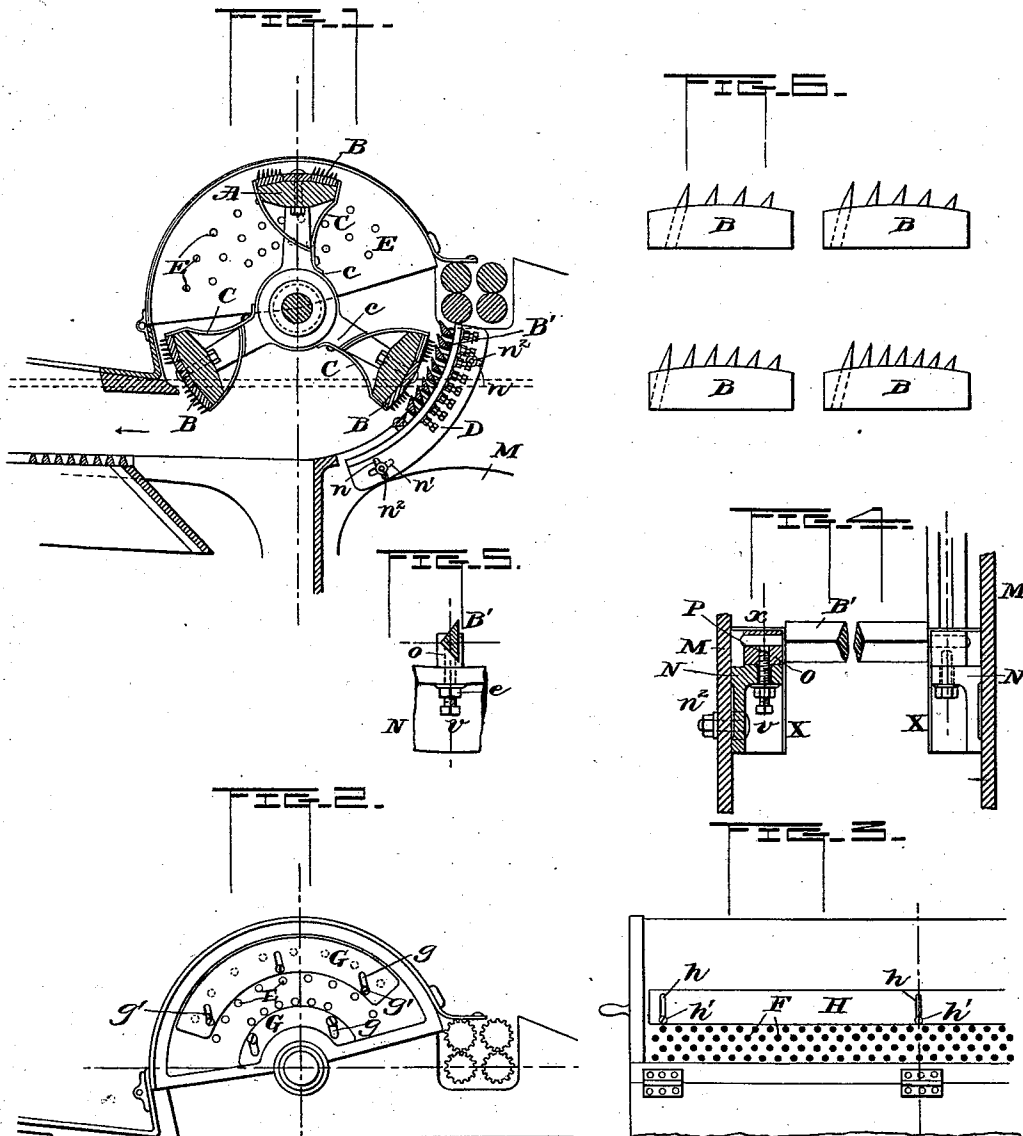


(No Model.)

A. KIRSCHNER.
COTTON OPENER.

No. 531,193.

Patented Dec. 18, 1894.



Witnesses
P. L. Clark.
M. A. Dillon.

Inventor
August Kirschner
By Geo. W. Hines
att.

UNITED STATES PATENT OFFICE.

AUGUSTE KIRSCHNER, OF ST. ETIENNE-DE-ROUVRAY, FRANCE.

COTTON-OPENER.

SPECIFICATION forming part of Letters Patent No. 531,193, dated December 18, 1894.

Application filed April 28, 1892. Serial No. 431,086. (No model.) Patented in England November 17, 1890, No. 18,498; in France November 22, 1890, No. 209,706; in Belgium March 28, 1891, No. 94,322; in Italy April 22, 1891, No. 29,595, and in Switzerland April 30, 1891, No. 3,581.

To all whom it may concern:

Be it known that I, AUGUSTE KIRSCHNER, a citizen of the Republic of France, residing at St. Etienne-de-Rouvray, in the Department of Seine-Inférieure, France, have invented certain new and useful Improvements in Cotton-Openers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has been patented in France, No. 209,706, dated November 22, 1890; in Great Britain, No. 18,498, dated November 17, 1890; in Belgium, No. 94,322, dated March 28, 1891; in Italy, No. 29,595, dated April 22, 1891, and in Switzerland, No. 3,581, dated April 30, 1891.

The essential part of my scutching or beating apparatus for opening cotton or other fibers and preparing them for spinning is the beater consisting of two or three bars or rails carried by radial arms attached to a spindle.

The cotton being fed into the machine receives two or three blows for every revolution of the beater according to the number of rails and is thus worked or opened into small flakes. Suitable fans are employed in conjunction with the apparatus to induce currents of air by which the flakes of opened cotton are carried on to be further treated.

Beneath the beater is arranged a grate through which pass the burrs and other heavy impurities and foreign bodies separated from the fibers by the scutching action. The centrifugal force of the rotating beater throws the foreign matters against the grate while an air current operating in opposition to the centrifugal force directs the flakes of cotton in another direction. According to these improvements the ordinary bars or rails of the beater are replaced by bars or rails furnished with card teeth or projections, and fan blades may be attached to the beater itself in substitution for the separate fan or fans generally employed in connection with this class of machinery.

The operation of the improved machine is

as follows: The cotton or other fibers are introduced as usual by the ordinary feeding arrangement, and in addition to being batted or scutched are simultaneously carded or combed, a process by which the fibers are much less damaged than by the ordinary process. The combed fibers are preferably not drawn to the sieve drum by a current of air induced by a separate fan but are propelled by the combined beater and fan. As in the ordinary scutcher, the burrs and other foreign bodies are thrown out through the grate by the centrifugal force of the beater. The flakes of cotton are prevented from passing through the openings of the grate by an air current which counteracts the centrifugal force of the fan. This current of air is created by the fan blades attached to the beater. It is therefore evident that the formation of the layer of cotton or lap upon the sieve drum or cage as well as the cleaning or scutching is effected without any apparatus but the combined carding beater and fan. The ventilating channels or trunksserve the purpose of conducting the air that passes through the cage.

For the purpose of enabling my invention to be more easily understood I have hereto appended a sheet of drawings reference to which is hereinafter made.

Figure 1 is a vertical section transverse to the shaft. Fig. 2 is an end elevation. Fig. 3 is a rear view of a portion of the machine. Fig. 4 is a side elevation partly in section of a grate bar. Fig. 5 is a sectional end view of the same. Fig. 6 shows rails having different rows of teeth.

Wooden cross pieces A A are attached to the radial arms of the beater and carry rails or bars B B. These rails are attached to the arms in pairs as shown and are furnished with a number of projections or teeth arranged in rows as shown in Figs. 1 and 6. The teeth or projections are so arranged upon the bars that the first row upon each of the rails upon each arm is nearer the center of rotation than the last so that the points do their work gradually.

The wooden cross pieces A and the radial arms of the beater have attached to them

smooth iron plates or blades C which, combined, serve the double purpose of preventing the fibers from clogging the arms of the beater, and by their action as the blades of a fan, of creating a current of air. The air current thus induced enters the apparatus through the grid or grate D and through the openings E formed in the ends of the casing as shown in Figs. 1 and 2 and through openings F formed in the upper part of the casing opposite to the feeding arrangement (Fig. 3). The air makes its exit through the sieve drum or cage.

Between the spindle of the fan and the edges of the plates or blades C openings *c* are left the size of which has a considerable influence upon the volume and strength of the current of air set up. If they are too small the cotton would be propelled to the cage with less force and the amount of air drawn through the grate would be smaller.

The quantity of air passing through the openings E and F may be easily regulated by means of movable plates G and H. These plates are provided with parallel slots *g, h* receiving set screws *g' h'*, whereby the plates are rendered adjustable. The holes are arranged in rows transverse to the movement of the plates, so that the rows are successively covered or exposed, thus rendering the admission of air uniform at all points. By varying the amount of air passing through these openings the quantity of air and foreign bodies passing through the grate D is regulated. The fiber is thus effectually prevented from passing through the grate with the foreign matters.

The cotton or other similar fiber passing through this machine having been cleaned and subjected to an elementary combing or carding, is formed in a uniform lap thus very considerably simplifying and reducing the work to be done by the carding engine.

The grate D is composed of a series of parallel bars B' whose cross section is a wide isosceles triangle, set so as to present an acute edge to the material which is dragged over them by the teeth on the rails B. These bars have at each end a journal which is rotatable in a bearing block O, resting upon the flange of a curved angle iron N. Screw bolts *v* pass loosely through holes in the flange into tapped holes in the blocks which intersect the bearings for the journals. Between the end of the screw and the journal of the bar is placed a block of copper P. By turning the screw, the copper block is forced against the journal, clamping it tightly in its bearing. In this way the bars are all capable of independent angular adjustment. A lock nut *e* on the screw bolt *v* serves to clamp the block O firmly in place upon the flange of the iron N. These

curved angle irons are rendered adjustable with reference to the shaft of the beater by means of the intersecting radial and concentric slots *n n'* and the clamping bolts *n²* passing through the same into the frame M, as shown in Figs. 1 and 4. The radial slots permit the irons to be moved toward or away from the shaft at one or both ends, while the concentric slots permit them to be moved on the arc of a circle concentric with the shaft. A shield *x* protects the blocks O, and a screen or apron X covers the bolts and nuts to prevent them from being injured or clogged by the refuse passing between the bars.

The upper part of the casing F is hinged to the lower part, to give access to the beater arms, rails, teeth, and fan blades.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a machine for opening and cleaning cotton and other fiber, a device for acting upon the cotton with a progressive penetration, consisting of a shaft provided with radial arms, each arm carrying one or more rails, and each rail having rows of stout rigid teeth, the leading row on each rail being the shortest, and the other rows increasing regularly in length, substantially as described.

2. In a machine for opening and cleaning cotton and other fiber, the combination with a shaft, of radial arms, rails secured to the outer ends of said arms, stout, rigid teeth set in rows in said rails, and progressing in length from the front row to the rear row, and curved metallic plates secured to the arms inside the rails, and having openings between the inner edge of the plates and the shaft, substantially as described.

3. In a machine for opening and cleaning cotton and other fiber, the combination with the revolving beater, of a curved casing covering the same having the rows of holes F, and the sliding adjustable plate H adapted to be moved transversely to said rows of holes so as to cover any number of rows of holes, substantially as described.

4. In a machine for opening and cleaning cotton and other fibers, the combination with the casing having in its ends the holes E, of the plate G provided with slots and screws, and arranged to wholly or partially cover said holes, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTE KIRSCHNER.

Witnesses:

EDOUARD KIRSCHNER,
CLAUDE BEUSELIN.