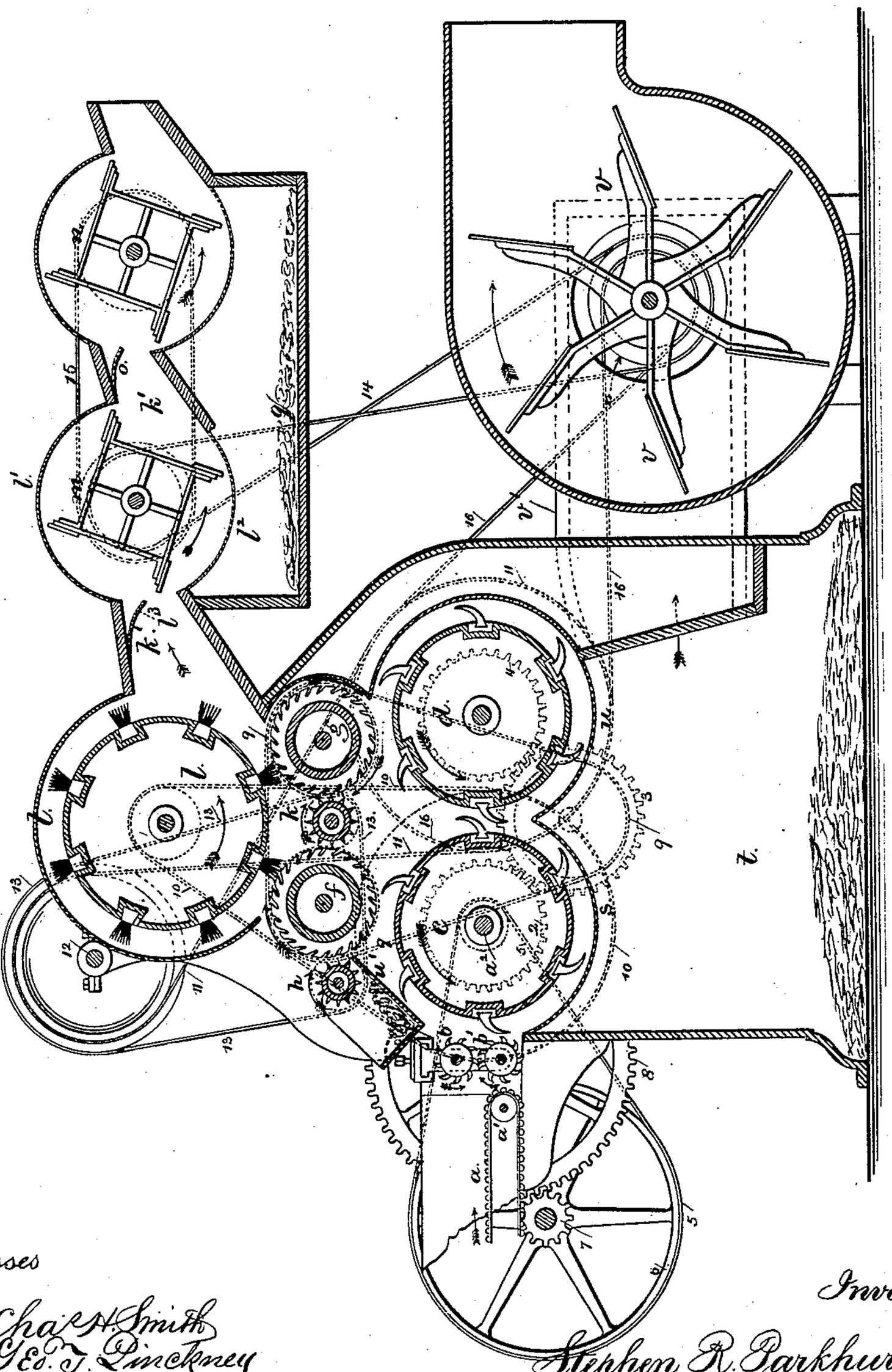
(No Model.)

S. R. PARKHURST.

Machine for Opening and Cleaning Wool.

No. 238,709. Patented March 8, 1881.



Witnesses

Chas. H. Smith
Geo. T. Pinckney

Inventor

Stephen R. Parkhurst

per Lemuel W. Serrell

atty.

UNITED STATES PATENT OFFICE.

STEPHEN R. PARKHURST, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO EMILY R. PARKHURST, OF SAME PLACE.

MACHINE FOR OPENING AND CLEANING WOOL.

SPECIFICATION forming part of Letters Patent No. 238,709, dated March 8, 1881.

Application filed August 20, 1880. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN R. PARKHURST, of Montclair, in the county of Essex and State of New Jersey, have invented an Improvement in Machines for Opening and Cleaning Wool and other Fibrous Materials, of which the following is a specification.

In Letters Patent No. 56,675 granted to me, there are two feeding-rollers and a belt, from which the wool is taken by a picker-cylinder and transferred to two steel-tooth burr-cylinders, and thence removed by a brush.

The object of my present invention is to open and clean the wool instead of picking it. Wool after being washed is matted together, and usually it has been subjected to a picking operation to open the wool previous to carding. In the ordinary pickers the wool is torn and the fiber broken to a considerable extent. My machine, patented as aforesaid, picked and opened the wool with but little injury to the fiber. My present invention is made for preventing, as far as possible, any injury to the fiber. This I accomplish by the combination, with the feed-rollers and the two steel-toothed cylinders, of two cylinders with hooked teeth that are employed in such a manner that the fiber receives three opening and cleaning operations before it reaches the strippers that knock off the burrs and foreign substances, and the speed is regulated in such a manner that the first opening operation is slow, the second is faster, and the third still faster, so that the matted fiber is not torn or cut, but simply pulled apart; and this is done in such a manner that the burrs and foreign substances are loosened, and many fall away before reaching the strippers; and I make use of an additional beater that acts upon the fiber as it is thrown off from the blower, and shake out any loose particles of foreign matter by centrifugal force and concussion.

In the drawing I have represented my improvements by a vertical section of the machine.

The apron *a* is upon rollers *a'*, and it is moved in the direction of the arrow to convey the wool, cotton, or other fibrous material to the steel-toothed feed-rollers *b b'*. The teeth of the feed-rollers *b b'* stand in the same direction as in the said Patent No. 56,675, and the wool is taken from them by the first hooked-tooth opening-cylinder *c*. The teeth of this stand in the opposite direction to those on the picker in said patent, and carry the wool down instead of up. This allows any heavy or large burrs or other pieces of foreign matter to fall off through the grate *s* into the receptacle *t*. The fiber is subjected to a second opening operation by the hooked teeth of the second opening-cylinder, *d*. I prefer to drive the cylinder *d* in the same direction as the cylinder *c*, so that the wool on the teeth of the cylinder *c* is acted upon downwardly, and thereby subjected to a second opening operation and carried along over the grating *u*, so that particles of foreign matter may have an opportunity to fall away, and then the wool is taken up by the toothed opener *d* to the picker-cylinder *g*, and by the opener *c* to the steel-toothed picker-cylinder *f*. These picker-cylinders *f* and *g*, and their revolving stripping-rollers *h* and *k*, are similar to those in the aforesaid patent, but the action in connection with the toothed openers *c d* is very different from that of the steel-toothed cylinders and the one picker shown in said Patent No. 56,675, for in said patent the adjacent surfaces run in opposite directions, while in my present improvement they run in the same direction. The result is that the action upon the wool is more gentle, and the fiber is pulled apart or opened gradually instead of being subjected to the sudden action of teeth moving in opposite directions.

I find that the efficiency of the machine is promoted and the wool kept from injury by making use of a surface-speed about that indicated below; but I do not limit myself in this particular. Starting with a surface-speed of one for the feed-rollers, the toothed opening-cylinders should travel at about double that speed of surface, so that the first opening and cleaning operation between the toothed feed-rollers and the hooked teeth of cylinder *c* will be gradual. If the toothed cylinders *c* and *d* travel at the same speed and in the same direction the adjacent surfaces will have a speed of two, and one be moving in one direction and the other in the other direction. This will

clean and open the wool in a very thorough manner, and as these teeth are smooth hooking tapered teeth they will pull the lock of wool open without injury.

I remark that with some qualities of wool it may be preferable to revolve the cylinder *d* in the opposite direction to that shown, and at a slower speed than the cylinder *c*, in order that the second opening operation may be as gentle as the first opening operation.

With the surface-speed of two for the cylinder *c* the steel-toothed picker-cylinders *f* and *g* should have a surface-speed of about six, so as to draw off the wool and spread it as a thin layer on each cylinder *f* and *g*, and I remark that although the teeth of the cylinders *c* and *d* stand as shown, so that the cylinders *f* and *g* tend to pull the fiber off in the direction of the length of the said teeth on the cylinders *f g*, still the hooked form of such teeth causes them to hold the locks of wool long enough for them to be thoroughly opened as they are taken upon the cylinders *f g*.

The surface-speed of the strippers *h k* should be about twice as great as that of the cylinders *f g*, as usual in this class of machines. The action of these strippers, as is well known, is to spread and open the locks of wool and beat out any burrs or particles of foreign matter. The burrs from the stripper *h* are received into a box at *u'*, as heretofore employed. The burrs from the stripper *k* fall down and eventually drop through the grating or screens *u s*.

The blower *v* is connected, by the trunk *v'*, with the closed box *t* beneath the gratings *u s*, so as to exhaust and drive away any dust that is separated from the wool, and not only aid in clearing the wool, but prevent the dust passing out into the mill.

The delivery-brush *l* is similar to that shown in my aforesaid Patent No. 56,675. It takes the fiber off the steel-toothed picker-cylinders *f* and *g* and blows it away through the trunk *k'*.

In Letters Patent No. 163,687 I have shown a range of fingers in the delivery-trunk of a blower to catch the fiber, and the same is swept off the fingers and subjected to a concussion by a revolving beater.

I have discovered that it is preferable to dispense with the fingers and allow the beaters to act directly upon the fibers or locks of wool as they float in the air, and by concussion and centrifugal action throw off burrs and particles of heavy or foreign matters that may be with the fiber. With this object in view I introduce in the trunk *k'* a revolving beater, *m*, the case or spout at this place having a curved top, *l'*, and a grated bottom, l^2, above the box *q*, and by preference a deflector-plate, l^3, is applied at the upper part of the spout or trunk, so as to give a downward direction to the fiber floating in the air, so that the beater *m* may project the same downwardly against the grating l^2 at the bottom for the aforesaid purposes, and I prefer to use a second revolving beater, *n*, and a second deflector, *o*, so as to expose the escaping fiber to a second cleaning action of the same character as last described, and I remark that a third beater might be employed.

The means for giving rotation to the respective rollers and cylinders are preferably as follows:

The power is applied to the shaft a^2 of the toothed opening-cylinder *c*, and by the gear-wheels 2, 3, and 4 motion is communicated to the second opening-cylinder, *d*.

Upon the shaft a^2 there is a small pulley, and by the belt 5 motion is given to the pulley 6, pinion 7, and gear-wheel 8, which latter is on the shaft of the feed-roller *b'*, and a small wheel on this shaft gears into a wheel on the shaft of the feed-roller *b*, to give motion to said feed-rollers.

The picker-cylinders *f* and *g* are rotated by the belt 9, which passes over pulleys on the shafts of *f* and *g*, and also over a pulley on the shaft of the intermediate gear, 3.

The delivery-brush *l* is revolved by a belt, 10, that passes over a large pulley upon the shaft a^2, and over a pulley upon the shaft of *l*.

A large pulley upon the shaft of the opening-cylinder *d*, and the crossed belt 11, give rotation to the shaft 12, and by the belt 13 motion is given to the stripping-rollers *h* and *k*.

A crossed belt, 16, from the pulley on the shaft of *d* gives motion to the shaft of the blower, and by the crossed belt 14 rotation is given to the beater *m*, and by the belt 15 motion is given to the second beater, *n*.

I claim as my invention—

1. The combination, with the steel-toothed picker-cylinders *f g*, and strippers *h k*, of the two opening-cylinders *c d*, having hooked teeth, and acting with the cylinders *f* and *g*, respectively, and the feed-apron *a*, and feed-rollers *b b'*, substantially as set forth.

2. The combination of a pair of toothed feeding-rollers, *b b'*, an opening-cylinder, *c*, acting to open and comb the wool as delivered from the feed-rollers, a second opening-cylinder, *d*, acting with the cylinder *c* to open the wool, a grating beneath the cylinders *c d*, steel-toothed picking-cylinders *f g*, acting, respectively, with the cylinders *c* and *d*, and a brush to remove the fiber from the cylinders *f g*, substantially as specified.

3. In a fiber-cleaning machine, the combination, with the delivery-brush *l* and the trunk thereof, of a revolving beater acting upon the fiber, and a grating beneath the beater, substantially as set forth.

4. The combination, with the delivery-brush and spout or trunk in a fiber-cleaning machine, of a deflector in the trunk or spout of the brush, and a revolving beater that acts upon the fiber as it passes through said trunk, substantially as specified.

5. The combination, with the delivery-brush and trunk or spout, in a fiber-cleaning machine, of a deflector in the trunk of the brush,

a revolving beater, a screen or grating, and a closed box beneath the beater, substantially as set forth.

6. The combination, in a machine for removing foreign substances from wool or other fiber, of a feeding-belt, toothed feed-rollers, two hooked-tooth opening-cylinders, two steel-tooth picker cylinders and strippers, a delivery-brush, and a beater to act in succession upon the wool and open, brush, and clean the same, substantially as set forth.

Signed by me this 16th day of August, A. D. 1880.

S. R. PARKHURST.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.