2 Sheets—Sheet 1.

L. P. SUMMERS.

Machine for Making Fiber.

No. 202,766. Patented April 23, 1878.

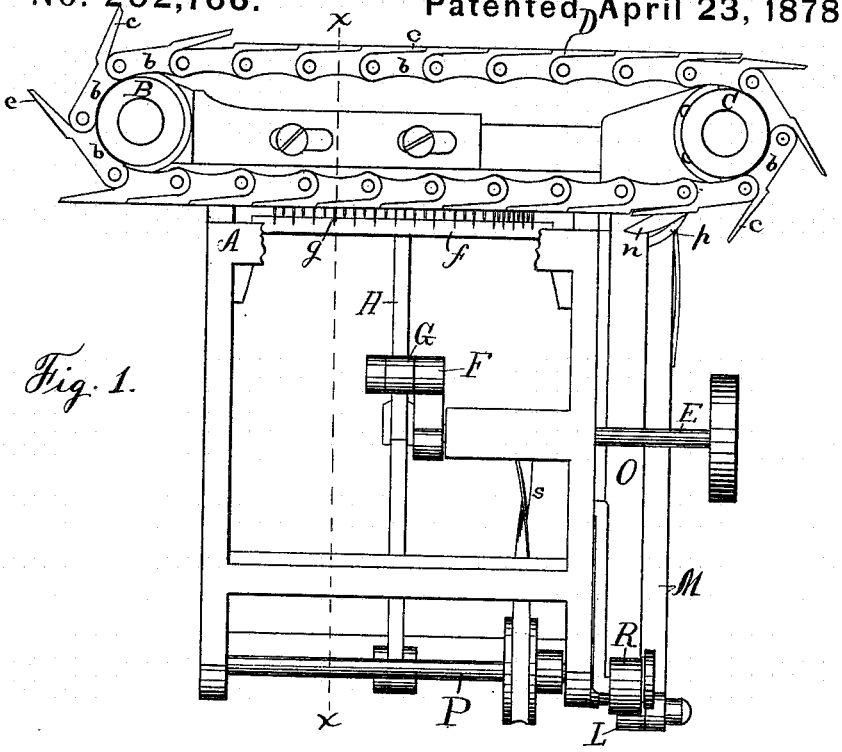

Fig. 1.

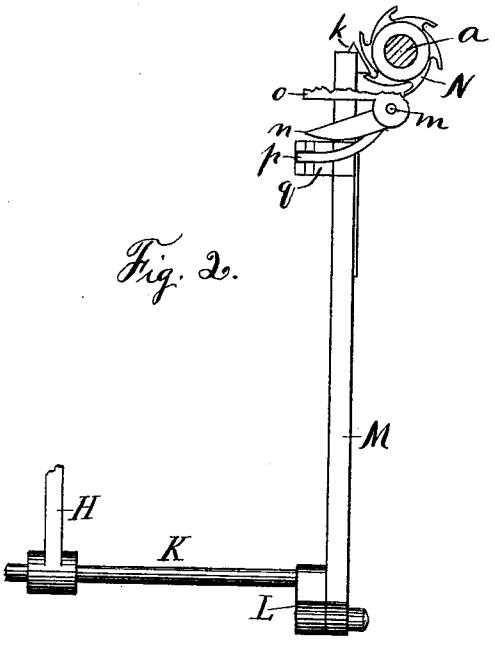

Fig. 2.

Witnesses.
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Lucius P. Summers.
By James Shepard Atty.

2 Sheets—Sheet 2.

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Fig. 3.

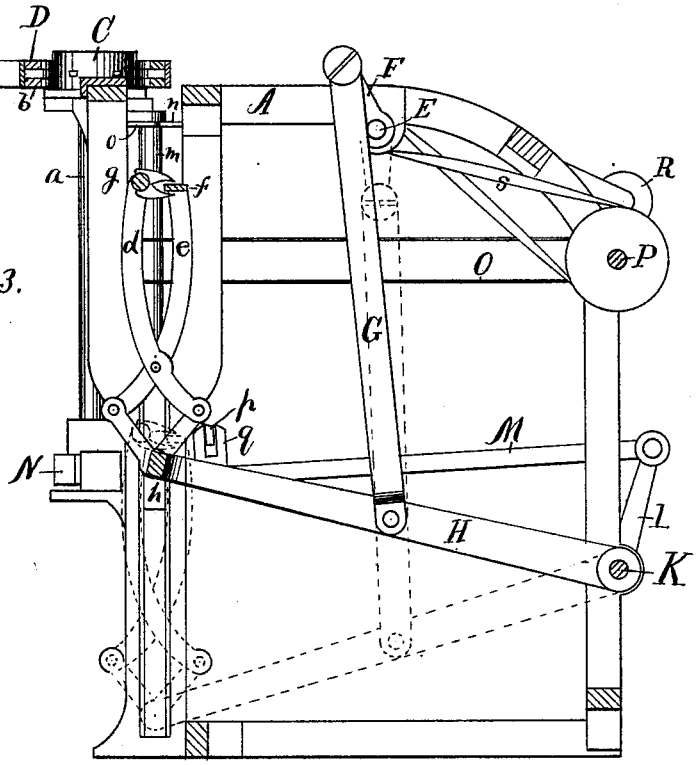
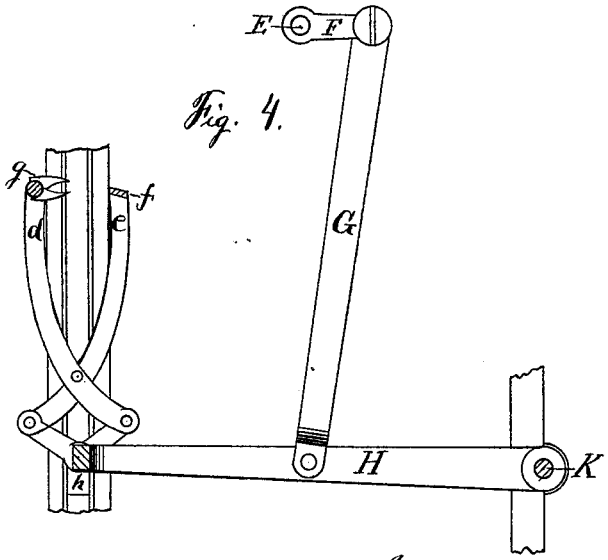


Fig. 4.



Witnesses.
James B. Thomson
James Thomson

Inventor.
Lucius P. Summers.
By James Shepard Atty.

UNITED STATES PATENT OFFICE.

LUCIUS P. SUMMERS, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR OF ONE-THIRD HIS RIGHT TO JOHN M. SPRING, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING FIBER.

Specification forming part of Letters Patent No. **202,766**, dated April 23, 1878; application filed March 22, 1878.

To all whom it may concern:

Be it known that I, LUCIUS P. SUMMERS, of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Reducing Material to Fiber or Threads, of which the following is a specification:

My invention consists of the peculiar construction of mechanism and devices and in the combination of parts, as hereinafter described.

In the accompanying drawing, Figure 1 is a plan view of a machine embodying my invention for reducing material to fiber. Fig. 2 is a plan view of detached parts thereof. Fig. 3 is a vertical section of said machine on line *x x* of Fig. 1, and Fig. 4 is a detached sectional view of the same.

My machine is principally designed for reducing palmetto-leaves to fiber or threads for upholstering purposes; but it is, of course, evident that any other material may be reduced to fiber upon the same machine.

A designates the frame of the machine, an upper cross-rail of which is represented as broken away in Fig. 1, in order to better show the other parts. At one end of the frame there are two vertical shafts, carrying wheels B C, of which the wheel C on shaft *a* is a sprocket-wheel. A peculiarly-constructed endless chain, D, is mounted on the wheels B C, said chain being formed of jointed links *b*, each of which bears a rigid arm, *c*, lapping over and folding upon the side of its adjoining link, so that when the chain is drawn taut the arms *c* are all compactly folded upon the links in the straight portions of the chain, as shown in Fig. 1; but that in turning around on the wheels B C the arms are thrown outward from the links, as also shown in said Fig. 1, thereby forming a chain with a series of jaws, which are automatically opened and closed in the act of moving around on two wheels. It should be noticed that the jaws, when closed, stand longitudinally to the chain, thereby carrying the leaves held by them edgewise.

The meeting sides of the jaws and links may be grooved longitudinally, to facilitate holding material between them. As is common in supporting endless chains, mechanism of some kind should be provided to enable the wheels to be spread apart more or less for adjusting the tension of the chain. An intermittent motion is given to the chain D by means hereinafter described.

E designates the main shaft, provided with a crank, F, connected by means of pitman G to the oscillating lever H on shaft K. Upon the end of the oscillating lever H is a cross-bar, each end of which is provided with a pair of tongs, the arms *d* of which tongs carry a series or gang of knives, *g*, and the other arms, *e*, carry a plain bar, *f*. The knives in the gang are all sharpened on their lower edge, and I prefer to place them with every alternate knife above, and every other alternate knife below, said bar, as shown in the drawings. The same pin which pins the arms of the tongs together also pins them to a sliding block, *h*, fitted to slide in proper ways or guides upon the inside of the post of the frame A. Any ordinary means may be employed to regulate the freedom or friction of the sliding block *h* within its ways.

When the lever H moves upward the jaws are thrown open, as shown in Fig. 4, and carried upward when thus opened. As the lever begins to descend, the friction of the sliding block holds said block stationary for a time, until the downward motion of the cross-bar on lever H throws the arms *d e* together, as shown by full lines in Fig. 3, and holds them together in making their downward movement into the position indicated by broken lines in Fig. 3.

Upon the crank-shaft K there is a crank, L, which actuates a reciprocating-bar, M. (See detached view, Fig. 2.) This bar carries a spring-actuated pawl, *k*, which engages the teeth of ratchet-wheel N and shaft *a*, whereby an intermittent rotating motion is imparted to said shaft and its sprocket-wheel, upon which the chain is mounted. By the side of the shaft *a* is another vertical shaft, *m*, Fig. 2, to the upper end of which a swinging shear-blade, *n*, is attached, the same working against a stationary blade, *o*, on the main frame and

just under the path of the chain D. Upon the lower end of the shear-shaft *m* is an actuating arm, *p*, the end of which rests in a slot formed in the end of an arm, *q*, on bar M. The shear-blade *n* and arm *p* are so attached to the bar M that the shears are open when the bar is drawn farthest away from the ratchet-wheel. By this arrangement the shears are closed when the bar is moving to get a fresh hold of the ratchet-wheel, and opened when the bar is withdrawn, and moves the ratchet-wheel, whereby the cutting of the shears will always take place when the chain D is at rest. Passing under the shears is an endless belt or apron, O, one end of which is mounted on a suitable driving-pulley on shaft P, to which motion may be imparted by suitable pulleys and belt *s*, connecting it with the main shaft.

The operation of the machine is as follows, viz: Motion is imparted to the main shaft in any ordinary manner, thereby giving an intermittent motion to the chain D. The leaves or material to be reduced are placed with their upper ends in the open jaws of the chain, and held by hand until the jaws close upon and hold them suspended from the chain. The frame of the machine is so shaped or cut away as to allow them to pass by unobstructed. When the leaves reach the tongs and stop, the knives *g* and bar *f* open and pass upward, one on each side of the leaves, to near the upper end of the same. Upon the descent of the tongs, they come together and force the knives through the leaves, the bar *f* holding the leaves in contact therewith, and the knives stripping the leaf into threads in making its descent. In rising again, they open so as to clear the leaf, the chain is fed along, and a new leaf comes into position to be stripped by the next downward movement of the knives, while the leaf before stripped may be combed in a new place, and so on until the leaf first put in has passed all the knives. The last few in the series may be set closer together than the rest, so as to reduce the leaves to threads as fine as may be desired. The leaves, after passing the knives, come in between the shears, which, by means before described, cut the reduced fiber from the stubs and let it fall on the endless apron O, which brings it to the other side of the machine. A pivoted presser-roller, R, rests upon the endless belt, to compress the fiber, so that it may be twisted as it leaves the apron, if desired.

I claim as my invention—

1. The endless chain D, formed of links *b* and arms *c*, operating to close upon each other, with their meeting faces in a longitudinal direction to the straight parts of the chain, substantially as described, and for the purpose specified.

2. The series of knives *g* and bar *f*, in combination with tongs or equivalent operating mechanism, substantially as described, whereby said bars and knives are held apart in making their upward movement, and together in making their downward movement.

3. The endless chain D, having jaws which open and close automatically by the movement of the chain, in combination with the series of knives *g* and bar *f* and their operating mechanism, substantially as described, and for the purpose specified.

4. The arms *d* and *e*, carrying knives *g* and bar *f*, in combination with the sliding block *h*, to which arms *d e* are pivoted, said block being fitted in suitable ways, and the oscillating lever H, with cross-arm connected to the arms of the tongs, substantially as described, and for the purpose specified.

5. The endless chain D, having jaws which open and close automatically, in combination with knives *g*, bar *f*, shears *n o*, and mechanism for operating the foregoing parts, substantially as described, and for the purpose specified.

6. The combination of the endless chain D, carrying holding-jaws, sprocket-wheel C, shaft *a*, ratchet-wheel N, reciprocating bar M, carrying spring-pawl *k*, and shear-blade *n*, connected to the bar M, all substantially as described, whereby the shears and chain are operated by means of a single bar to cut when the chain is at rest.

7. The combination of jaws, carrying the material to be reduced with an intermittent motion, the series of knives operating to reduce said material, the shears *n o*, and endless apron O, all provided with suitable operating mechanism, substantially as described, and for the purpose specified.

LUCIUS P. SUMMERS.

Witnesses:
JAMES SHEPARD,
P. J. MARKLEY.