R. H. PLASS.

Machinery for Cutting Pile Fabrics.

No. 222,732. **Patented Dec. 16, 1879.**

Fig 1.

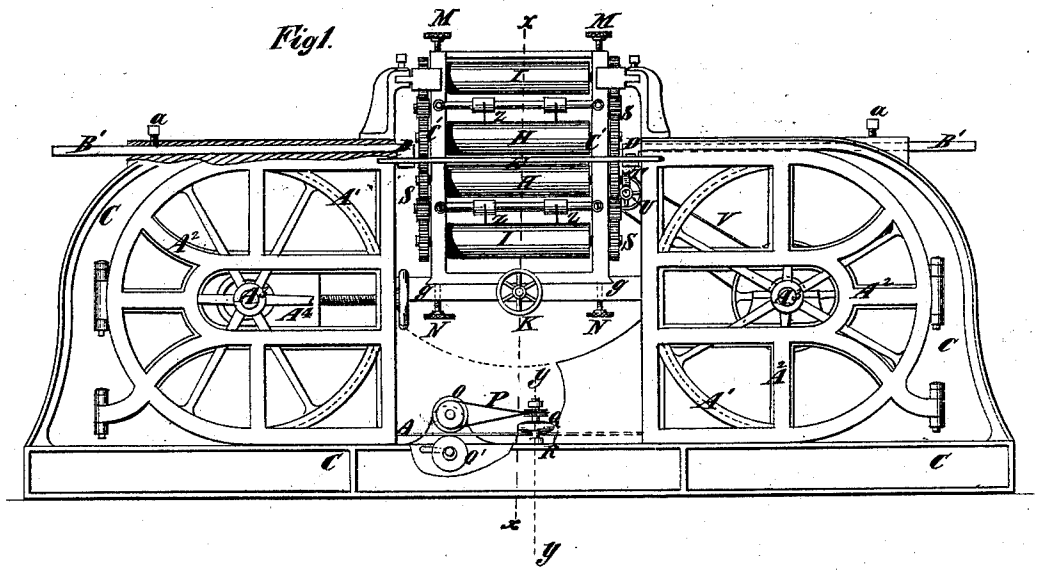


Fig 2.

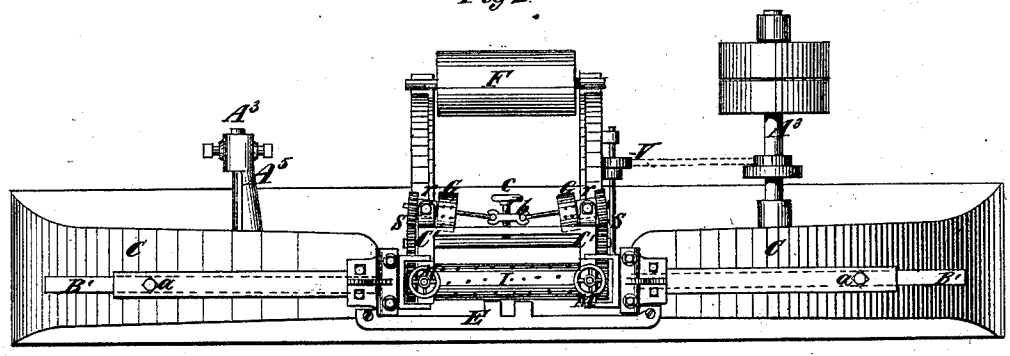


Fig 3.

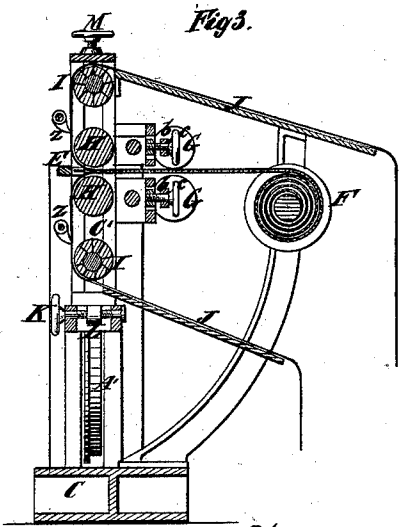


Fig 4.

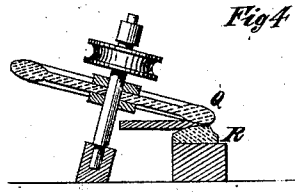


Fig 5.

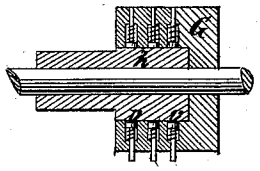
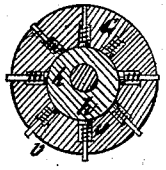


Fig 6.



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UNITED STATES PATENT OFFICE.

REUBEN H. PLASS, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND MYRON H. CHAPIN, OF SAME PLACE.

IMPROVEMENT IN MACHINERY FOR CUTTING PILE-FABRICS.

Specification forming part of Letters Patent No. **222,732**, dated December 16, 1879; application filed January 3, 1879.

To all whom it may concern:

Be it known that I, REUBEN H. PLASS, of the city, county, and State of New York, have invented certain new and useful Improvements in Machinery for Cutting Pile-Fabrics, of which the following is a specification.

The object of this invention is to enable pile-fabrics woven double with an intermediate pile to be cut apart with accuracy, leaving the pile uniform throughout the surface of both fabrics when severed.

The invention consists in the combination of an endless-band knife, mechanism for operating said knife, means for feeding material to the knife, rollers for stretching the fabric laterally before it is subjected to said knife, and mechanism for operating said rollers.

It also consists in the combination of an endless-band knife, mechanism for operating the same, rollers for feeding material thereto, rollers arranged at an angle to each other and capable of adjustment at different angles for the purpose of stretching the material laterally before it is subjected to the knife, and mechanism for driving the said feeding and stretching rollers.

It also consists in the combination, in a machine for cutting material, of a knife and rollers for feeding material thereto, provided with pins or fingers, eccentrics for adjusting said pins or fingers outwardly, and springs for adjusting them inwardly.

It also consists in the combination of an endless-band knife for separating material, means for imparting motion thereto, a cross knife or cutter for dividing the material longitudinally after it leaves said band-knife, and means for feeding material to said knives.

It also consists in the combination, with an endless-band knife and mechanism for operating the same, of an emery-wheel and a pulley deriving motion from said knife, whereby a rotary motion is imparted to said emery-wheel in approximately the same plane as that of the motion of the knife.

It also consists in the combination, with an endless-band knife, of a pulley deriving motion therefrom, and an emery-wheel rotated by said pulley acting on one side of the knife, and a stationary bed or base piece acting upon the other side thereof.

It also consists in combinations of parts and details of construction, to be hereinafter explained.

In the accompanying drawings, Figure 1 is a front view of a machine for cutting double pile-fabrics embodying my invention, a portion of the frame-work being removed. Fig. 2 is a plan or top view of the same, a portion of the framing being removed the better to illustrate the feeding-rollers. Fig. 3 is a transverse section through the line *x x*, Fig. 1. Fig. 4 is a transverse section of a portion of the knife-sharpening mechanism, taken through the line *y y*, Fig. 1. Fig. 5 is a central longitudinal section of one of the spreading or stretching rollers, showing its pins and the means for operating the same; and Fig. 6 is a transverse section thereof.

Similar letters of reference designate corresponding parts in all the figures.

A designates an endless-band knife, supported upon wheels or pulleys A′ journaled in bearings comprised in a frame-work, C, which may be of any suitable construction, but is preferably of such form as to inclose the said knife sufficiently to preclude its occasioning injury to the operator in case of its breakage or its sliding off the wheels, gates A^2 being provided to afford easy access to it. Preferably one of these wheels or pulleys A′ is supported upon the end of a shaft, A^3, arranged in a bearing, A^4, which is adjustable horizontally in a slideway in the frame C, and preferably such bearing A^4 has a rearward extension, A^5, containing a bearing for the rear end of the shaft A^3 of the said wheel or pulley A′, supported by it, and means for adjusting said bearing, so as to provide for tilting the wheel to cause the band-knife to run forward or backward to assume the proper position for work.

The knife is shown as supported in proximity to the fabric to be cut by guides D, arranged on the ends of bars B′, mounted in guideways in the frame-work C, (see Fig. 1,) and capable of longitudinal movement in said guideways, for the purpose of adjusting the guides D toward and from one another to suit different widths of material, and of being secured in place by set-screws *a*.

Where the machine is intended for very

wide fabrics, an intermediate guide, E, in rear of the knife and supporting its back edge, will be employed.

F designates a roller, upon which the double fabric to be cut is wound, and from whence it passes to the knife. The fabric may be fed to the knife from folds laid upon the floor, and merely pass over this roller.

G designates two rollers, by which the fabric, prior to coming into contact with the knife A, is stretched or spread apart laterally, so as to be strained into a horizontal plane, in order that it may be cut accurately throughout its extent, leaving a uniform length of pile on both the severed fabrics throughout their extent. These rollers are shown as consisting of two short cylinders supported on shafts which have their outer ends mounted in pivotal bearings *r*, supported in an adjustable secondary frame, C′, and are supported at their inner ends in a yoke, *b*, fitted to a screw, *c*, whereby it may be adjusted inward and outward, so as to set the rollers at a greater or less angle relatively to each other, for the purpose of directing and straining the selvages or edges of the fabric laterally apart before it reaches the knife.

Preferably these rollers G are duplicated on the under side of the fabric, as shown in Fig. 3. They are designed to be provided with fingers or pins adapted to be projected at the proper time to enter the fabric, and adapted to be withdrawn inwardly out of the fabric after having done their work, so as not to scratch the fabric by radial action. These pins or fingers are arranged in series, so as to extend radially through the rollers. Their inner ends abut against eccentric hubs *h* provided upon the outer bearings of their shafts, and arranged so that when the pins are brought opposite a certain portion of the hubs they will be forced outward so as to project beyond the surface of the rollers. These pins or fingers are designed to be drawn inwardly by springs, which may consist of elastic bands encircling the rollers and fastened to shoulders upon the pins; or, in lieu thereof, spiral springs *v* may be employed between shoulders upon the pins and other shoulders within the sockets in the rollers, so as to effect the desired result, as shown in Figs. 5 and 6.

H designates a pair of rollers, over which the two fabrics, after being severed by the knife, pass to two other rollers, I I, preferably provided with teeth similarly to the stretching-rollers G, and whereby the fabrics are fed over tables J J out of the machine. These rollers, as also the stretching-rollers, are supported in the secondary frame C′, which is arranged in suitable guides *g* in the main frame, and is capable of horizontal adjustment toward and from the edge of the knife by means of a screw, K, supported in bearings in the main frame and engaging with a nut, L, comprised in the secondary frame.

The rollers H I are supported in boxes arranged in housings in the secondary frame C′, and are capable of vertical adjustment toward and from the sides of the knife through screws M N, the latter of which passes through transverse slots in the guides of the secondary frame, so as to provide for the adjustment of the rollers from below, as well as above, without interfering with the shifting of the secondary frame.

The rollers G H I are driven in the proper direction to feed forward the fabric to be cut, and to discharge the fabrics after they are severed, by means of gear-wheels S, arranged upon their journals, and deriving motion from a worm-wheel, T, to which motion is transmitted by a worm, U. This worm U is arranged upon a shaft which derives motion, through a pulley and belt, V, from a pulley upon the shaft A^3 of the non-adjustable wheel or pulley A′, which constitutes the driving-shaft of the machine.

O designates a roller supported in bearings erected on the main frame C of the machine in such position as to be in proximity to the lower portion of the endless-band knife A. On its shaft is a pulley which, through a belt, P, transmits motion to a sharpening device consisting of a rotary emery or other wheel, Q, revolving in approximately the same plane as that of the motion of the knife, inclined relatively to the edge of the knife, and arranged so as to operate in conjunction with a bed or base piece, R, which may be made of the same material as the wheel, so that the two will sharpen the beveled edge of the knife as it passes between them.

O′ designates a roller arranged under the roller O and below the band-knife. It is supported loosely upon a shaft having eccentric journals supported in the main frame C, so that the shaft may be adjusted to force the roller against the band-knife and the band-knife against the roller O′, so as to be in contact therewith and impart motion thereto.

It will be seen that by this arrangement of mechanism I provide for sharpening the knife automatically during its operation.

If desirable, fabrics may be woven double, as above described, and with an intermediate selvage or portion at which the bodies of both fabrics are united. In such case a knife for cutting the fabrics longitudinally apart after their separation may be embodied in my machine—for instance, a knife similar to the knives Z, arranged in suitable position to do the requisite work as the fabrics pass it. A rotary knife or cutter could be advantageously employed in lieu thereof, if desirable.

It will be seen that by my invention I provide in a very simple manner for cutting a fabric woven with two bodies and an intermediate pile, so as to produce two fabrics with a uniform length of pile throughout their extent, and that therefore I cheapen and simplify the production of pile-fabrics.

It is obvious that the improvements are adapted for skiving leather and splitting various other materials.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of an endless-band knife, mechanism for operating said knife, means for feeding material to the knife, rollers for stretching the fabric laterally before it is subjected to said knife, and mechanism for operating said rollers, substantially as specified.

2. The combination of an endless-band knife, mechanism for operating the same, rollers for feeding material thereto, rollers arranged at an angle to each other and capable of adjustment at different angles for the purpose of stretching the material laterally before it is subjected to the knife, and mechanism for driving the said feeding and stretching rollers, substantially as specified.

3. The combination of the endless-band knife A, its supporting pulleys and guides, and the rollers G, supported on shafts arranged in outer pivotal bearings and inner adjustable bearings, substantially as specified.

4. The combination, in a machine for cutting material, of a knife and rollers for feeding material thereto, provided with pins or fingers, eccentrics for adjusting the said pins or fingers outwardly, and springs for adjusting them inwardly, substantially as specified.

5. The combination of an endless-band knife for separating material, means for imparting motion thereto, a cross knife or cutter for dividing the material longitudinally after it leaves said band-knife, and means for feeding material to said knives, substantially as specified.

6. The combination, with an endless-band knife and mechanism for operating the same, of an emery-wheel and a pulley deriving motion from said knife, whereby a rotary motion is imparted to said emery-wheel in approximately the same plane as that of the motion of the knife, substantially as specified.

7. The combination, with an endless-band knife and mechanism for operating the same, of a pulley deriving motion from said knife, and an emery-wheel rotated by said pulley acting on one side of the knife, and a stationary bed or base piece acting upon the other side thereof, substantially as specified.

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