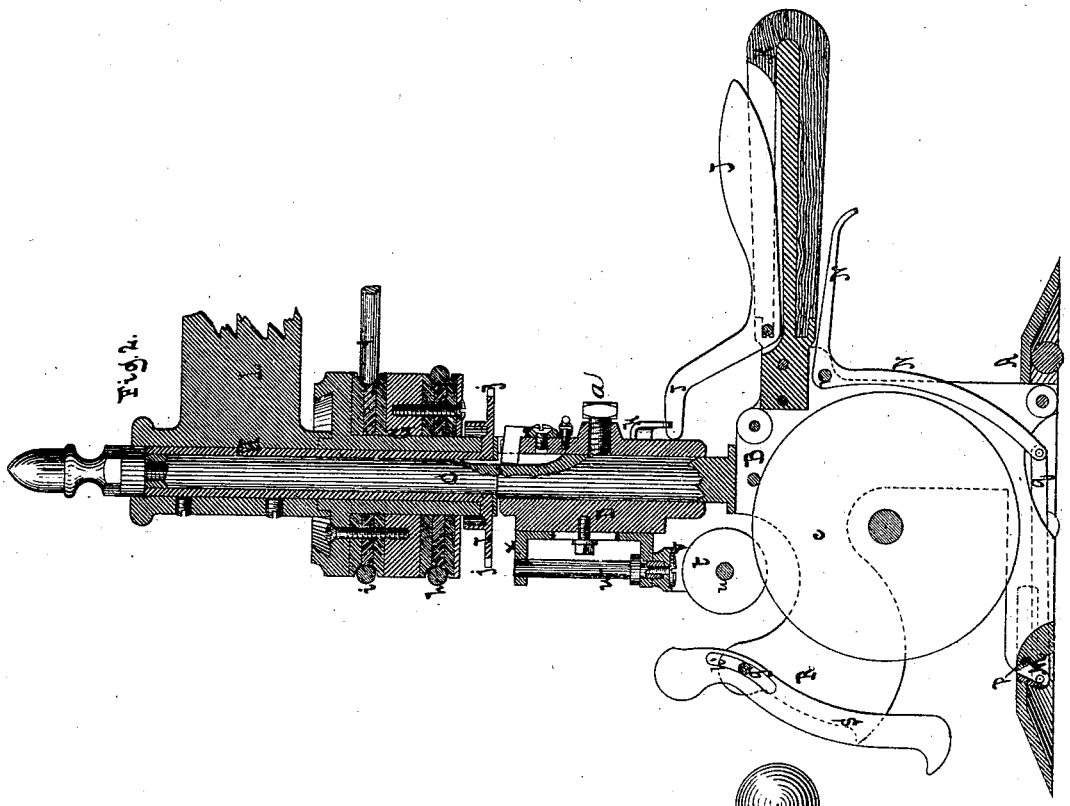
2 Sheets—Sheet 1.

A. WARTH.

CLOTH-CUTTING MACHINE.

No. 186,643. Patented Jan. 23, 1877.

Fig. 2.



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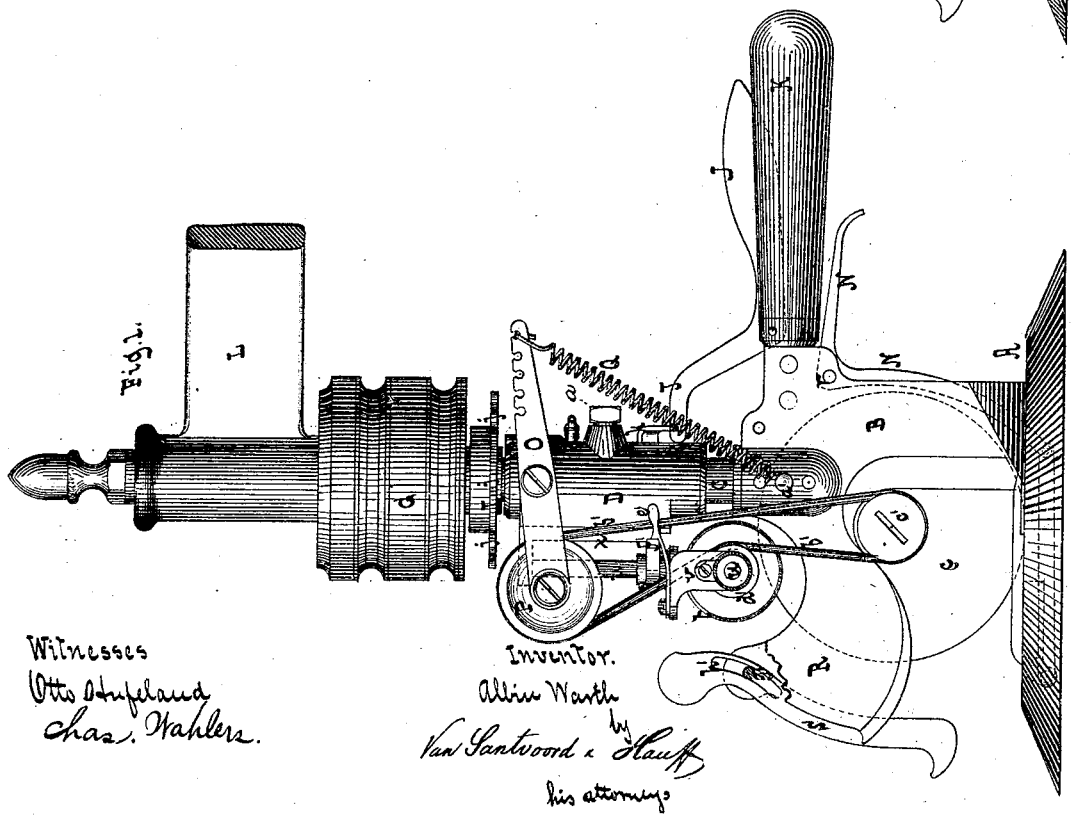

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by
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2 Sheets—Sheet 2.

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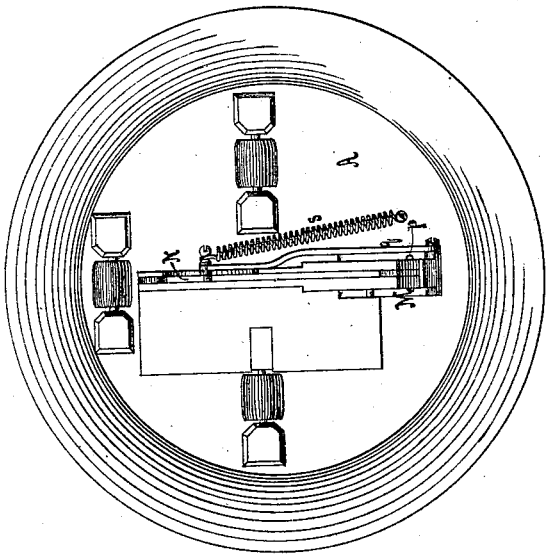

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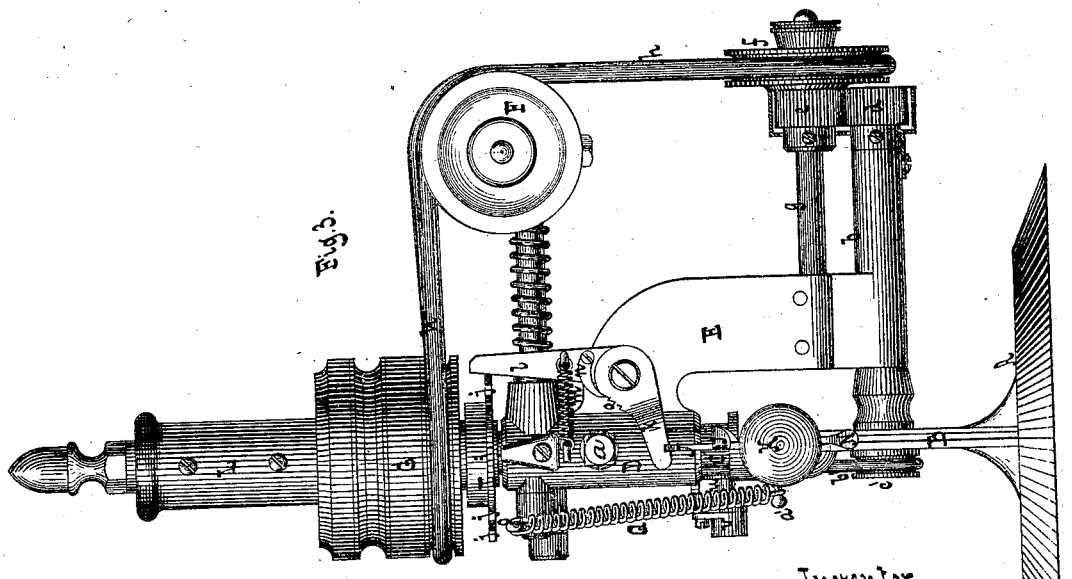

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UNITED STATES PATENT OFFICE.

ALBIN WARTH, OF STAPLETON, NEW YORK.

IMPROVEMENT IN CLOTH-CUTTING MACHINES.

Specification forming part of Letters Patent No. **186,643**, dated January 23, 1877; application filed November 16, 1876.

To all whom it may concern:

Be it known that I, ALBIN WARTH, of Stapleton, in the county of Richmond and State of New York, have invented a new and useful Improvement in Machines for Cutting Textile and other Material, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a side view. Fig. 2 is a vertical section. Fig. 3 is a front view. Fig. 4 is an inverted plan.

Similar letters indicate corresponding parts.

This invention relates to certain improvements on that class of machines for cutting textile and other materials, in which a rotating disk-knife is combined with a foot-plate and with a driving-gear, so that the foot-plate, together with the cutting mechanism, can be moved and turned in any desired direction without throwing the knife out of gear with the driving mechanism.

My present improvement consists in the combination of a stop mechanism with the handle which serves to govern the direction of the cutting apparatus and with the driving-gear of the rotating disk-knife, so that, whenever the handle is released, the stop mechanism is thrown in gear and the cutting mechanism is prevented from being jerked round by its driving-gear, thereby preventing damage to the goods to be cut, and to the hands or limbs of the person attending to the machine; also, in the combination, with the foot-plate and with the rotating disk-knife, of a lifter connected to a hand-lever, so that in cutting a pile of goods of a certain thickness the lowest layer in the pile can be cut to the same point to which the uppermost layer is cut; further, in the combination, with the swivel-bracket which forms the bearings for the shaft of the grinding-disks, and with the belt which imparts motion to the grinding-disks, of a tension mechanism and of a latch, which serves to retain the grinding-disks out of contact with the knife, and which, when released, allows said grinding disks to act on the knife without throwing the belt which imparts motion to the grinding-disks out of gear; also, in the combination, with the pulley which imparts motion to the rotating disk-knife, of two shafts, which are geared together by pinions, so that the pulley is raised sufficiently above the surface of the foot-plate to clear the pile of goods to be cut; further, in the combination, with the foot-plate, with the disk-knife, and with its protector, of a foot, which can be adjusted in the protector according to the thickness of the pile to be cut, and which serves to hold down the top layer of said pile and to indicate the direction of the cut.

In the drawing, the letter A designates the foot-plate, from which rises a standard, B, the upper portion of which forms a round pin, C, on which is fitted a sleeve, D, which is secured in the desired position by a set-screw, *a*. From this sleeve extends a hanger, E, which forms the bearing for an arbor, *b*, on one end of which is mounted the disk-knife *c*, while on its opposite end is secured a pinion, *d*, which gears in a pinion, *e*, that is firmly secured to a pulley, *f*, and revolves, together with said pulley, on a pin, *g*, extending from the hanger E, and running parallel to the arbor *b*. The object of this arrangement is to elevate the pulley *f* above the foot-plate A, so that the same will not interfere with the operation of cutting.

It will be seen that the thickness of the pile of goods to be cut is limited by the elevation of the arbor *b* above the foot-plate, and if the pulley *f* is mounted directly on said arbor, the thickness of the pile of goods will be limited by the elevation of the lower edge of said pulley above the level of the foot-plate; and since the diameter of the pulley must necessarily be much larger than that of the pinion *d*, I am enabled to cut through piles of greater thickness by mounting said pulley on the pin *g* above the arbor *b*.

The pulley *f* receives its motion by a belt, *h*, which extends over guide-pulleys F to and round a pulley, G, which turns loosely on the upper part of the pin C, and which receives motion from the driving-gear by means of a belt, *i*.

By referring to Fig. 2 of the drawing it will be noticed that the pulley G is not mounted directly on the pin C; but it turns loosely on a tube, H, which is slipped over the pin C, and on the lower end of which is firmly secured a disk, I, with spurs *j*.

On the side of the hanger E is pivoted a bell-crank lever, *k l*, the vertical arm *l* of which is held in gear with the spur-disk I by means of a spring, *m*, while its other arm, *k*, bears upon a lever, J, that is mounted in a recess in the handle K, by means of which the cutting mechanism is guided. The tube H extends up through an eye at the end of the arm L, that connects the cutting mechanism with the driving gear, and is firmly secured to the tube by means of set screws. When the hand grasps the handle K the lever J is depressed into its recess, and the bell-crank lever *k l* is thrown out of gear with the spur-disk I, so that the cutting mechanism can be freely turned in the tube H; but as soon as the hand releases the handle K the bell-crank lever *k l* drops in gear with the spur-disk, and the cutting mechanism is prevented from being turned around. By this arrangement I prevent the cutting mechanism from being jerked round whenever the pulley should run fast on its bearings.

As the diameter of the disk-knife *c* decreases, or whenever another knife of different diameter is secured on the arbor *b*, the sleeve D has to be raised or lowered on the pin C of the standard B, and any change of this kind will disturb the correct relation between the lever J in the handle, the bell-crank lever *k l*, and the spur-disk I. In order to be able to restore this relation, the arm *k* of the bell-crank lever is made separate from the arm *l*, both being mounted on the same pivot. On the arm *l* is secured a dog, *n*, which engages with ratchet-teeth *o* in the edge of the arm *k*, so that the angle between these two arms can be changed, and said arm *k* can always be adjusted in such a position that by taking hold of the handle K the arm *l* will be thrown out of gear with the spur-disk I, and when the handle is released the arm *l* will be thrown in gear with said spur-disk by its spring *m*.

In cutting with a disk-knife through a thick pile of cloth or other material, said knife enters farther into the top layer than into the bottom layer—that is to say, if a line is marked on the top layer, and the knife has cut through to this line, the cut in the bottom layer does not reach up to the same line; and it has not heretofore been possible to cut out sharp corners with the disk-knife. This difficulty I have obviated by the following mechanism: In the front plate is a slot, for the reception of a forked lifter, M, which straddles the disk-knife and the knife-receiving socket, and which swings on a pivot, *p*. This lifter connects, by a rod, *q*, with a lever, N, that has its fulcrum on a pivot, *r*, in the standard B, and extends under the handle K, so that it can be easily operated by the hand which grasps said handle. A spring, *s*, has a tendency to throw the lifter down flush with the surface of the foot-plate. When the cutting mechanism has been advanced, so as to cut the top layer of a pile to any desired point, the further advance of the cutting mechanism is stopped; and by pressing against the lever N the lifter M is raised up, and thereby the cut in all the layers of the pile is brought to the desired point.

With the rotating disk-knife is combined a sharpening mechanism, which consists of two grinding-disks, *t t*, mounted on an arbor, *u*, and situated on opposite sides of the knife. The arbor *u* has its bearings in a bracket, *v*, secured to the lower end of a pin, *w*, which swivels in a bracket, *x*, that is fastened to the side of the sleeve D, and can be adjusted up or down by means of a set-screw. (See Fig. 2.) To the sleeve D is pivoted a lever, O, in one end of which is mounted a pulley, P, while its other end is provided with notches, to receive a spring, Q, which is hitched to a pin, *a'*, secured in the pin C. From said pulley extends a belt, *b'*, round a pulley, *c'*, mounted on the end of the knife-arbor, and one strand of this belt bears against a pulley, *d'*, secured on the arbor *u* of the grinding-disks.

By referring to Fig. 1 of the drawing it will be seen that the belt *b'* is kept taut by the spring Q, and by the pressure of said belt on the pulley *c'* the pin *w* turns in its bearings, and the working-surfaces of the grinding-disks are brought in contact from opposite sides with the disk-knife. As this knife revolves, the grinding-disks also receive a revolving motion, and the cutting-edge of the knife is kept sharp.

By changing the position of the spring in the lever O the tension of the belt *b'* can be regulated, and the grinding-disk can be made to act on the knife with more or less power.

On the bracket *v* is secured a spring-latch, *e'*, which can be made to engage with a stud, *f'*, fastened in the bracket *x*, and which, when thrown in gear with this stud, retains the grinding-disks out of contact with the knife. By these means the grinding-disks can be thrown in or out of operation at any moment, and the force with which the same are made to act on the knife can be increased or diminished to suit circumstances.

From the standard B extend two jaws, which form the protector R. Between these jaws is placed a foot, S, which is secured in position by a set-screw, *g'*, and which can be adjusted up or down by means of a slot, *h'*, (see Fig. 2,) so that it bears with a gentle pressure upon the top layer of the pile of goods to be cut, and serves to keep this top layer smooth in front of the knife. This foot also indicates the direction in which the knife cuts, and it enables the attendant to guide the cutting mechanism exactly in the desired direction.

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

1. The combination of a stop mechanism, substantially such as herein described, with the handle which serves to govern the direction of the cutting apparatus, and with the driving-gear of the rotating disk-knife, for

the purpose of preventing the cutting mechanism from being jerked round, substantially as set forth.

2. The combination, with the foot-plate and with the rotating disk-knife, of a lifter connected to a hand-lever, for the purpose of lifting the pile and cutting the lowest layer in the pile to the same point to which the uppermost layer is cut, substantially as described.

3. The combination, with the swivel-bracket which forms the bearings of the shaft of the grinding-disks, and with the belt which imparts motion to said grinding-disks, of a tension mechanism and of a latch, for the purpose of controlling the action of the grinding-disks, substantially as set forth.

4. The combination, with the pulley which imparts motion to the rotating disk-knife, and with the foot-plate which supports the cutting mechanism, of two shafts which are geared together by pinions, for the purpose of raising the pulley above the surface of the foot-plate, substantially as described.

5. The combination, with the foot-plate, with the disk-knife, and with the protector, of a foot which can be adjusted in the protector according to the thickness of the pile to be cut, and which serves to hold down the top layer of said pile, and to indicate the direction of the cut, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 13th day of November, 1876.

ALBIN WARTH. [L. S.]

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.