2 Sheets—Sheet 1.

A. WARTH.

MACHINES FOR CUTTING TEXTILE MATERIALS.

No. 182,498. Patented Sept. 19, 1876.

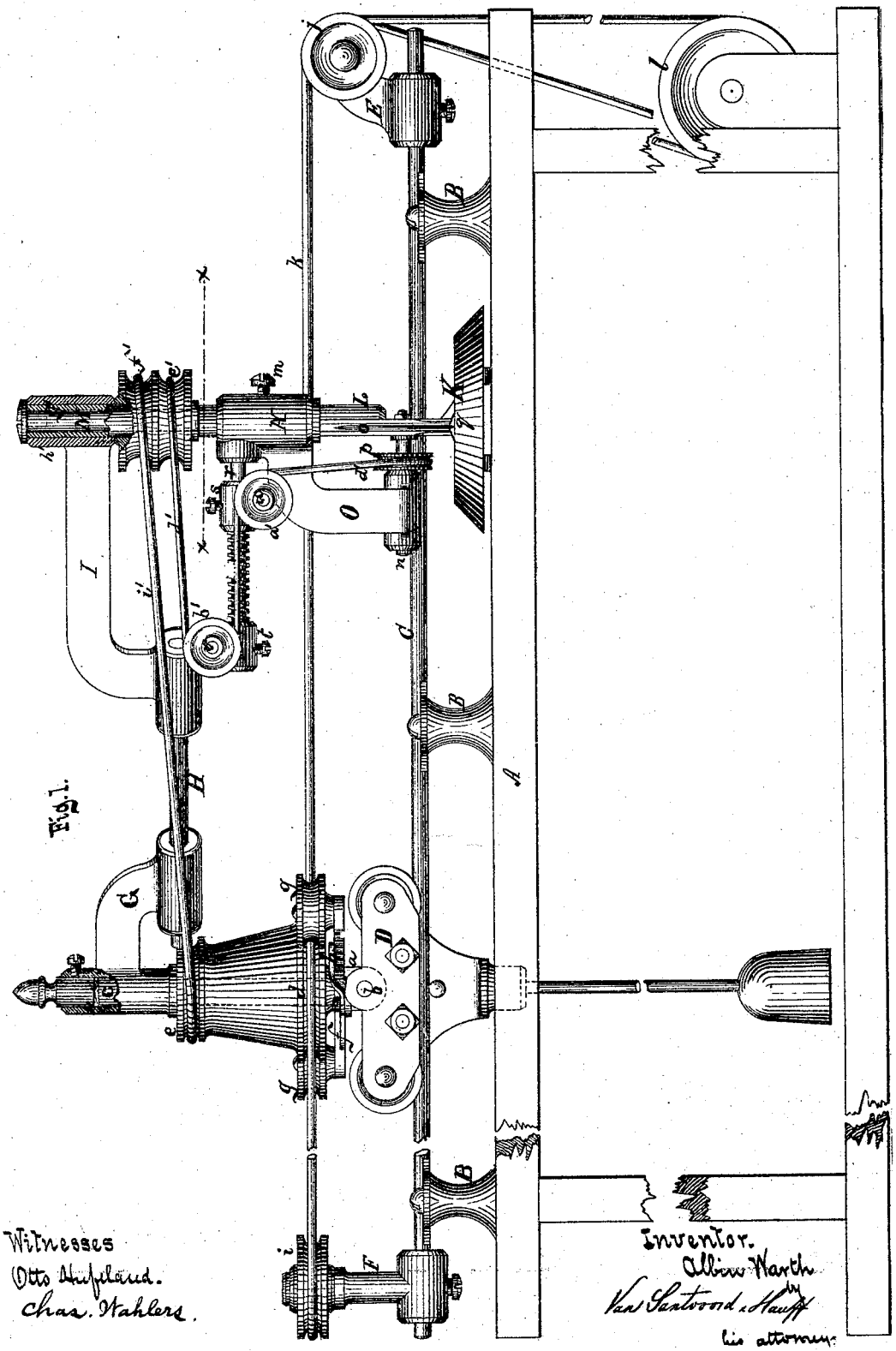

Fig. 1.

Witnesses
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Inventor.
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his attorneys

2 Sheets—Sheet 2.

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Fig. 2.

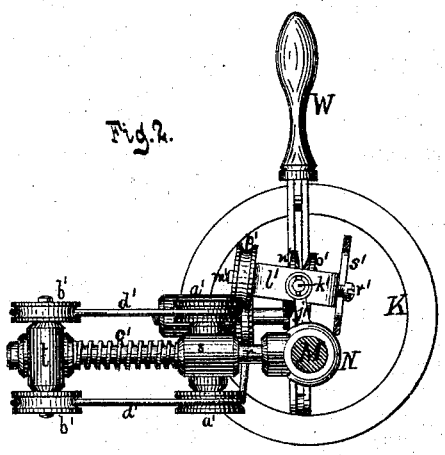


Fig. 3.

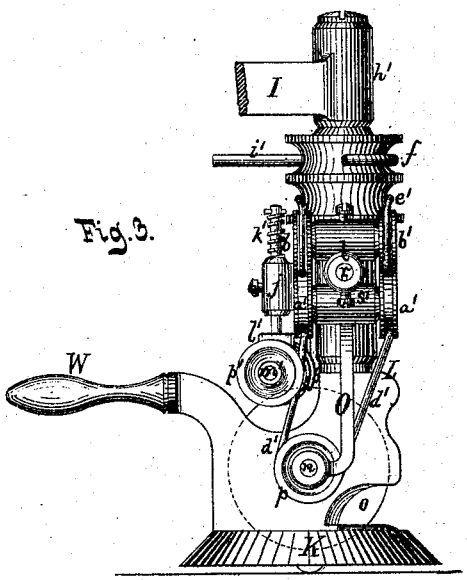
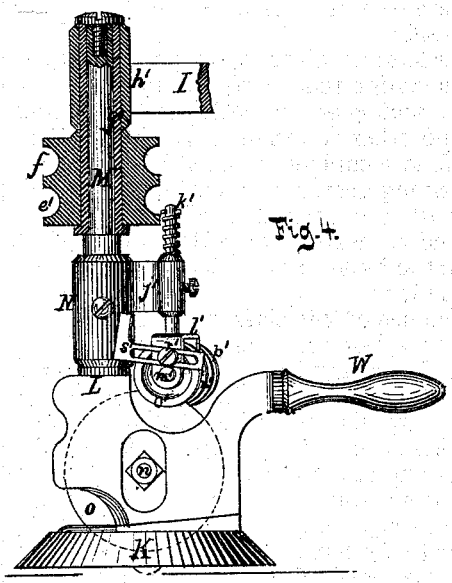


Fig. 4.



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Otto Stufeland

Chas. Wahlers.

Inventor

Albin Warth

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his attorneys.

UNITED STATES PATENT OFFICE.

ALBIN WARTH, OF STAPLETON, NEW YORK.

IMPROVEMENT IN MACHINES FOR CUTTING TEXTILE MATERIALS.

Specification forming part of Letters Patent No. **182,498**, dated September 19, 1876; application filed August 18, 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 Materials, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a front view, partly in section. Figure 2 is a horizontal section of the cutter-head in the plane *x x*, Fig. 1. Figs. 3 and 4 are elevations of the cutter-head from different sides.

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 every direction without throwing the knife out of gear with the driving mechanism.

In machines of this class, as heretofore constructed, the requisite motion is imparted to the knife by gear-wheels, and in most machines of this class the shafts which carry these gear-wheels, and which have to make from eighteen hundred to two thousand revolutions per minute, are liable to run fast from time to time, and then the knife is jerked round, causing damage either to the goods to be cut or to the hands or limbs of the person attending to the machine.

These disadvantages I have overcome by my present improvements, which consist in the combination of a system of pulleys and belts with the rotating disk-knife and with the driving mechanism, so that when either of the several shafts runs fast the cutting mechanism remains stationary, and all damage is avoided. The knife is covered by a protector on both sides and in front, so that the attendant is not liable to cut his fingers. With the knife are combined two grinding-disks, situated on opposite sides of said knife in oblique positions, and mounted on a shaft which receives a revolving motion, so that by the combined action of the two grinding-disks the cutting-edge of the knife is always kept in proper working condition. The driving mechanism consists of a traveling carriage, which allows of moving the cutter-head in any direction with ease and facility. The knife and certain of the pulleys for imparting motion to the same are connected to one and the same sleeve, which is adjustable on a standard rising from the foot-plate, so that said pulleys preserve their proper relation when the knife is raised or lowered.

In the drawing, the letter A designates the table on which the material to be cut is placed. On this table are secured brackets B, which support the guide-rails C of the carriage D. In this carriage is secured a head, *a*, which swings on a pivot, *b*, and from which rises a pin, *c*, that forms the bearing for a double pulley, *d e*, and for an arm, *f*, on which are mounted two pulleys, *g g*, and in one side of which are formed ratchet-teeth, which engage with a pawl, *h*, pivoted to a bracket which extends from the head *a*. On the ends of the guide-rail C are secured standards E F, and the standard F forms the bearing for a vertical shaft bearing a pulley, *i*, while the standard E forms the bearing for a horizontal shaft, on which are mounted two pulleys, *j*, and a belt, *k*, extends from the driving-pulley *l* over the pulleys *j* and round the pulley *i*. This belt bears from opposite sides against the lower speed *d* of the double pulley *d e*, and by turning the arm *f* the pulleys *g g* are caused to bear against said belt, so as to increase its contact with the pulley *d* to any desired extent, and to cause said pulley to revolve, whatever the position of the carriage D may be. On the upper end of the pin *c* is mounted a swivel-arm, G, which connects by a rod, H, and arm I with the cutting mechanism. This cutting mechanism consists essentially of a foot-plate, K, from which rises a standard, L, the upper portion of which forms a round pin, M, on which is secured a sleeve, N, which is secured in the desired position by a set-screw, *m*. From this sleeve extends a hanger, O, which forms the bearing for an arbor, *n*, on which are mounted the disk-knife *o* and a pulley, *p*. The standard L is made in two parts, between which the knife is placed, so that said knife is fully protected, and all danger that the attendant may cut his fingers is

avoided, and at the same time the material to be cut is prevented from crowding against the sides of the knife during the operation of cutting. In the foot-plate K is a knife-receiving socket, *q*, with sharp edges, which cooperate with the knife, and serve to facilitate the operation of cutting. From the sleeve N extends a rod, *r*, in a horizontal direction, and on this rod are secured two brackets, *s t*, which form the bearings for the shafts *u v*, on each of which are mounted two pulleys, *a' b'*, respectively.

The bracket *t* is mounted loosely on the rod *r*, and it is exposed to the action of a spring, *c'*, which serves to keep the belt *d'* taut. This belt extends from a pulley, *e'*, round the pulleys *b'*, and over the pulleys *a'*, down to the pulley *p* on the arbor *n* of the knife *o*.

In the example shown in the drawings the pulley *p* is placed close to the knife; but it may be placed on the outer end of the knife-shaft, and in this case the belt *d'* can be run down direct from the pulleys *b'*, and the pulleys *a'* can be dispensed with.

With the pulley *e'* is firmly connected another pulley, *f'*, and both these pulleys are mounted loosely on a tube, *g'*, which fits over the pin M, rising from the standard L, and into an eye, *h'*, formed at the outer end of the arm I. The pulley *f'* connects by a belt, *i'*, with the pulley *e* on the pin *c*, which rises from the head *a* on the carriage D.

From the sleeve N extends a bracket, *j'*, through the outer end of which extends a vertical rod, *k'*, on which is secured a yoke, *l'*, which forms the bearings for a shaft, *m'*. This shaft runs in a direction oblique to the arbor of the knife *o*, and on it are mounted two grinding-disks, *n' o'*, and a pulley, *p'*. The grinding-disks are on opposite sides of the knife, and they receive a revolving motion by the action of the belt *d'* against the pulley *p'*.

By employing two grinding-disks on opposite sides of the knife, the cutting-edge of said knife is automatically kept in the proper working condition, and the necessity of stopping the operation of cutting for the purpose of sharpening the knife is entirely avoided.

The yoke *l'* is adjusted in the required position by a slotted gage, *s'*, which may be secured adjustably thereto by a set-screw, *r'*, the end of this gage bearing against the sleeve N. By this means the grinding-disks can be set so as to act on the knife to the best possible advantage.

A handle, W, attached to the standard L, serves to guide the cutting mechanism.

From this description it will be seen that the pulleys *e' f'* revolve loosely on a tube, which fits over the pin M, rising from the standard L of the cutting mechanism; and in case the pulleys should run hot and fast on said tube, the tube will revolve on the pin M, and the cutting mechanism is not liable to be jerked round violently.

Furthermore, by using belts instead of cog-wheels for transmitting motion to the disk-knife *o* a steady motion is obtained, and the danger is avoided that the motion of the knife shall be stopped by threads or other impurities catching in the cog-wheels; and, by combining with the rotating disk-knife and its attachments the belt *k* and carriage D, said knife can be moved in any desired direction over the table A, and a rotating knife can be employed for cutting out patterns for garments or other articles with the same, or nearly the same, advantage as a reciprocating knife.

By means of the peculiar arrangement of the carriage D, the cutting mechanism can be pushed backward or forward, and in some cases the carriage moves either in one or in the opposite direction, without disturbing the movement of the knife.

It will also be noticed that the sleeve N supports all the pulleys *p a' b'* and the knife *o*, so that when the cutting mechanism is turned round, the pulleys preserve their proper relation toward each other and toward the pulley *e'*, and when the knife has to be raised or lowered the driving-gear is not disturbed.

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

1. In a machine for cutting textile and other materials, the combination of a pulley, *e*, swivel-arm G H I, belt *i'*, pulleys *f' e'*, belt *d'*, pulleys *b' p*, disk-knife *o*, and foot-plate K, with its standard L, all constructed and operating substantially in the manner shown and described.

2. The combination, with the pulleys *e' f'*, standard L M, and disk-knife *o*, of a tube, *g'*, fitting loosely over the pin M and into the pulleys *e' f'*, substantially as and for the purposes set forth.

3. The combination of the carriage D, belt *k*, pulleys *e d*, swivel-arm G H I, pulleys *e' f' b' p*, standard L, disk-knife *o*, and foot-plate K, all constructed and operating substantially as and for the purpose shown and described.

4. The protector L, enveloping the disk-knife *o* except at the grinding and cloth-cutting points, substantially as and for the purpose set forth.

5. The grinding-disks *n' o'*, arranged on opposite sides of the disk-knife *o*, and mounted on a shaft running in a direction oblique to that of the knife-arbor, substantially as set forth.

6. The combination, with the sleeve N, standard L M, disk-knife *o*, and foot-plate K, of a hanger, O, which forms the bearing for the knife-shaft, and of a rod, *r*, which supports pulleys *b'*, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 16th day of August, 1876.

ALBIN WARTH. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.