

F. J. CLARK.
CLOTH CUTTING MACHINE.
APPLICATION FILED AUG. 31, 1911.

1,051,685.

Patented Jan. 28, 1913.

2 SHEETS-SHEET 1.

Fig. 1.

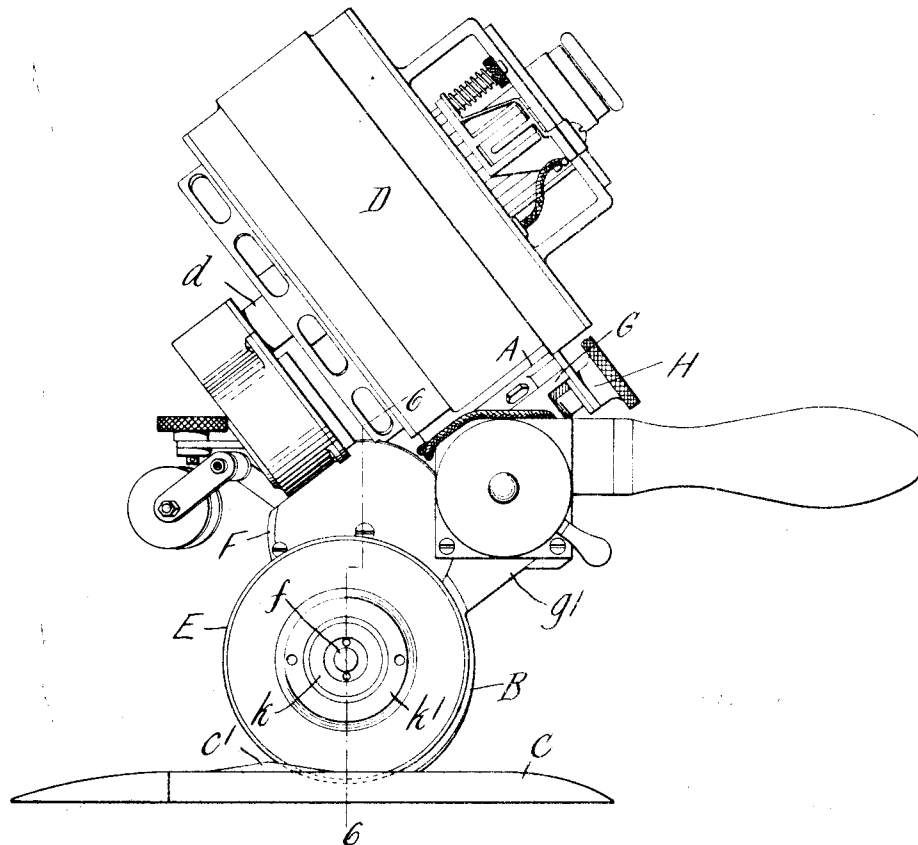
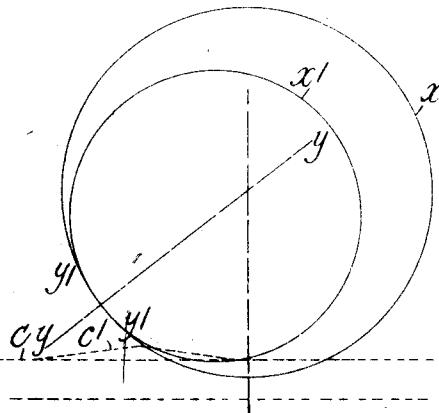


Fig. 2.



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2 SHEETS—SHEET 2.

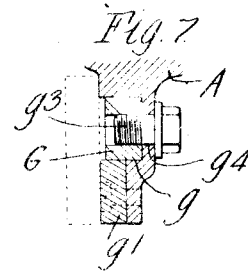
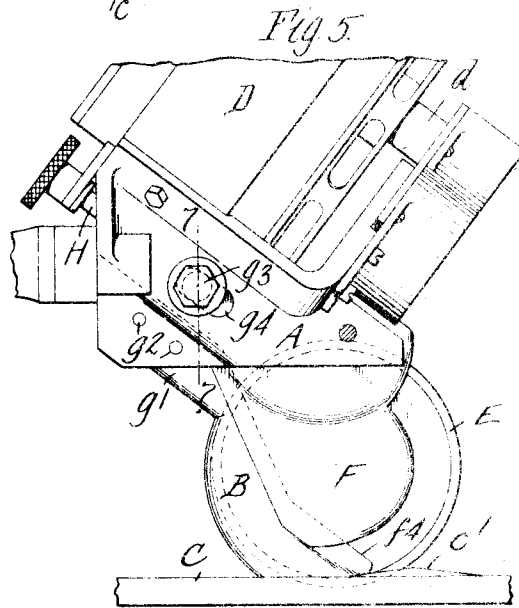
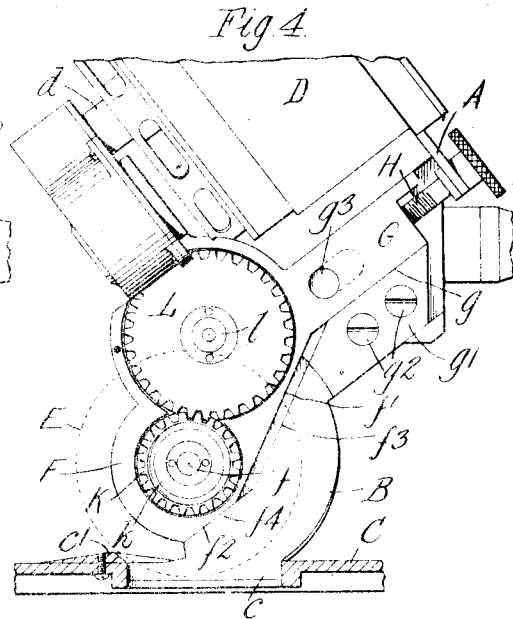
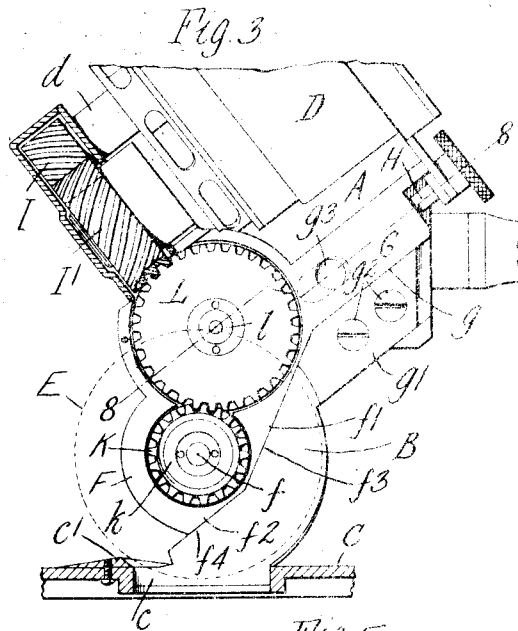
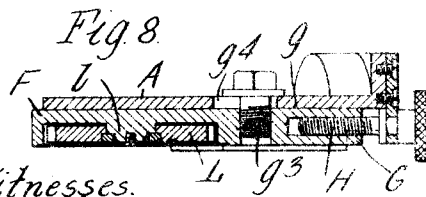
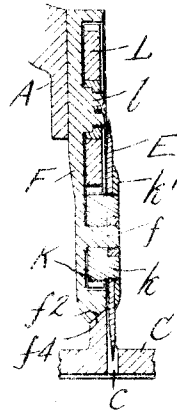
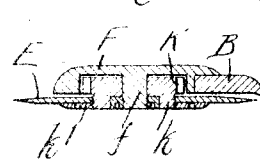


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK J. CLARK, OF BUFFALO, NEW YORK, ASSIGNOR TO EASTMAN MACHINE COMPANY, OF BUFFALO, NEW YORK.

CLOTH-CUTTING MACHINE.

1,051,685.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed August 31, 1911. Serial No. 647,049.

To all whom it may concern:

Be it known that I, FREDERICK J. CLARK, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Cloth-Cutting Machines, of which the following is a specification.

This invention relates to improvements in cloth cutting machines of that type which have a traveling cutter carriage provided with a driven rotary cutting knife.

One object of the invention is to provide a machine of this type of simple and compact construction in which the rotary cutting knife is so mounted on the carriage that it can be readily adjusted to different positions relative to the base of the machine and the material to be cut so that, as the cutting edge of the knife becomes worn, the knife can be advanced to take up this wear and bring its cutting edge into proper cutting position.

A further object of this invention is to provide driving means for the rotary knife which will retain operative engagement with the knife in its various adjusted positions without requiring any change or adjustment thereof.

In the accompanying drawings: Figure 1 is a side elevation of a cloth cutting machine embodying the invention. Fig. 2 is a diagrammatic view showing the position of the cutting knife when adjusted. Fig. 3 is a fragmentary side elevation of the machine on an enlarged scale, portions of the gear casings and the knife being removed to show the driving gears. Fig. 4 is a similar view showing the knife in an adjusted position. Fig. 5 is a fragmentary elevation of the opposite side of the machine. Fig. 6 is a vertical cross section in line 6—6, Fig. 1. Fig. 7 is a fragmentary section in line 7—7, Fig. 5. Fig. 8 is a cross section in line 8—8, Fig. 3. Fig. 9 is a horizontal cross section of the knife and its bearing.

Like reference characters refer to like parts in the several figures.

The cloth cutting machine shown is an electrically driven rotary knife machine and comprises a suitable frame A, carried by a standard B which is mounted on a movable base C having the usual slot *c* in which the lower edge of the rotary knife travels, and the usual throat plate *c'* at the front end of this slot. In the frame A is mounted a suit-

able electric motor D having a drive shaft *d* which operates to drive the rotary cutting knife E. All of these parts may be of any suitable and desired construction, the present invention relating to the manner in which the rotary knife is adjustably mounted on the frame of the machine and is connected with the motor.

F represents a supporting plate or knife carrier having a stub axle *f* projecting from one side thereof upon which the knife E is mounted in the manner hereinafter described. This knife carrying plate F is adjustably mounted on the frame A, so that the plate and its knife may be moved toward and from the throat plate *c'* in a direction at an inclination to the base of the machine. As the knife becomes worn, it may thus be adjusted downwardly and forwardly to bring its cutting edge into proper cutting position relative to the throat plate and the material to be cut. Any suitable means may be employed for adjustably mounting the knife carrying plate on the machine. In the construction shown the knife carrying plate has inclined rear and bottom walls *f'* and *f''* and the standard B is partially cut away at one side to form a recess having similarly inclined rear and bottom walls *f''* and *f'''*, and the knife carrying plate sets in this recess with its bottom wall *f''* resting on the wall *f'''* of the standard and its inclined rear wall *f'* in engagement with the rear wall *f''* of the standard when the knife plate is in its rearmost position. On its upper rear edge the plate F is provided with an inclined rearwardly extending arm G which slidably engages in a similarly inclined channel *g* in the side of the frame A. In the particular form of construction shown, the lower wall of the channel *g* is of less thickness than its upper wall and the standard B has a rearwardly inclined arm *g'* parallel with the arm G which is secured to the frame A by bolts *g''* and forms the outer portion of the lower wall of the channel *g*. This makes a strong and compact construction, but the channel *g* may be formed in any other suitable manner in the frame or in the standard of the machine or between them.

The arm G is secured to the frame A by a bolt *g''* and the frame is provided on the rear side of its channel with a slot *g'''* through which this bolt passes, so as to per-

mit of endwise movement of the arm G in the channel when the bolt is loosened.

An adjusting screw H, mounted in the frame A, engages the rear end of the arm G and enables a ready and nice adjustment to be made of the plate F on the standard. The lower wall of the channel *g* and the lower wall *f'* of the standard upon which the knife carrying plate rests, are parallel with each other and are inclined at the same angle to the base as that along which it is desired to advance the axis of the rotary knife in adjusting this knife toward and from the base and throat plate. When the cutting edge of the knife becomes worn away in use, it becomes necessary to adjust the knife toward the throat plate to obtain proper cutting efficiency. To do this the bolt *g*³ is loosened sufficiently to permit endwise movement of the arm G in the channel *g* and the adjusting screw H is then manipulated to move the carrying plate F downwardly and forwardly a sufficient distance to effect the necessary adjustment of the knife. After the adjustment is made, the bolt *g*³ is tightened to clamp the plate F securely to the frame in its adjusted position. In Fig. 2 is shown in a diagrammatic way the nature of this adjustment of the knife. The larger circle *x* represents the circumferential cutting edge of a knife of normal size when in position in the machine. The smaller circle *x'* represents the circumferential cutting edge of this knife after the same has been worn away in use and the knife has been adjusted to take up this wear. This adjustment of the knife is forwardly and downwardly along the line *y y* which brings the cutting edge of the knife into close proximity to the throat plate. The arc *y' y'* represents that portion of the cutting edge of the knife represented by the larger circle *x*, which engages the material to be cut, and it will be noticed that the smaller knife represented by the circle *x'* has a cutting arc which almost coincides with the arc *y' y'*. The cutting edge of the smaller knife when adjusted, thus travels through the material in substantially the same arc as that of the larger knife and its cutting efficiency is therefore not materially lessened by reason of its decreased diameter.

In adjusting the knife, it is important that the driving connection between the drive shaft of the motor and the knife be such as not to become disengaged or disturbed by any changes in the position of the knife caused by the adjustment thereof. Any suitable driving connections may be employed for this purpose. In the construction shown, the following means are employed: The motor D is mounted on the frame A with the axis of its drive shaft *d* substantially parallel with the line of di-

rection in which the knife is to be moved for adjustment. The shaft *d* is provided at its forward end with a spiral gear I which meshes with a second spiral gear I' journaled on the frame A with its axis parallel with that of the gear I. The knife E is mounted on one end of the hub *k* of a gear wheel K, being secured thereon by a nut *k'* which has screw-threaded engagement with the end of the hub. The gear K is journaled on the stub axle *f* of the knife carrying plate F and is connected by an intermediate gear L with the spiral gear I'. The gear L is journaled on a stub axle *l* projecting laterally from the side of the knife carrying plate and lies in the same plane with the gear K at one side of the knife. The gears K and L being both journaled on the knife carrying plate, move with this plate in its various adjustments, and this movement causes the gear L to turn on the spiral gear I'. The circumferential face of the gear I' is comparatively wide and is parallel with the direction of movement of the knife carrying plate and the teeth of the gear L will thus travel across the face of the gear I' in the adjusting movement of the knife carrying plate without being thrown out of mesh therewith. The driving gears will thus remain in operative engagement with the knife in the different positions to which it can be adjusted. No change or adjustment of these gears is necessary, the machine being ready for operation as soon as the adjustment of the knife is completed.

The knife being mounted on a carrying plate which is adjustable relative to and independent of the standard and motor of the machine, the necessary adjustments of the knife can be easily and quickly made without changing the position of the standard or its motor, and the adjustment of the knife in a direction at an angle to the base, enables the employment of a base of much less vertical thickness than is necessary in a machine in which the knife can only be adjusted in a vertical direction toward and from the base.

I claim as my invention:

1. In a cloth cutting machine, the combination of a base which is adapted to support the cloth during the cutting operation, and a rotary knife which is supported above said base, said base having an opening to receive the lower edge of the knife, and said knife being adjustable on its support relative to said base in a forward direction toward the front end of said opening to bring the cutting edge of said knife into close proximity therewith as the diameter of the knife decreases from wear, substantially as set forth.

2. In a cloth cutting machine, the combination of a movable base which is adapted to pass beneath the material to be cut and

to support the same during the cutting operation and which is provided with a longitudinal slot and a rotary knife which is arranged above said base with its lower edge in said slot and is adjustably mounted on said base to move relative to said base in a forward direction at an inclination to said base whereby the cutting edge of the knife can be maintained in a substantially constant relation to the base as the diameter of the knife decreases from wear, substantially as set forth.

3. In a cloth cutting machine, the combination with a rotary knife and a horizontal base having an opening to receive the lower edge of the knife, of a standard secured to said base and supporting said knife, and means for adjusting said knife on said standard in a forward direction at an inclination to said base, substantially as set forth.

4. In a cloth cutting machine, the combination with a rotary knife and a horizontal base having an opening to receive the lower edge of the knife, of a standard secured to said base and supporting said knife and a driving motor for the knife mounted in substantially fixed position on the standard, said knife being adjustable forwardly relative to said motor and said base in a direction at an inclination to said base, substantially as set forth.

5. In a cloth cutting machine, the combination with a rotary knife and a horizontal base having an opening to receive the lower edge of the knife, of a standard secured to said base and supporting said knife, a driving motor for the knife mounted in substantially fixed position on the standard, said knife being adjustable forwardly relative to said motor and said base in a direction at an inclination to said base, and drive connections between the motor and the knife constructed to permit said adjustment of the knife, substantially as set forth.

6. In a cloth cutting machine, the combination with a rotary knife and a horizontal base having an opening to receive the lower edge of the knife, of a standard secured to said base, a driving motor for the knife mounted in substantially fixed position on the standard, a carrier for said knife adjustable on said standard to move said knife relative to said motor and said base and drive connections between said motor and said knife which remain in operative

engagement with said knife in its different adjusted positions, substantially as set forth.

7. In a cloth cutting machine, the combination with a rotary knife and a horizontal base having an opening to receive the lower edge of the knife, of a standard, a driving motor for the knife mounted in substantially fixed position on the standard, a knife carrier adjustable on said standard to move said knife relative to said motor and said base and drive gearing between said motor and said knife including a gear wheel which is mounted on said knife carrier and is adjustable therewith while in operative engagement with a cooperating driving gear on said standard, substantially as set forth.

8. In a cloth cutting machine, the combination of a base, a standard mounted thereon, a motor which is in substantially fixed position on said standard, a rotary knife which is adjustable relative to said motor and drive connections between said motor and said knife constructed to remain in operative engagement with said knife in its different adjusted positions, substantially as set forth.

9. In a cloth cutting machine, the combination of a base, a standard mounted thereon, a motor which is in substantially fixed position on said standard, a rotary knife which is adjustable relative to said motor and drive gearing between said motor and said knife including a gear wheel which is adjustable with the knife while in operative engagement with a cooperating driving gear on said standard, substantially as set forth.

10. In a cloth cutting machine, the combination of a base, a standard mounted thereon, a motor which is in substantially fixed position on said standard, a rotary knife, a carrier for said knife which is adjustable on said standard to move said knife relative to said motor, and drive gearing between said motor and said knife including a gear wheel which is mounted on said carrier and adjustable therewith and a cooperating driving gear mounted on said standard with which said gear wheel meshes in the different adjusted positions of said knife carrier, substantially as set forth.

Witness my hand this 29th day of August, 1911.

FREDERICK J. CLARK.

Witnesses:

E. C. HARD,

A. L. MCGEE.