

A. ROOS.
FABRIC CUTTING MACHINE.
APPLICATION FILED SEPT. 16, 1909.

954,210.

Patented Apr. 5, 1910.
4 SHEETS—SHEET 1.

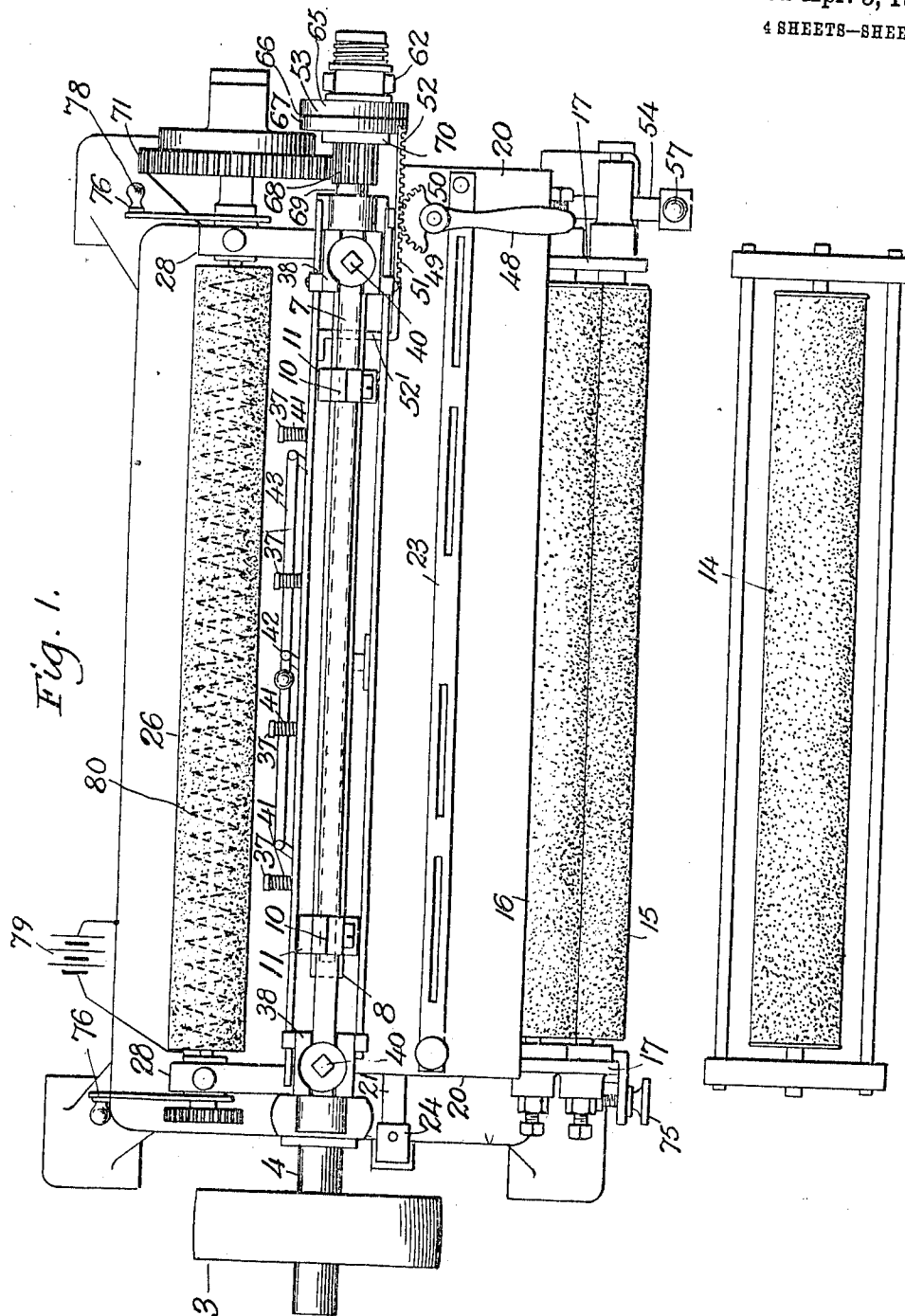


Fig. 1.

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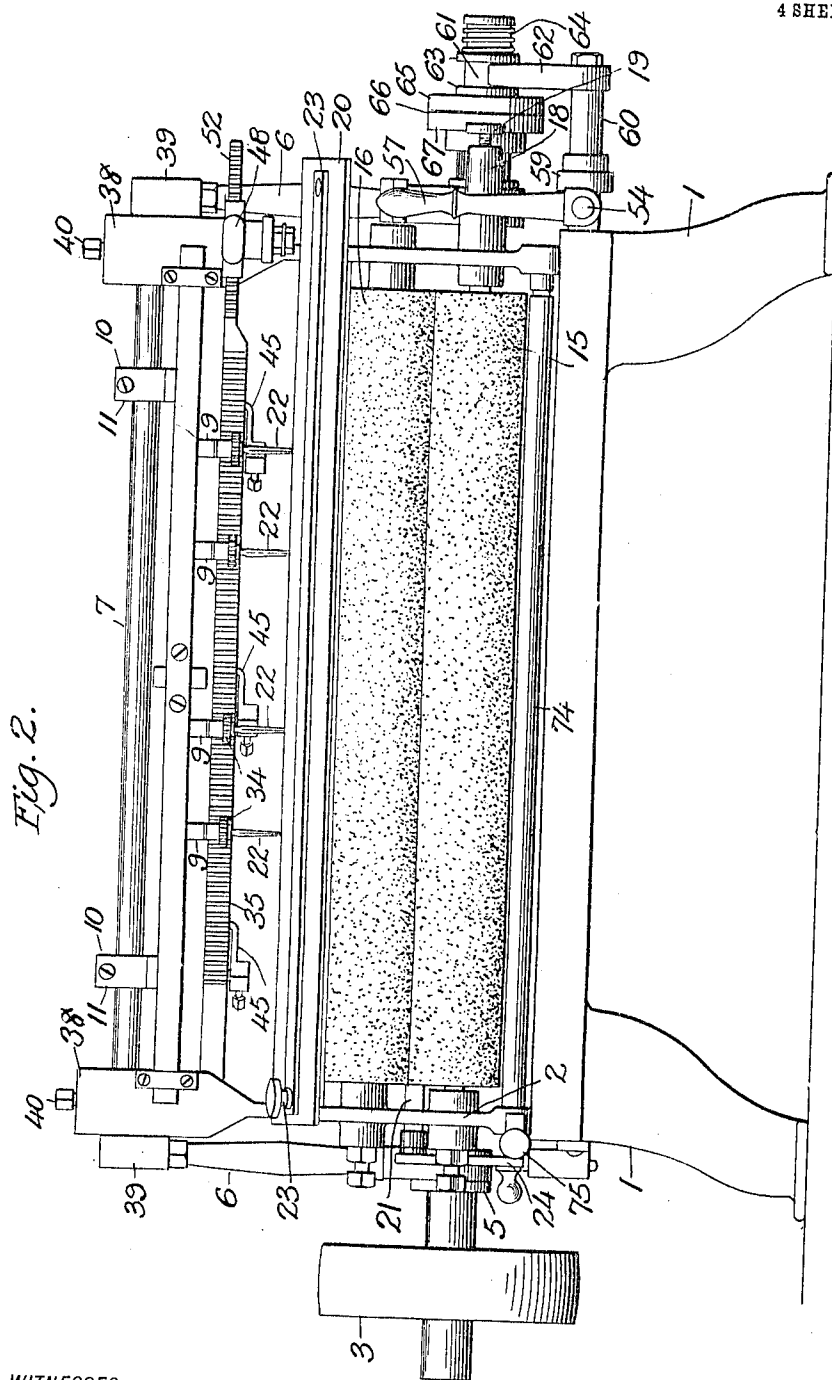


Fig. 2.

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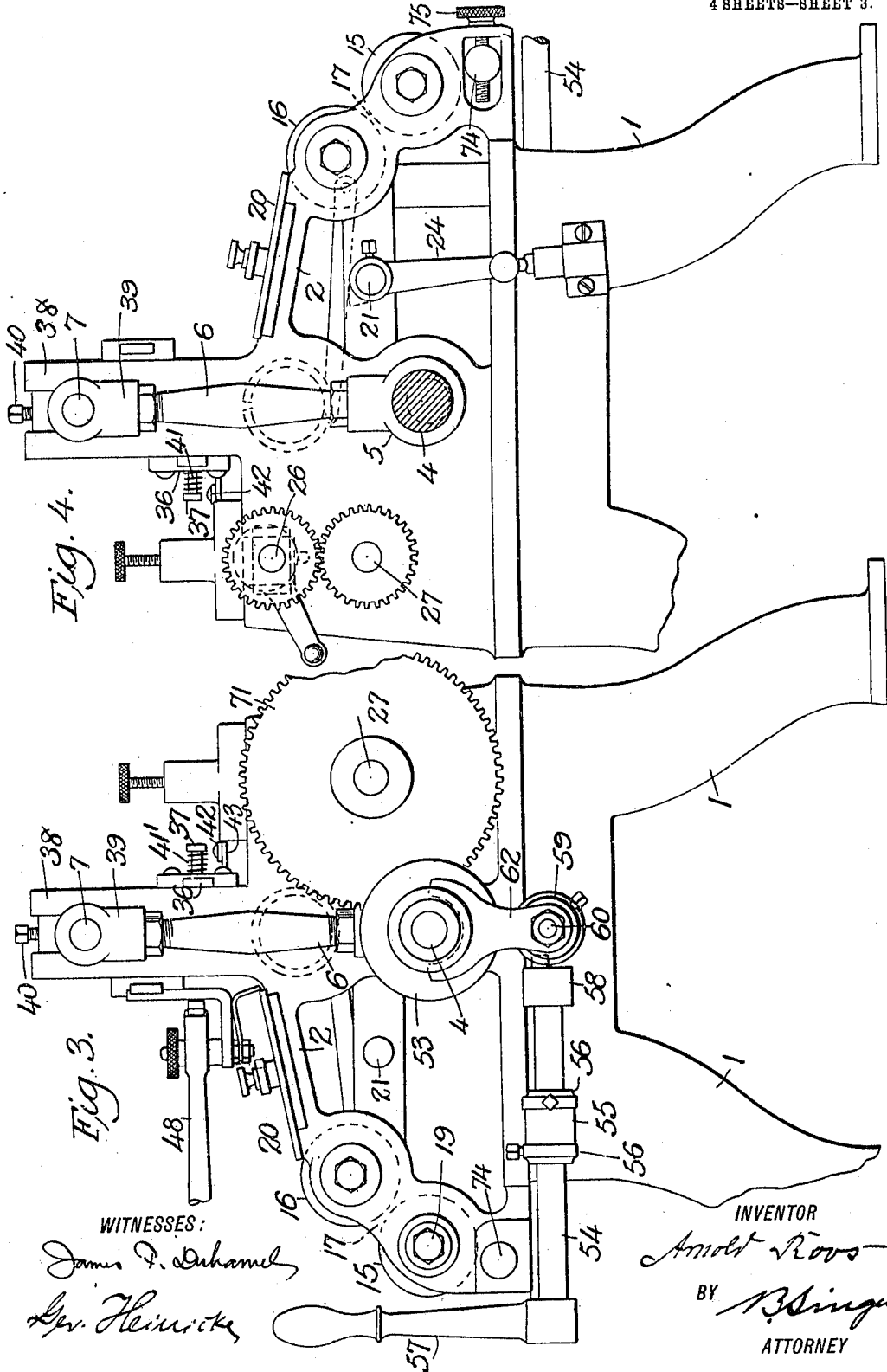
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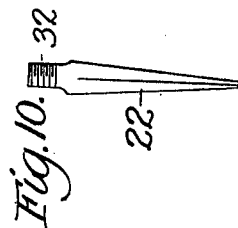
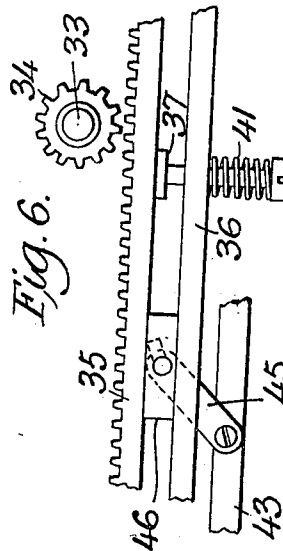
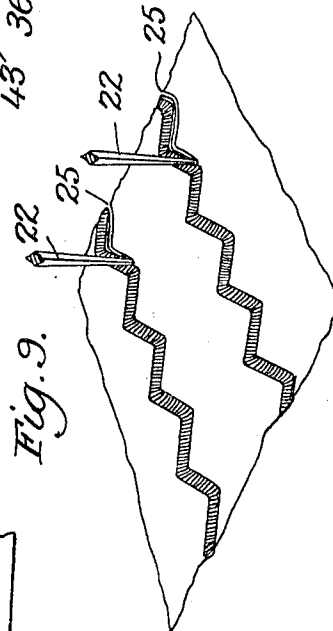
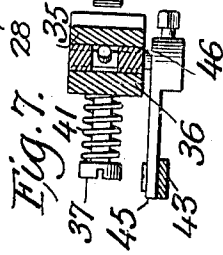
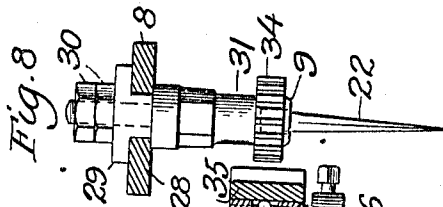
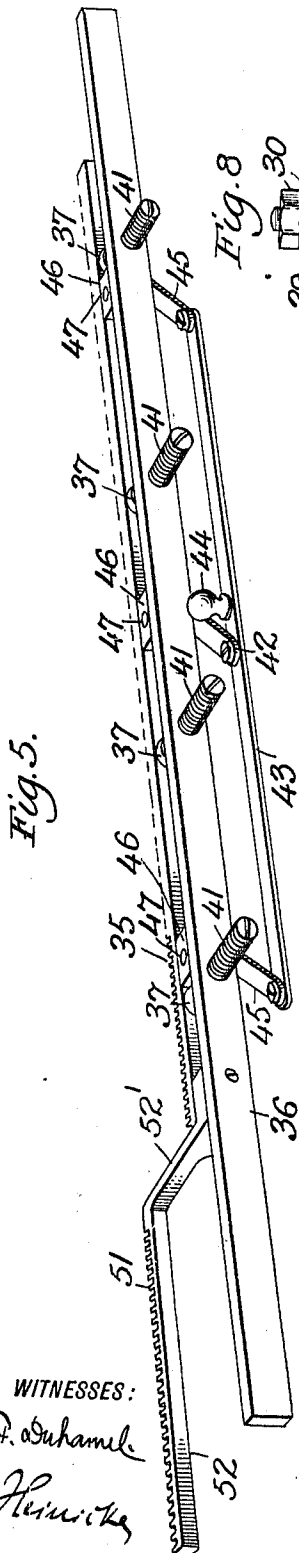
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954,210.

Patented Apr. 5, 1910.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ARNOLD ROOS, OF NEW YORK, N. Y., ASSIGNOR TO AKTIENGESSELLSCHAFT ARNOLD B. HEINE & CO., OF NEW YORK, N. Y., A FIRM.

FABRIC-CUTTING MACHINE.

954,210.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed September 16, 1909. Serial No. 518,006.

To all whom it may concern:

Be it known that I, ARNOLD ROOS, a citizen of the United States, residing at New York, New York county, State of New York, have invented certain new and useful Improvements in Fabric-Cutting Machines, of which the following is a clear, full, and exact specification.

This invention relates to fabric cutting machines especially designed for cutting out fabrics in irregular lines or in a piece adjacent to designs thereon, for instance fabrics upon which lace designs are formed by embroidery or otherwise.

An embroidery lace is commonly formed upon sheets of fabric of considerable width, each sheet containing a plurality of such designs and the designs so formed, are, as far as I am aware, now cut from the sheet by hand. By my Patent No. 879,675 of February 18, 1908, I have described a machine for a similar purpose, but in practice the same has shown so many disadvantages and inconveniences that it could not profitably be used. I therefore have been led to the construction of the machine forming the object of the present invention which does away with all the disadvantages accompanying the use of the older machine, and which, although being of simple and inexpensive construction, may be worked to great advantage by a skilled operator to cut out a plurality of designs simultaneously.

To these and other ends which will hereinafter be more fully explained, my invention comprises devices, novel features of improvement and combination and arrangement of parts or elements, which will be hereafter described and claimed, reference being had to the accompanying drawings forming part of this specification, wherein—

Figure 1 is a plan view of a fabric cutting machine embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is an end view of the machine from the right hand side. Fig. 4 is an end view of the same from the left hand side. Fig. 5 is a perspective view of the knife guiding mechanism. Fig. 6 is a detail plan view of the same. Fig. 7 is a central cross-section through the knife guiding and operating devices. Fig. 8 is an enlarged detail view of the cutting blade and its holder. Fig. 9 is a perspective view showing a piece of fabric having a design thereon and showing the

blades in Fig. 10 at an enlarged perspective view of a cutting blade in the act of severing the fabric.

Like characters of reference are intended to indicate corresponding parts in the several views.

Referring to the drawings, 1 designates a suitable base or support for the frame 2 of the fabric cutting machine.

Movement is imparted to the machine in the customary well known manner from any source of power by means of a belt traveling over a pulley 3, driving a shaft 4, revolving in suitable bearings mounted upon the base of frame 2. The shaft 4 carries at each of its ends between conveniently arranged sleeves and collars friction disks 5 and vertical plunger bars 6, integrally with said disks and connected at their upper ends by a connecting rod 7 from which a longitudinally slotted guide bar 8 for the knife holders 9, 9, is suspended between suitable brackets 10, the jaws 11 of which, are clamped around said rod 7. During the revolution of the shaft 4 a vertical reciprocating movement is thus imparted to the knife holders, whereby the blades are caused to rapidly pass through the fabric.

The fabric is led from a reel or other suitable receptacle (not shown) over a conveniently arranged guide roller 14 in front of the machine and is fed between two rollers 15 and 16 revolving in suitable brackets 17, 17, forming an integral part of the frame 2 upon the base 1. The lower of said rollers, 15, being removable, is kept in place by a suitable thorn or point of a horizontal pivot-pin standing under the action of a spring arranged in a horizontal cylindrical casing 18, so that by means of a thumb screw 19 or other suitable device the pressure of this spring against the pin may be released and the roller then withdrawn from its holder.

To the upper horizontally inclined portion of the brackets 17 is screwed or otherwise secured, a table 20, across which the fabric is guided underneath the cutting blades 22. Longitudinally across the table in its middle, a slotted bar 23 is extending, screwed with its ends to the table and serving to hold suitable guide rollers for the edges of the fabric in case the same is of considerable width, so as to avoid doubling up of the fabric at the edges. Said rollers being carried by suitable lever arms, the free

ends of which are fastened to the bar 23 by set screws extending through the slot of said bar, where they are secured by nuts or the like; the rollers engaging the fabric above the grooved roller 21. The roller 21 is arranged in a suitable frame adapted to be raised and lowered by means of a hand lever 24 which can be normally locked in vertical position for the purpose of keeping the roller elevated so that the cutting blades may work into its groove during their up and down stroke after having passed through the fabric. The roller is lowered by releasing the hand lever 24 for the purpose of exchanging the cutting blades, if such is necessary. After having passed the blades 22 and the roller 21, the designs will have been cut from the cloth, as shown at 25, and will be drawn between pressing rollers 26, 27, revolving in suitable bearings between conveniently arranged standards 28, 28, integral with the brackets 17 upon the frame 2 of the machine at the rear side of the same; one of said rollers, 26 for instance, may be heated by electricity or otherwise to increase the pressing effect. In the preferred form of my invention, an electrically operated heating device is shown in Fig. 1, one pole of a source of electricity 79 is connected to the frame of the machine, meanwhile its other pole is connected to a wire 80 embedded in current resisting material within said roller. The blades 22 are of the bayonet variety, that is, tapered and meeting in a sharp point, the edges being also ground to a knife edge. If the blades become dull, or are broken or bent, they can be readily removed from their holders by loosening the set screw 32 later on referred to. The cutout fabrics after having been pressed between the rollers 26, 27, may be rolled up by any desired well known means (not shown). As the blades are reciprocated and the fabric travels, the said blades will sever the fabric along the contour of the design thereon. Owing to the angular formation of said blades, they will, as they reciprocate, cut the fabric independently of the movement thereof, the feed of the fabric being simply to advance the design thereon toward the blades. The feed of the fabric and the reciprocation of the blades will be properly proportioned to fulfil the requirements.

As above stated, the knife holders 9 are suspended from a slotted guide-way or bar 8 and may be arranged in any convenient number, they consist of a socket member, the upper end of which is screw-threaded and extends vertically through the slot of the guide-way, where it is held in position by means of suitable washers or disks 29, sliding with their under side upon the upper face of said guide-way and nuts 30 upon the upper ends turning together with the sockets prevent withdrawal of the socket ends

through said washers and the slot of the guide-way. The lower part of said sockets 28 carries a sleeve 31 revolving with the socket through which horizontal screws 32 extend for the purpose of holding the blades 22 in position in the socket. Integral with the lower end of said sleeve is a disk 33 having a toothed periphery 34 revolving with said sleeve, the teeth of said disk engaging the teeth of a toothed rack or bar 35 connected to a slide bar 36 sliding horizontally in suitable holders 37 screwed to the rear side of forked standards 38 integrally with the brackets 17 and the frame 2 of the machine, between the forks of which, cylinders are vertically sliding through which the ends of rod 7 laterally extend to receive the upper end of the plungers 6 screwed into suitable sleeves 39. Vertical set-screws 40 in the top of the cylinders serve to firmly connect the rod and cylinders. The toothed rack 35 is connected to the slide bar 36 by means of bolts 37, firmly embedded in the rear of said rack, the free ends of which normally extend through holes in the slide bar 36, at the rear of which they are surrounded by spiral springs 41, one end of which is resting against the rear side of the rack, meanwhile the other end is connected to a head portion of the bolts, said springs are tending to normally hold the rack out of engagement with the teeth of the disks of the knife holders. A tension device 42 of suitable construction serves to tension the springs so that in their working position the teeth of the rack are firmly held in engagement with the teeth of the disks 33 imparting to the same a rotation in the opposite direction when the bar is sliding to the right or left. Said tensioning device 42 consists of a longitudinal rod 43 having a handle 44 upon its upper side and being suitably connected by links 45 to the underside of blocks 46 fastened to the front side of the bar 36 between the same and the rear side of the rack 35, said links revolving with their rectangular upward bent ends in bores 47 through the middle of said blocks 46.

The operation of the slide bar 35 is effected through the medium of a pivotally arranged hand lever 48 in front of the machine, slightly above the right hand end of the table 20, having a toothed segment 49 at its free end, the teeth 50 of which engage the teeth 51 of a small rack 52, which with its Z-shaped left hand portion 52 is resting against the right hand end of the rack 35 in the rear of which it is fastened to the slide bar 36 by screws entering the small shank of the Z. Thus, when the hand lever is turned to the right, the rack will be imparted a movement to the left and the knife holders with the knives revolve in the direction of the movement of the hand lever and vice-versa, so that they can be guided along

the outlines of the designs upon the cloth to be cut out.

To regulate the speed of the cutting blades and the proportional speed of the feed for the fabric, a suitable braking device 53 is arranged at the right hand side of the machine. This device consists of a horizontally brake rod 54 turning in a perforated block 55 arranged at the side of the base 1 of the machine, between two guiding collars 56 upon said rod. One end of said rod carries a hand lever or handle, 57, meanwhile its other end extending through a perforated block 58 also arranged at the side of the base 1 presses with its flattened part of its periphery against a collar 59 of a horizontally movable rod 60 laterally extending from the base 1, so that in turning the handle 57 to the right, the rod 60 is following this movement. Said movement of the rod 60 is transferred to a sliding sleeve 61 upon the shaft 4 by means of a link 62 screwed with its lower end to the end of rod 60 and gripping with its forked upper end around the sleeve 61 between the two collars 63, 63 forming an integral part therewith. Between the outer side of the right hand collar and a head portion 63 at the end of the shaft 4 a strong flat spring 64 is inserted tending to press the collared sleeves to the left. The left hand collar 63 of the sleeve is made in one piece with one member 65 of a friction clutch 66, the other member 67 of which is formed in one piece with a cog-wheel 68 between two collars 69, 70 to which it is firmly connected. The left hand collar 70, standing in frictional contact with the disk, 5. Said cog-wheel 68 during its rotation is engaging the teeth of a gear-wheel 71 rotating with a movable sleeve upon the shaft for the lower pressing roller, 27. Thus the speed of rotation of the shaft 4 and of the shaft for the pressing rollers coupled therewith, in a predetermined proportion can be increased or decreased at will by throwing the hand lever 57 to the right or to the left. In throwing said handle to the left, the members of the clutch 66 will come into more or less frictional contact and produce a more or less pronounced braking effect upon the shaft 4 and the parts coupled thereto.

Underneath the lower front guiding roller 15 for the fabric, a parallel steel rod 74 is provided, the left hand end of which is standing under the action of a thumb screw 75 by means of which said bar may be neared or withdrawn from the lower roller 15, so that by the exertion of a stronger or lighter pressure upon the fabric, the speed of feeding the same between the front guiding rollers may be varied at will.

The upper pressing roller 26, at the rear of the machine may be removed by means of suitable latches 76 eccentrically pivoted

to squared heads of said rollers projecting over the sides of the standards 28, the lower semi-circular periphery of said rollers is frictionally contacting with pins 77 in the machine frame, so that by turning the latches by means of knobs 78 at the outside of the same in vertical position the roller will be lifted out of its bearings in the standards and can then easily be removed.

It will of course be understood that the details and construction of the various features of my invention hereinabove described may be varied in many particulars without departing from the spirit and scope of my invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a fabric cutting machine, the combination of a plurality of adjustable pivotally mounted reciprocating cutting blades, working into the groove of a movable roller underneath the fabric, a slotted guide bar for said blades, and means adapted to cause said blades to cut said cloth to a predetermined design, pressing rolls, and means for heating one of said rolls.

2. In a fabric cutting machine, the combination of the fabric feeding device and a cutting device, said cutting device comprising a carrier, a transversely movable slide mounted in said carrier, an adjustable pivotally mounted cutting blade carried by said slide, and means adapted to impart to said cutting blade an oscillatory movement.

3. In a fabric cutting machine, the combination of a fabric feeding device and a cutting device, said cutting device comprising a carrier, a transversely movable slide mounted in said carrier, adjustable pivotally mounted cutting blades carried by said slide, means adapted to impart to said cutting blades an oscillatory movement, and means for imparting to said carrier a vertical reciprocating movement.

4. In a fabric cutting machine, the combination of a fabric feeding device, and a cutting device, said cutting device comprising a vertically reciprocating carrier, independently transversely adjustable cutting blades depending from said carrier, and a pivotally arranged hand operated lever, having a toothed segment engaging means for imparting to said blades a reciprocating transverse movement.

5. In a fabric cutting machine, the combination of a fabric feeding device, and a cutting device, said cutting device comprising a vertically reciprocating carrier, a transversely movable slide mounted in said carrier a plurality of independently transversely adjustable cutting blades mounted in said slide and a pivotally arranged hand operated lever having a toothed segment

engaging the teeth of a rack and imparting to said slide a reciprocating movement.

6. In a fabric cutting machine, the combination of a fabric feeding device and a cutting device, said cutting device comprising a carrier, a movable slide mounted in said carrier, a pivotally mounted cutting blade carried by said slide, a pivotally arranged hand operated lever, having a toothed segment engaging the teeth of a rack, adapted to impart to said cutting blades an oscillatory movement, and friction disks and plunger bars for imparting to said carrier a vertical reciprocating movement.

7. In a fabric cutting machine, the combination of guiding rollers adapted to grip and feed a sheet of fabric, said fabric having a design thereon, movable cutting blades adapted to sever said fabric, a pivotally arranged hand operated lever, a toothed segment upon the free end of said lever engaging the teeth of a rack, a second rack, and a slide bar, a tension device to hold the teeth of the second rack in engagement with the teeth of the disks of the blade holders, to cause said blades to follow the contour of said design, and means for regulating the movement of the cutting blades and the pressing rollers.

8. In a fabric cutting machine, the combination of means adapted to grip and feed a sheet of fabric having a design thereon, an adjustable grooved roller to receive the cutting blades after having severed said fabric, a pivotally arranged, hand operated lever having a toothed segment at one of its ends, engaging the teeth of a rack, a second rack and a tension device to hold the teeth of the second rack in engagement with the teeth of the disks of the blade holders, adapted to cause said blades to follow the contour of said design pressing rolls adjacent to said cutting blades, and means for imparting to the pressing rolls a speed proportionate to the speed of the cutting blades.

9. In a fabric cutting machine a frame, front feeding rollers carried in said frame, the lower of which is removable, a spring tending to press said lower roller in position, a thumb screw to release the pressure of said spring upon the roller, and a guide rod underneath and parallel to said lower front roller, an adjusting screw to advance against or withdraw said rod from said roller, for the purpose of increasing or decreasing the speed of the fabric, in combination with movable cutting blades, a rotatable shaft provided with means adapted to impart to said cutting blades a vertical reciprocating movement, means to cause said cutting blades to follow the contour of said design, means for rotating said shaft, means for transferring said rotation upon the shaft of the pressing rollers and means for regulating the speed of rotation of both of said shafts.

10. In a fabric cutting machine, a frame carrying rollers adapted to grip and feed a sheet of fabric having a design thereon, movable cutting blades for severing the fabric, an adjustable grooved roller underneath said cutting blades, pressing rollers adjacent to the cutting blades, a rotatable shaft provided with means adapted to impart to said cutting blades a vertical reciprocating movement, a friction clutch mounted on said shaft and adapted to regulate the speed of rotation of said shaft, a hand lever and a spring to actuate said friction clutch.

11. In a fabric cutting machine, a frame carrying rollers adapted to grip and feed a sheet of fabric, a pivotally arranged auxiliary roller in front of said first mentioned rollers, to regulate the feeding of the fabric, said fabric having a design thereon, movable cutting blades for severing the fabric, a rotatable shaft provided with means adapted to impart to said cutting blades a vertical reciprocating movement, a rotatable clutch loosely mounted on said shaft to regulate the speed of rotation of said shaft.

12. In a fabric cutting machine, the combination of means for feeding the fabric, reciprocating cutting elements, means for guiding the cutting elements, means for imparting to the cutting elements a reciprocating movement, and means for imparting to said cutting elements a horizontally sliding and oscillatory movement of varying degrees.

13. In a fabric cutting machine, the combination of means for feeding the fabric, cutting elements adapted to sever said fabric, a shaft adapted to impart movement to said cutting elements, a rotatable clutch, loosely mounted upon said shaft for varying the speed of the cutting elements and the friction rollers guiding the fabric and means for coupling said shaft to the shaft carrying the pressing rollers rotating at a different speed.

14. In combination with a fabric cutting machine, a plurality of independently transversely adjustable cutting blades, holders for said blades and means for imparting to said holders and their cutting elements a combined reciprocating and oscillatory movement.

15. In a fabric cutting machine, the combination of a plurality of adjustable cutting blades, holders for said blades adapted for an oscillatory movement of varying degrees and a pivotally arranged hand operated lever carrying a toothed segment at its free end, engaging means adapted to cause said blades to follow the contour of a design.

16. In a fabric cutting machine, the combination of traveling rollers adapted to grip and feed a sheet of fabric having designs thereon, cutting blades, means adapted to

guide said blades transversely of said fabric and adapted to simultaneously give to said blades a horizontal sliding and oscillatory movement.

- 5 17. In a fabric cutting machine, the combination of a pivotally arranged auxiliary roller in front of the machine, feeding rollers one of which is removable, cutting blades, holders for said cutting blades, an
10 adjustable grooved roller underneath said cutting blades, a shaft, friction disks and plunger bars upon said shaft imparting to said holders a vertical reciprocating movement, a guide for said cutting blades a piv-
15 otally arranged hand operated lever having a toothed segment engaging means for im-

parting to the blades a horizontal oscillatory movement adapted to guide them along the contour of the design upon the fabric, rear guiding and pressing rollers a speed regu- 20
lating friction clutch upon the main shaft and means for imparting a proportionate speed to the shaft carrying the rear rollers, substantially as described and for the pur-
poses set forth. 25

In testimony whereof I affix my signature in presence of two witnesses.

ARNOLD ROOS.

Witnesses:

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