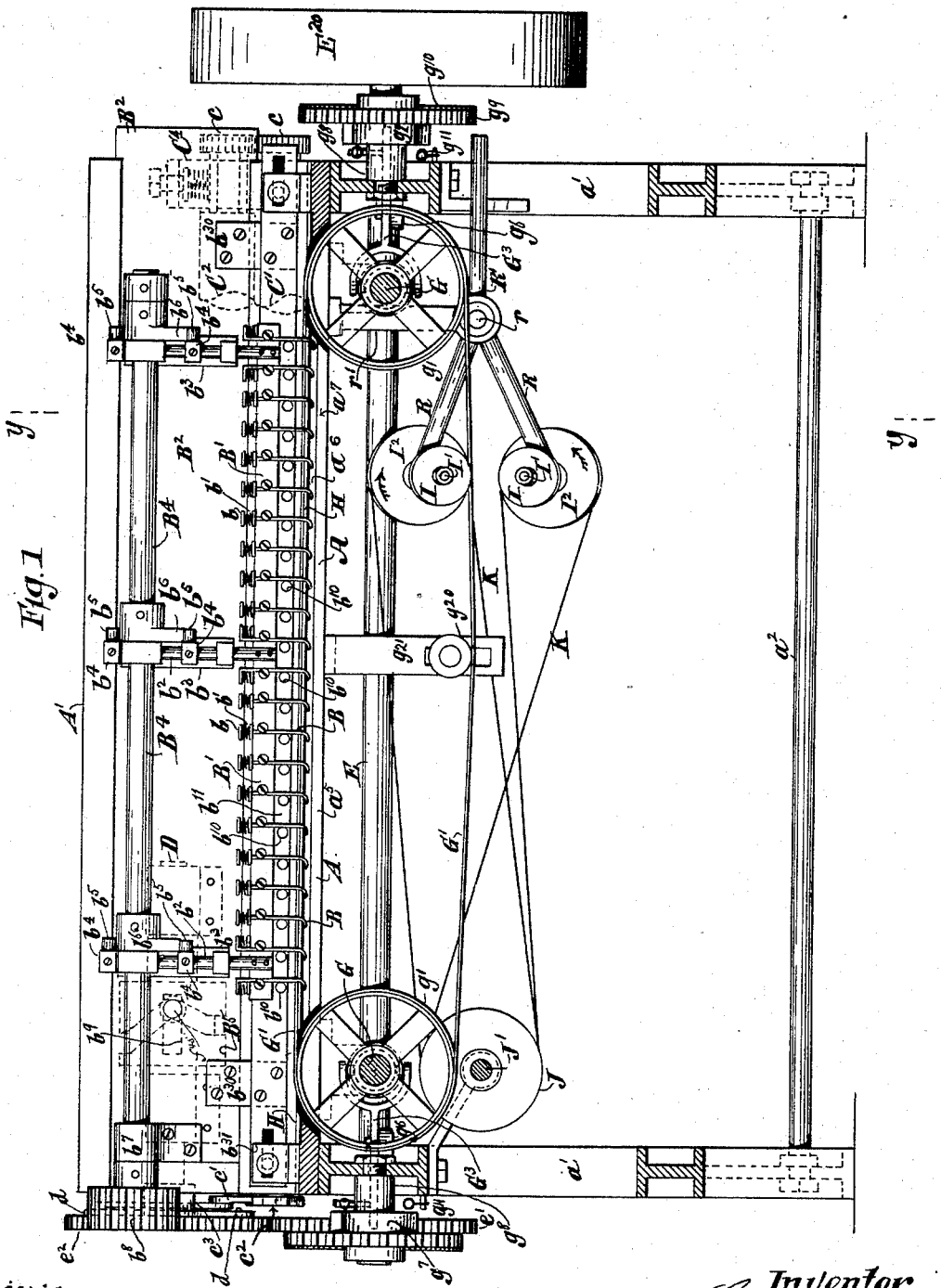
(No Model.) 3 Sheets—Sheet 1.

# L. SCHULTZ.

## MACHINE FOR CUTTING THREADS.

No. 456,739. Patented July 28, 1891.

Fig. 1



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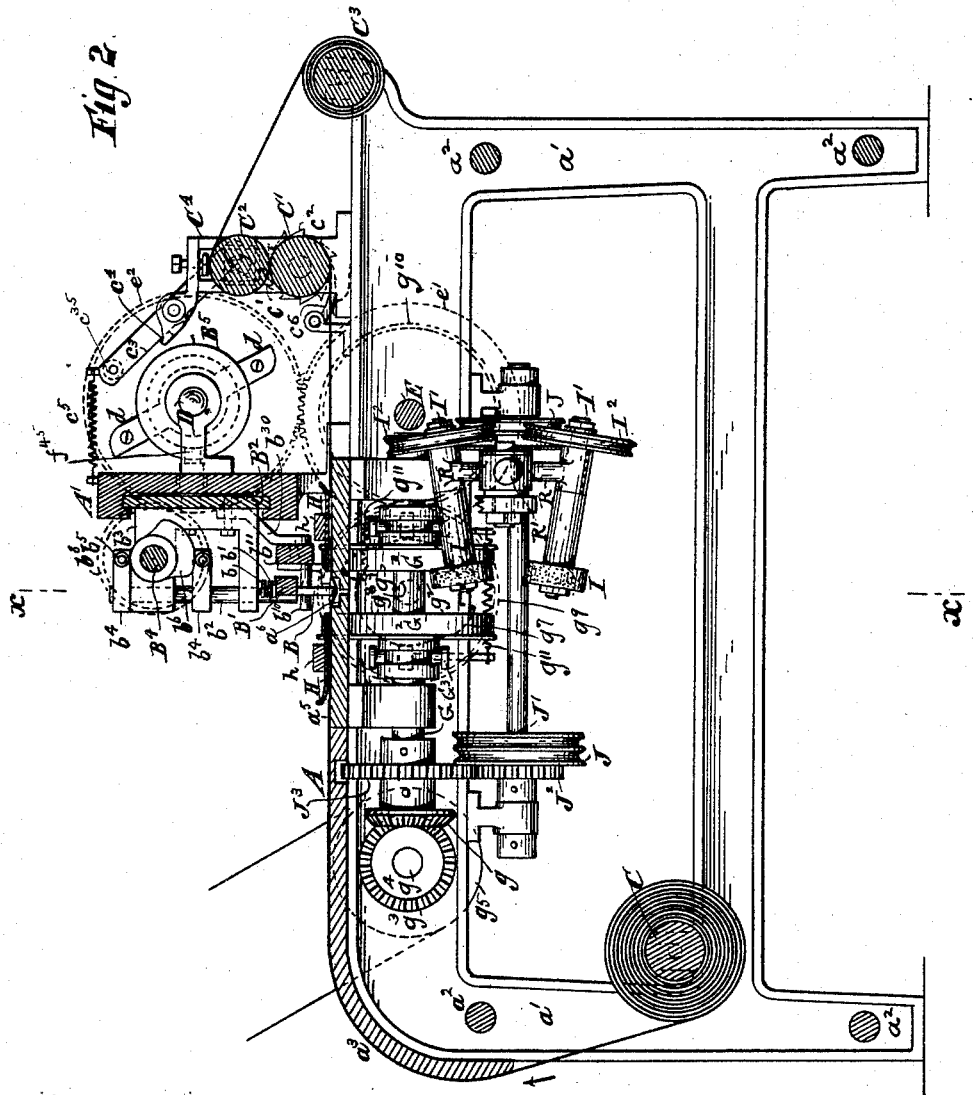
## MACHINE FOR CUTTING THREADS.

No. 456,739. Patented July 28, 1891.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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## MACHINE FOR CUTTING THREADS.

No. 456,739. Patented July 28, 1891.

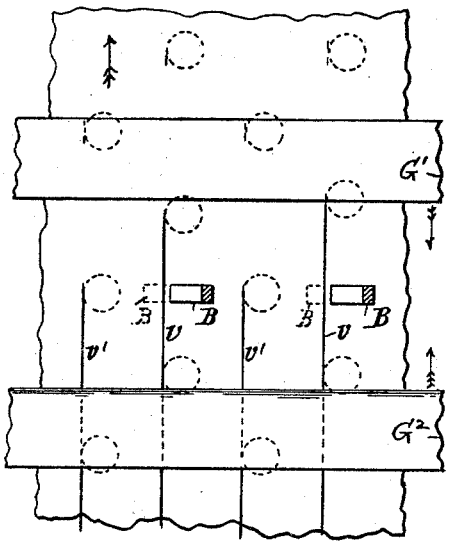


Fig. 3.

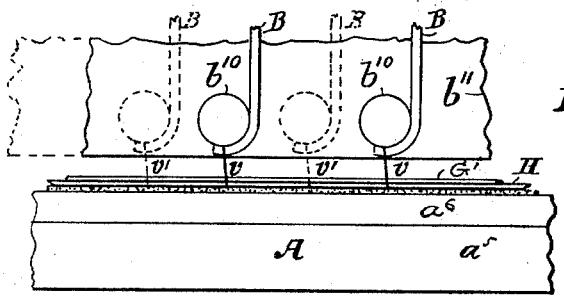


Fig. 4.

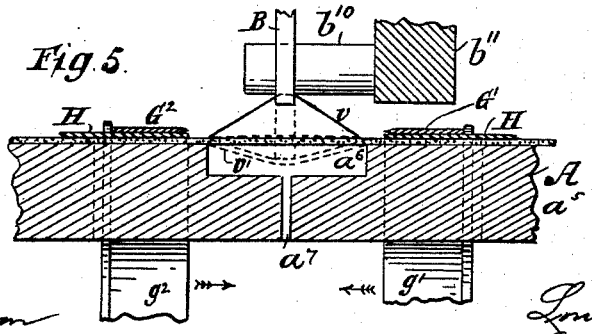


Fig. 5.

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# UNITED STATES PATENT OFFICE.

LOUIS SCHULTZ, OF NEW YORK, N. Y., ASSIGNOR TO THE EXCELSIOR QUILTING COMPANY, OF SAME PLACE.

## MACHINE FOR CUTTING THREADS.

SPECIFICATION forming part of Letters Patent No. 456,739, dated July 28, 1891.

Application filed July 3, 1890. Serial No. 357,625. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS SCHULTZ, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Machines for Cutting Threads Used in Quilting Fabrics, of which the following is a specification.

There is in common use a certain style of quilting-machine which produces rows of fanciful figures by a movement of the carriage containing feed-rollers whereby the fabrics are held, and which periodically have the motion of the carriage suspended and motion given to the feed-rollers to feed the fabric suitably for presenting a new surface to be decorated with the figures by the renewed movement of the carriage. During the motion of the feed-rollers, while the motion of the carriage is suspended, the sewing mechanism remains inert, and consequently no threads are carried over the fabric between the rows of figures which are produced by the movement of the carriage.

It is the object of my present improvement to provide a machine which will cut away the loose threads that are formed in a quilting-machine of the type referred to by the suspension of the operation of the sewing mechanism and carriage and the feeding of the fabric through the agency of the feed-rollers.

I will describe a thread-cutting machine embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section taken at about the plane of the dotted line $x\ x$, Fig. 2. Fig. 2 is a transverse vertical section taken at the plane of the dotted line $y\ y$, Fig. 1, certain parts being omitted. Fig. 3 is a face view of a portion of quilted fabric of the kind which has threads to be cut in this machine. This view also includes certain parts of the machine. Fig. 4 is a diagram showing a transverse section of the quilted fabric and including hooks which form part of the machine in different positions in bold outline and in dotted outline. Fig. 5 is a diagram showing a transverse section of the quilted fabric and one of the aforesaid hooks raised. It also includes certain other parts of the machine.

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

A designates a bed or table consisting, essentially, of two side frames $a'$, connected by stretchers $a^2$, and having extended between their front portions a platform $a^3$, made, preferably, of boards. The quilted fabric is passed over this table and under a number of hooks B. It may be placed upon a reel or roller C and drawn over the table by means of feed-rollers C′ C² and taken up by a reel or roller C³. The reels or rollers C C³ are shown as supported in open top bearings provided in the side frames of the table, so as to be removable. The take-up roller C³ may be rotated to take up the fabric by any suitable mechanism. The feed-rollers are shown as arranged in standards C⁴, erected on the side frames of the table. They are geared together at one end by gear-wheels $c$ and derive motion from a pawl $c'$, engaging with a ratchet-wheel $c^2$, which is affixed to the roller C′. The pawl $c'$ is pivotally connected with one end of a lever $c^3$, which is fulcrumed between its ends in one of the standards C⁴, and at the upper end is connected to a spring $c^5$, which is fastened to a cross-bar A′, which is supported from the side frames of the table and extends over the top of the table. A shaft D, supported by brackets fastened to the cross-bar A′, has affixed to it the arms $d$, which as the shaft rotates contact with the upper end of the lever $c^3$ upon a friction-wheel $c^{35}$, secured thereto, and oscillate the lever in such manner that the pawl $c'$ will be caused to impart a rotary motion to the ratchet-wheel $c^2$, and consequently to the two feed-rollers. The motion of the feed-rollers is of course intermittent. The standard C⁴, in which the lever $c^3$ is fulcrumed, is extended to form a stop $c^4$, whereby the movement of the lever under the influence of the spring $c^5$ will be limited. A stop-pawl $c^6$, coacting with the ratchet-wheel $c^2$, prevents the movement of the feed-rollers in the wrong direction. The shaft D is rotated from the driving-shaft E of the machine through gear-wheels $e'$ $e^2$, which are affixed to the two shafts. The driving-shaft is journaled in the side frames of the table and has a driving-pulley E²⁰

affixed to one end. Beneath the hooks there is a section $a^5$ of the table-top, which will be preferably made of metal, because it has in it a recess $a^6$, extending right across the range of hooks B. At the bottom of this recess there is a slot $a^7$, which extends from the recess right through the under side of the table-top. It is used in connection with slits extending lengthwise of the machine to facilitate the introduction of band-saws, which will be presently described.

The hooks B are connected to a bar B'. Their hooked portions are at the lower extremities. At the top are heads $b$, between which and the bar B' springs $b'$ are coiled. Preferably washers will be arranged between the springs and the bar. These springs are simply to afford a slight yielding movement to the hooks in the direction of their shanks or bodies. The bar B' is connected with rods $b^2$, which are intended to work vertically in brackets $b^3$, which are secured to a plate $B^2$, that is fitted to slide lengthwise in the cross-bar A' of the machine, and consequently transversely to the length of the machine. On the rods $b^2$ are secured collars $b^4$, which are provided with anti-friction rollers $b^5$ to coact with cams $b^6$, which are mounted on a rotary shaft $B^4$. This shaft $B^4$ is journaled n the brackets $b^3$ and is carried by them. It also has a bearing in a bracket $b^7$, which is fastened to the sliding plate $B^2$. A pinion $b^8$ is secured to this shaft $B^4$, and is made wide enough so that it may maintain engagement with the gear-wheel $e^2$ of the shaft D, notwithstanding its movement with the shaft $B^4$ widthwise of the machine. The cams $b^6$ are so set that during the intermissions between the movements of the feed-rollers they will first lower the hooks, and thereby cause a depression of the quilted fabric into the recess $a^6$, formed in the section $a^5$ of the table-top. The weight of the hooks is sufficient to effect the depression of the quilted fabric when the bar B' is lowered. The friction between them and the bar also aids them in depressing the fabric.

The depression of the fabric by the hooks B occurs when a portion of the fabric traversed by the threads or portions of threads $v$, Fig. 3, is beneath the hooks, and the depression of the fabric brings the extremities of the hooks on a lower plane than the threads $v$. The cams $b^6$ are so shaped as to keep the hooks depressed for some little time. While they are depressed the sliding plate $B^2$ is moved in such direction as to cause the extremities of the hooks to slip under the threads $v$. This motion of the sliding plate $B^2$ is effected by means of a circumferentially-grooved cam $B^5$, affixed to the shaft D. By reference to Fig. 1 it will be seen that this groove deviates or is inclined in the direction of the length of the axis of the cam. A pin or roller $f^{45}$ engages the groove of the cam and is fastened to the sliding plate $B^2$. To reach the cam it passes through a longitudinal slot $B^9$ in the cross-bar A'. After the hooks have been engaged with the threads $v$ the cams $b^6$ will raise them. In the upward movement the extremities of the hooks will be brought under pins $b^{10}$, which are supported by the sliding plate $B^2$, they extending forward from a bar $b^{11}$, secured by brackets to the said sliding plate $B^2$. The threads $v$ will thus be brought up against the under side of the pin $b^{10}$. The springs $b'$ are used so that the hooks may be forcibly raised against the pins $b^{10}$ without liability of breaking any of the parts through inaccuracy in fitting them together. The threads $v$ will be clamped between the extremities of the the hooks B and the pins $b^{10}$. While the threads $v$ are thus held upward they are intended to be cut upon endless band-knives G' $G^2$. These endless band-knives are supported on pulleys $g'$ $g^2$, mounted to rotate with shafts G, but which engage with these shafts by splines or feathers, so as to be free to slide therewith. To cut the threads $v$, these endless band-knives are caused to approach each other by the sliding of the pulleys $g'$ $g^2$ on the shafts G. It will be readily understood that the shafts G extend lengthwise of the machine and the endless band-knives crosswise. Only one of the shafts G need be positively driven, as the pulleys of the other may be rotated by the knives themselves. The shaft G, which is positively driven, has a bevel gear-wheel $g$ affixed to one end and deriving motion from a bevel gear-wheel $g^3$, affixed to a shaft $g^4$, which is journaled in one of the side frames of the machine and provided with a belt-pully $g^5$, by which motion may be imparted to it. The adjustment of the pulleys $g'$ $g^2$ is effected by means of levers $G^3$, having forked ends provided with pins engaging circumferential grooves in the hubs of the pulleys. These levers $G^3$ are fulcrumed between their ends to brackets $g^6$, secured to the side frames of the machine, and are oscillated by cams $g^7$, mounted on studs $g^8$, which are driven through gear-wheels $g^9$ $g^{10}$ from the driving-shaft E. These cams $g^7$ will be so timed that after the elevation of the hooks B' and threads $v$ they will force the pulleys $g'$ $g^2$ of the two endless band-knives toward each other far enough to effect the cutting off of the threads $v$ close to the figures of the quilting between which they extend. After the performance of this work the cams $g^7$ will allow the pulleys to return to their normal positions, springs $g^{11}$ being employed to effect this movement. After the return of the band-knives to their normal positions, but before the depression of the hooks B, the feed-rollers operate to move the quilted fabric sufficiently to present the series of threads $v'$ beneath the hooks. To make this clear I will call attention to the fact that in the pattern of quilting represented in Fig. 3 each row of the ornamental figures is arranged opposite the spaces between the figures of the next adjacent row, so that alternate rows of the figures are in

line. The threads $v$ and $v'$ connect the rows which are in line. The object of the movement of the feed-rollers just referred to was to advance the fabric sufficiently to bring the threads $v'$ into position to be engaged by the hooks. This having been accomplished, the hooks B′ are lowered and the sliding plate $B^2$ is moved still farther away from its normal position to bring the extremities of the hooks beneath the threads $v'$. Afterward the hooks raise the thread $v'$ against the pin $b^{10}$ and the band-knives are moved toward each other to cut off the threads $v'$. The feed-rollers now are free to move the fabric and the sliding plate is returned to its normal or starting position. These movements are accomplished by the shape of the cams already referred to.

To prevent the knives G′ $G^2$ from contacting with the goods, I employ metal shields or plates H above the section $a^5$ of the table-top and elevated sufficiently to allow of the passage of the fabric between them and the said section of the table-top. These shields are stationary and may be secured to bars $h$, fastened to the side frames of the table.

With each band-knife I combine a pair of grinders or sharpeners I, which are made in the form of wheels, one above and one below a knife, and are mounted on shafts I′, whereby they are rotated. These shafts I′ have affixed to them pulleys $I^2$, which receive belts K, deriving motion from pulleys J, affixed to a shaft J′. The shafts carrying each pair of sharpeners I are supported by arms R, which are connected with a rod R′, that is fitted in a rocking bearing $r$, provided in a bracket $r'$, that is fastened to the under side of the table-top. The rod R′ may be oscillated, as here shown, by hand to bring each sharpener of a pair in contact with the corresponding endless-band knife to sharpen the same. The shaft J′ belonging to each pair of sharpeners has affixed to it a gear-wheel $J^2$, which derives motion from a gear-wheel $J^3$, which is affixed to one of the shafts G. In this way motion is imparted to the pulleys J, and thence to the sharpeners.

The band-knives may be tightened by adjusting pulleys or rollers $g^{20}$, against which they bear. These rollers are mounted upon studs, which are affixed in longitudinal slots provided in brackets $g^{21}$, fastened to the table A.

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

1. In a cutting-machine, the combination of one or more hooks, means substantially such as described for raising and lowering the same, means substantially such as described for moving them transversely, and an endless band-knife operating adjacent to said hook or hooks, substantially as specified.

2. In a cutting-machine, the combination of one or more hooks, means substantially such as described for raising and lowering the same, one or more stops against which the said hook or hooks may impinge when raised, means substantially such as described for moving the said hook or hooks transversely, and a knife operating adjacent to said hook or hooks, substantially as specified.

3. In a cutting-machine, the combination of a number of hooks, a bar to which said hooks are connected and which is supported to reciprocate in the direction of the length of the shanks of the hooks, stops with which said hooks may contact when raised, means substantially such as described for raising and lowering the bar, means substantially such as described for moving it transversely, and a knife operating adjacent to said hooks, substantially as specified.

4. In a cutting-machine, the combination of a number of hooks, a bar to which said hooks are connected and which is supported to move in the direction of its length and to reciprocate in the direction of the length of the shanks of the hooks, springs affording a yielding connection between said hooks and bar, stops with which said hooks may contact when raised, means substantially such as described for raising and lowering the bar, means substantially such as described for moving it transversely, and a knife operating adjacent to said hooks, substantially as specified.

5. In a cutting-machine, the combination of a number of hooks, a bar to which said hooks are connected and which is supported to reciprocate in the direction of the length of the shanks of the hooks and also to move in a direction transverse thereto, stops with which said hooks may contact when raised, means substantially such as described for raising and lowering the bar, means substantially such as described for moving it transversely, and a knife operating adjacent to said hooks, substantially as specified.

6. In a cutting-machine, the combination of a knife, a number of hooks, a bar to which said hooks are connected and which is supported to reciprocate in the direction of the length of the shanks of the hooks, a shaft from which said reciprocating motion is imparted to the bar, and a support for said shaft, movable in the direction of the axis thereof, whereby said hooks may be made to receive a motion transverse to the length of their shanks, as well as in the direction of the length of their shanks, substantially as specified.

7. In a cutting-machine, the combination of a table or fabric-support having a recess, a number of hooks opposite the recess supported and adapted to reciprocate into and out of said recess, a rotary shaft and cams for causing said reciprocation, a support for said hooks, movable in a direction transverse to the length of the shanks of the hooks, whereby said hooks, after being depressed into the recess, may be moved lengthwise of

the recess, stops with which the hooks may contact when reciprocated out of the recess, and a knife, substantially as specified.

8. In a cutting-machine, the combination of a table or fabric-support, a number of reciprocating hooks arranged adjacent thereto, a shield or plate arranged to be above the fabric, and an endless band-knife moving above said shield or plate, substantially as specified.

9. In a cutting-machine, the combination of a table or fabric-support, a number of reciprocating hooks arranged adjacent thereto, and a knife movable continuously in one direction at a distance from the fabric transversely to the length of the shanks of the hooks, so as to cut threads elevated by said hooks, substantially as specified.

10. In a cutting-machine, the combination of a table or fabric-support, a number of reciprocating hooks arranged adjacent thereto, and two endless band-knives movable toward each other and transversely to the length of the shanks of the hooks, substantially as specified.

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