

No. 812,409.

PATENTED FEB. 13, 1906.

J. DIEHL.  
SEWING AND CUTTING MACHINE.

APPLICATION FILED NOV. 21, 1899.

4 SHEETS—SHEET 1.

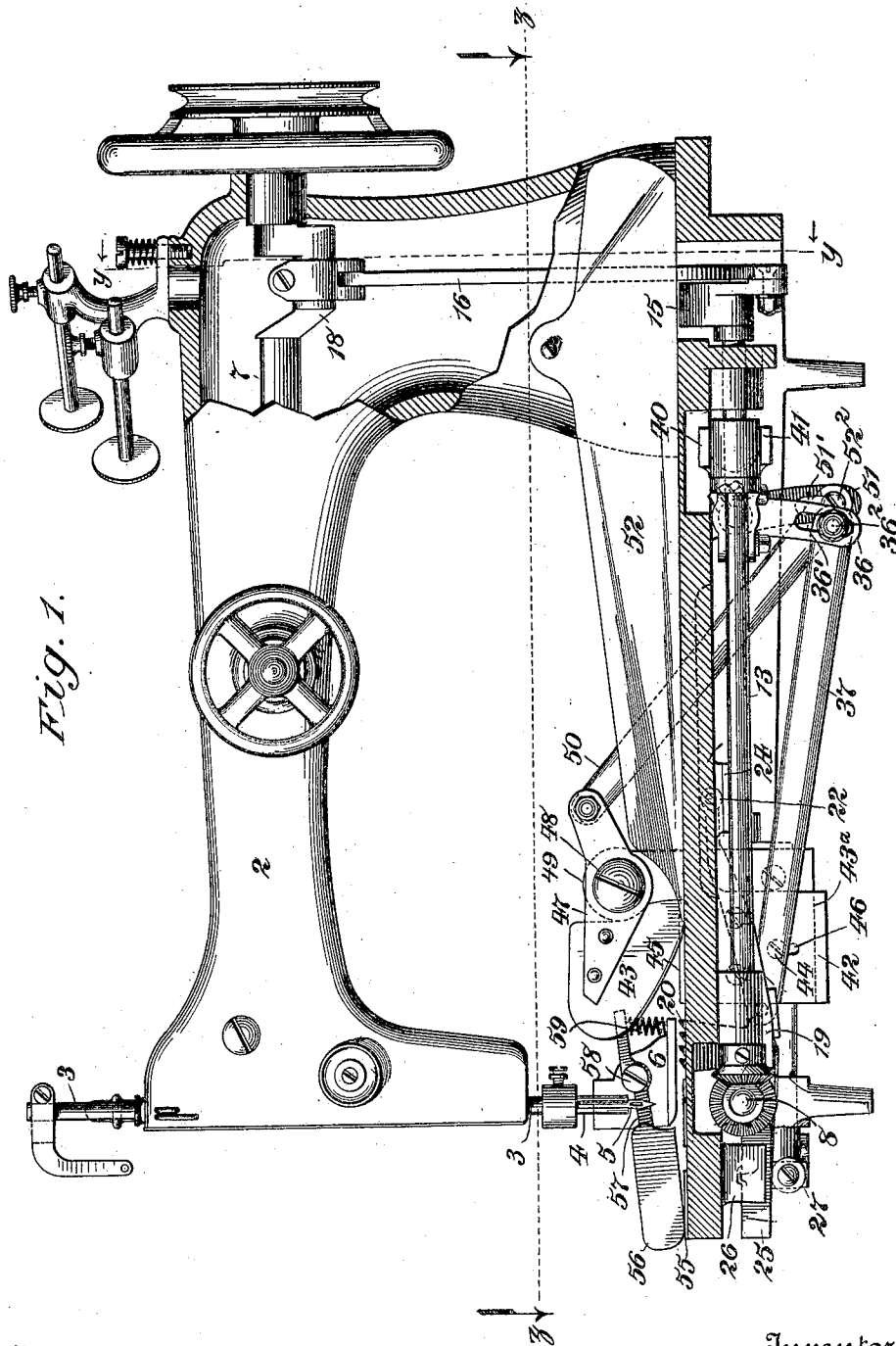


Fig. 1.

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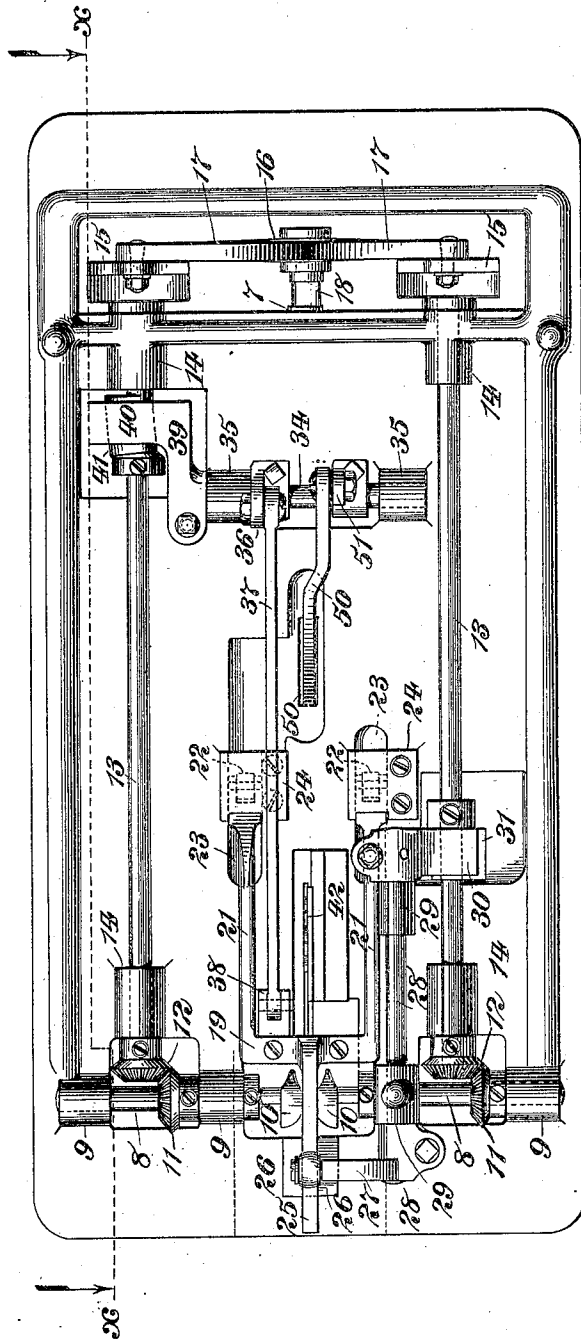
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

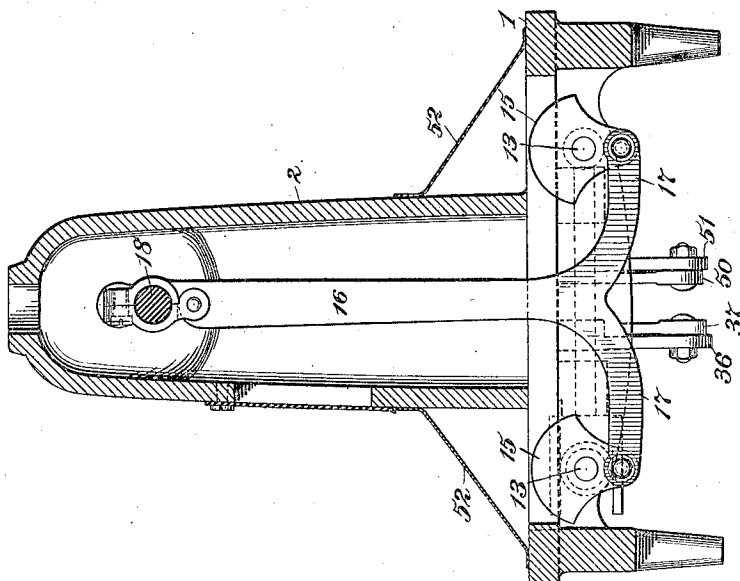
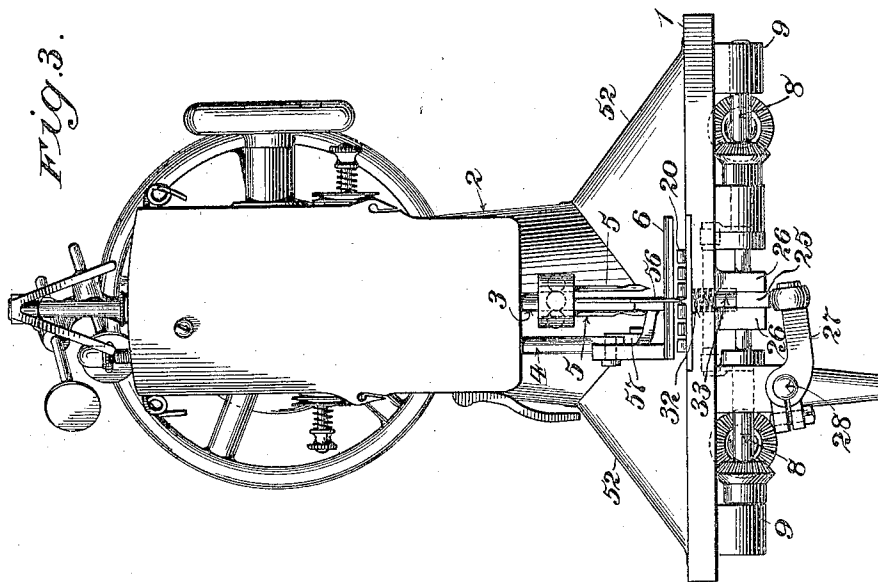


Fig. 3.



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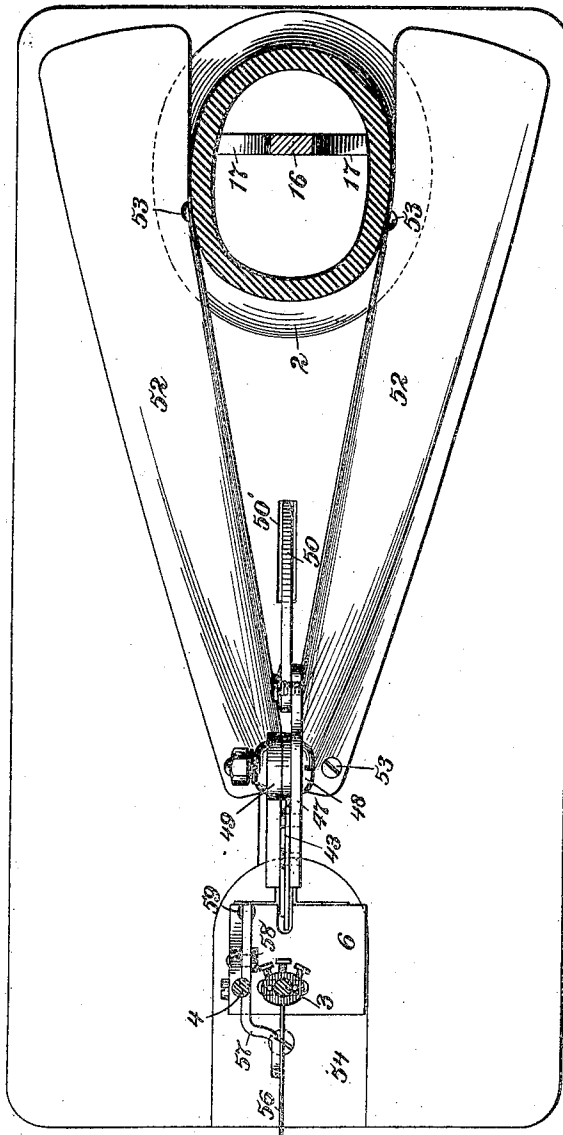
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4 SHEETS—SHEET 4.

Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## SEWING AND CUTTING MACHINE.

No. 812,409.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed November 21, 1899. Serial No. 737,728.

*To all whom it may concern:*

Be it known that I, JACOB DIEHL, a citizen of the United States, and a resident of Cleveland, Cuyahoga county, State of Ohio, have invented certain new and useful Improvements in Sewing and Cutting Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention has for its object to provide a simple and effective machine for sewing a double row of stitching through a piece of goods and cutting or splitting the latter between the rows of stitching during a continuous passage of the same over the cloth-plate of the machine, the rows of stitching adjacent to the cut or split edges of the goods being adapted to prevent fraying or raveling of the latter at such points.

My improved machine although adapted to operate upon any class of work to be stitched and cut is more especially intended for use in making rugs out of grass matting, which latter is usually woven in large pieces and then cut or split up into smaller pieces of different sizes for rugs, thus rendering it necessary on account of the loose weave of the matting to stitch the same prior to cutting in order to prevent undue raveling or fraying of the same at their cut edges.

The various features of my invention will be hereinafter set forth in detail, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my invention with the arm partly broken away and the bed-plate in section through line *z z* of Fig. 2. Fig. 2 is a bottom view of the machine. Fig. 3 is a front end elevation of the machine. Fig. 4 is a vertical section through line *y y* of Fig. 1, and Fig. 5 is a plan view of the machine below line *z z* of Fig. 1.

To explain in detail, 1 indicates the bed-plate of the machine; 2, the overhanging arm thereof; 3 and 4, the needle and presser bars, respectively, supported in suitable bearings in the front end of the arm 2 with the needle-bar 3 carrying two needles 5 5 and the presser bar 4 being provided with a presser-foot 6, and 7 the upper driving-shaft supported in suitable bearings in the arm 2 and having operative connection with the needle-bar 3 to communicate a vertically - reciprocating

movement thereto. The above parts are substantially of usual construction, arrangement, and operation.

On the under side of the bed-plate 1 and adjacent to the front end thereof two short looper-shafts 8 8 are supported in axial alignment with each other in suitable bearings formed in lugs 9 9, depending from the bed-plate, each of said shafts being provided at their adjacent ends with a looper-hook 10 for entering the thread-loop thrown out by the needles and forming a chain-stitch. These looper-shafts are each provided with a bevel-gear 11, secured thereon, which mesh with bevel-gears 12 12 on one end of two rotating shafts 13 13, which latter are also supported in bearings formed in lugs 14 14 on the under side of the bed-plate and at their rear ends are each provided with a crank-disk 15. A pitman 16, provided with two arms or extensions 17 17 at its lower end having a pivotal connection with said crank-disks 15 15 and at its upper end connecting with a crank 18 in the driving-shaft 7, serves to communicate a rotary movement from the latter to the shafts 13 13, and thereby to the looper-shafts 8 8.

The device for feeding the work to be operated upon, as herein shown, consists of a frame 19, which is supported beneath the bed-plate of the machine and provided with an upwardly-projecting extension 20, the upper surface of which is toothed or serrated and is adapted to project above the upper surface of the bed-plate through an elongated slot therein to engage with the under side of the work and feed the same in the usual manner. This feed device, which is adapted to move in a direction lengthwise of the machine, may be supported in any suitable manner to be capable of having the usual horizontal and vertical movements, the same, as herein shown, being provided at one end thereof with two arms 21 21, the ends of which are provided with antifriction-rolls 22 22 and extend within two grooves or guides 23 23, formed in the under side of the bed-plate, in which they are loosely retained, so as to be capable of having a reciprocating movement therein, by means of two plates 24 24, which partially span said grooves. Another arm or extension 25 of said feed device projects therefrom in a direction opposite

that of the arms 21 and extends between two lugs 26 26 on the under side of the bed-plate, between which it is loosely supported and guided to be capable of having a vertical and longitudinal movement, the said arm 25 being supported in vertical position between the lugs 26 upon an arm 27 of a rock-shaft 28, from which the feed device receives its vertical movement in a manner as will be described.

The rock-shaft 28 is supported in bearings in lugs 29 29 on the under side of the bed-plate and is provided with a rigidly-connected arm 30, having a forked end which embraces a cam 31 on the adjacent rotating shaft 13. The shaft 28 thus receives its rocking movement from the cam 31, and thereby causes the free end of its lever-arm 27 to move up and down and communicate a like movement to the feed device resting thereon, the movement of said lever-arm being such as to cause the feed device to rise above the bed-plate at the beginning of its forward longitudinal movement and drop at the end of such movement in the usual manner, as well understood by those skilled in the art. The arm 25 of the feed device is held in contact with the lifting lever-arm 27, so as to follow the latter in its downward movement, by means of a coiled spring 32, which is seated within an opening or pocket formed in the bed-plate, with one end bearing against a block 33, which rests upon the upper surface of the said feed-arm 25, as more clearly shown in Fig. 3.

The feed device receives its longitudinal movement from a rock-shaft 34, which is supported in bearings in lugs 35 35 in a transverse position across the under side of the bed-plate. This rock-shaft 34 is provided with a downwardly-projecting arm 36, which is connected with the feed device through the medium of a pivoted connecting-rod 37, the said feed device, as herein shown, being provided with a forked arm 38 for the connection therewith of the said rod 37. The rock-shaft 34 is provided with an arm 39, having a forked end 40, which embraces a cam 41 on the rotating shaft 13, from which cam the rock-shaft is actuated to give its arm 36 a vibrating movement, and thereby cause the connected feed device to move back and forth in the usual manner.

Immediately forward of the feed device and in position to act upon the work fed forward thereby is a cutting mechanism comprising a stationary cutter-plate 42, over which the work passes, and a vibrating cutter-blade 43, arranged to cooperate with said stationary cutter to cut or sever the interposed work. The stationary cutter-plate 42, as herein shown, is supported in position upon a lug 43<sup>a</sup> on the under side of the bed-plate by means of screws 44 and is rendered

adjustable, so that its upper cutting edge 45 may project a greater or less distance above the upper surface of the bed-plate by means of vertically-elongated slots 46 therein, through which the screws 44 pass, such slots permitting the cutting-plate to be adjusted vertically relative to the lug 43 after its fastening-screws 44 have been loosened, after which it may be secured in adjusted position by again tightening the screws 44.

The upper or movable cutting-blade 43 is secured upon one end of a lever 47, which latter is pivotally mounted between its ends upon a pin or screw 48, which is supported in a stationary stud or projection 49 on the upper surface of the bed-plate. The opposite end of the lever 47 is pivotally connected with one end of a rod 50, which latter extends through a slot 50' in the bed-plate 2, and is pivotally connected at its lower end with an arm 51 of the transversely-arranged rock-shaft 34. The vibrating movement given to this arm 51 by the rock-shaft 34 communicates a rocking movement to the lever 47, and thereby causes the cutter-blade 43 to move up and down in cooperation with the stationary cutter, the form of the movable cutter 43 being such as to sever the work with a shear cut.

The feed device and the upper movable member of the cutting device both being connected with the lever-arms 36 and 51, respectively, of the rock-shaft 34 are caused to operate relative to each other as follows: During the backward throw of the arms 36 and 51 in a direction toward the rear end of the machine the feed device is moved forward with the work engaged thereby, and the cutter 43, or the forward end thereof, is raised above the lower stationary cutter to permit of the entry of the work between the same. Then upon the return throw of the arms 36 and 51 the feed device is moved backward in its lowered position, allowing the work to remain stationary upon the bed-plate of the machine, and the cutter 43 is caused to move downward and coast with the lower cutter in severing or splitting the now stationary work fed between the same.

The longitudinal movement of the feed device and the length of cut by the blade 43 may be regulated in any suitable manner, the means for such purpose, as herein shown, being as follows: The arms 36 and 51 of the rock-shaft 34 are each provided with a longitudinal slot (indicated at 36' and 51', respectively) formed therein, in which are adjustably secured the bolts or pins, (indicated at 36<sup>2</sup> and 52<sup>2</sup>,) with which the ends of the rods 36 and 50 pivotally connect. By adjusting the position of these pivot pins or bolts a greater or less distance from the axis of the rock-shaft 34 the movement of the rods 37 and 50, and thereby the connecting feed de-

vice and cutter-blade, will be rendered greater or less accordingly, as will be readily understood. A greater longitudinal movement of the cloth-feed device 20 to produce a longer or coarser stitch should in order to secure the best results be accompanied by a more extensive cutting movement of the blade 43. Hence said parts are provided with separate adjusting means for independently and relatively regulating the lengths or extents of their movements, as described. By said means, also, the movement of the blade 43 may be regulated to give the best cutting action without changing the length.

Extending rearwardly from a point adjacent to the rear end of the cutters are two raised guide-plates 52 52. These plates meet at their forward end, so as to enter between the severed or split portions of the work and guide the latter relative to the cutters, and extend from such point in diverging directions past the opposite sides of the vertical portion of the arm 2, so as to separate and guide the severed portions of the work away from each other, such separating, spreading apart, and stretching of the work adjacent to the cutters at the cutting-point also serving to aid the operation of the latter, in that any lateral binding of the work against the cutter is prevented. The guide-plates 52 52 are inclined laterally toward each other, so that the work may more readily pass over the same, and are secured in position by screws 53, which connect the same with the bed-plate and arm of the machine, as shown.

As a convenient means for guiding the work as it is fed beneath the presser-foot, particularly if such work is grass matting or other similar material, which is usually formed with more or less well defined parallel grooves or depressions in its surface, I have provided the throat-plate 54 with a raised rib 55 extending in the direction of movement of the work and adapted to enter a groove or depression in the under side of the latter, and supporting a spring-pressed guide-plate 56 in vertical alinement above the rib 55, which is adapted to bear upon the upper surface of the work within a groove or depression therein, whereby the work will be guided in a straight line and held against undue lateral movement. For certain kinds of work it may be desirable to substitute a throat-plate with a smooth upper surface in lieu of the ribbed plate 54 and simply employ the upper guide-plate 56, which will rest upon the upper surface of the work and enable the latter to be guided by the operator, causing some marking line or feature thereon to follow beneath the said guide-plate. The guide-plate 56 is carried on one end of a lever 57, which is pivotally supported upon the shank of the presser-foot by a screw 58, and is caused to bear with a yielding pressure upon

the upper surface of the work by means of a coiled spring 59, which rests upon the presser-foot and bears upward against the under side of the rear end of the lever 57, as clearly shown in Fig. 1.

Having thus set forth one practical embodiment of my invention, I do not wish to be understood as confining myself to the particular details of construction and arrangements of parts as set forth, as the same may be more or less materially modified without departure from my invention, for

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

1. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, and a supporting-frame arm 2, of a feeding device arranged to feed toward the base of said arm, a cutting device independent of the sewing mechanism located in the path of the work as it is fed from said sewing mechanism and in position to cut or split the same between the two rows of stitching so that the two parts of the work may pass one at each side of said arm, and means for actuating said feeding and cutting devices and causing them to alternately act upon the work.

2. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, and a supporting-frame arm 2, of a feeding device arranged to feed toward the base of said arm, a pivoted cutting device located between the sewing-point and the base of said arm in the path of the work as it is fed from the sewing mechanism and in position to cut or split the same between the two rows of stitching, and means for actuating said feeding and cutting devices and causing them to alternately act upon the work.

3. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, and a supporting-frame arm 2, of a feeding device arranged to feed toward the base of said arm, a pivoted cutting device supported upon the bed-plate of the machine in a position to cut or split the work between the two rows of stitching as it is fed from the sewing mechanism on a line extending from the stitching-point to the base of said arm, and means for actuating said feeding and cutting devices and causing them to alternately act upon the work.

4. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, of a feeding device, a cutting device independent of the sewing mechanism located in the path of the work as it is fed from said sewing mechanism and in a position to cut or split the same between the two rows of stitching, means for actuating said feeding and cutting

devices and causing them to alternately act upon the work, comprising a transverse rock-shaft 34, and separate adjustable connections from said rock-shaft to the feeding and

5 cutting devices, substantially as set forth.

5. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching comprising a needle-actuating shaft and an over-  
10 hanging support carrying the same, of a feeding device for feeding the material parallel with the said needle-shaft and support, a pivoted cutting device located in position to cut or split the work between the rows of stitch-  
15 ing in a line parallel with the said needle-shaft support as the work is fed from the sewing mechanism, and a rock-shaft arranged transversely to said needle-actuating shaft and supported on the under side of the bed-  
20 plate of the machine, said rock-shaft having operative connections with the said feeding and cutting devices for actuating the same, substantially as set forth.

6. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, of a cutting device located in the path of the work as it is fed from the sewing mechanism and in position to cut or split the same between the  
30 two rows of stitching, means located at the rear of the cutting device at each side of the line of cut for spreading apart the severed portions of the work, and stretching the material evenly at the point of cutting and means  
35 for automatically feeding the work to the cutting device and forcing the same past the said separating means.

7. In a machine of the character described, the combination, with a sewing mechanism  
40 for making a double row of stitching, of a pivoted cutting device supported upon the bed-plate of the machine in a position to act upon the work between the two rows of stitching as it is fed from the sewing mechanism, actuating means for said cutting device  
45 comprising a connection extending through the said bed-plate, and two raised flanges extending in diverging directions from a point adjacent to the rear end of the cutting device  
50 and at opposite sides of said actuating connection.

8. In a machine of the character described, the combination, with a sewing mechanism for making a double row of stitching, of a  
55 cutting device located in the path of the work as it is fed from the sewing mechanism, two raised flanges extending in diverging directions from a point adjacent to the rear end of the cutting device and in line therewith, and  
60 means for automatically feeding the work to the cutter and forcing the same past the said diverging flanges, for the purpose set forth.

9. In a machine of the character described, the combination, with a sewing mechanism,

of a guide for the work arranged below the same and having an upwardly presented edge and a guide above the work having a downwardly-presented edge in line with the edge of the lower guide, said guides being arranged to act on the work in advance of the  
70 presser-foot and direct the same in a flat condition, and a cutting device, substantially as set forth.

10. In a machine of the character described, the combination of a sewing mechanism, two cooperating guides arranged to en-  
75 gage with the work at the upper and under sides thereof in advance of the presser-foot, the presser-foot, the presser-bar with which the upper of said guides is connected mov-  
80 ably on a horizontal pivot allowing its outer end a vertical oscillation relative to the lower guide, and a cutting device, substantially as set forth.

11. In a machine of the character de-  
85 scribed, the combination, with a presser-foot and a sewing mechanism, of two cooperating guides located in advance of said presser-foot and being arranged to cooperate with the work at the upper and under sides thereof,  
90 the upper guides being pivoted to the presser, a spring for normally holding said upper guides in operative position and a cutting mechanism situated at the rear of the presser-foot and having its cutting line coinciding with  
95 the line of said guides.

12. In a sewing-machine of the character described, the combination of stitching mechanism comprising two needles, feeding de-  
100 vices, a cutter at the rear of the needles operating to sever the stitched work between the two rows of stitches, and means adjacent to the cutter for deflecting both of the stitched edges evenly in opposite directions away  
105 from the cutting-line, whereby the work is stretched at the point of cutting.

13. In a machine of the character described, the combination of a bed-plate, stitching mechanism comprising two needles, a power-shaft above the bed-plate for oper-  
110 ating said needles, two rotary shafts beneath the bed-plate parallel with and operated by said power-shaft, two loopers one for each needle turning on an axis transverse to said rotary shafts and actuated by the latter, and  
115 a rock-shaft arranged transversely to said two rotary shafts and actuated by one of them, a feeding device connected with said rock-shaft and actuated in directions transverse to the same, and a cutter also actuated by said rock-  
120 shaft and acting on a line between the needles and parallel with the said power-shaft.

14. In a machine of the character described, the combination of a bed-plate, a main shaft arranged longitudinally of the  
125 machine, stitching mechanism comprising two needles arranged one at each side of the longitudinal line of the machine, two rotary



shafts also arranged one at each side of said line and beneath the bed-plate, two loopers one for each needle turning in planes longitudinal of the machine and actuated respectively by said rotary shafts, a transverse rock-shaft beneath the bed-plate actuated by one of said rotary shafts, a feeding device acting longitudinally of the machine and op-

erated by said rock-shaft, and a cutter acting on the longitudinal line of the machine and operated by said rock-shaft. 10

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