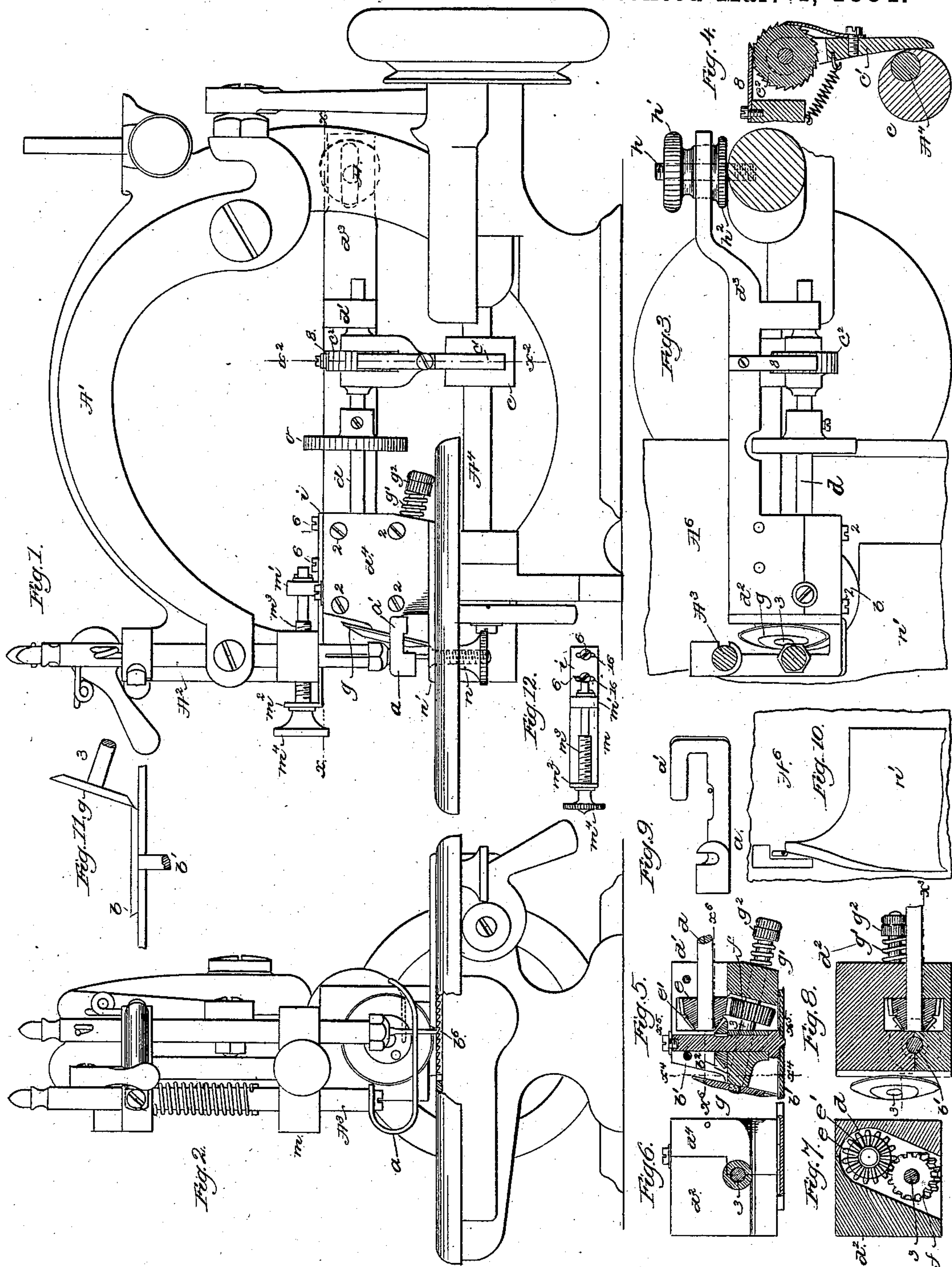


(No Model.)

W. F. BEARDSLEE.
SEWING MACHINE TRIMMER.

No. 294,432.

Patented Mar. 4, 1884.



Witnesses.

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WILLIAM F. BEARDSLEE, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE TRIMMER.

SPECIFICATION forming part of Letters Patent No. 294,432, dated March 4, 1884.

Application filed July 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BEARDSLEE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has reference to mechanism for trimming the edge of knit fabrics while being sewed by a sewing-machine, either specially adapted or of ordinary construction.

My invention, although more specially designed for trimming knit fabrics, can be used on various other material.

My improvements are shown as attached to a Willcox & Gibbs machine; but other forms of sewing mechanism adapted to the work to be done can be used equally as well.

My invention has for its object the production of an efficient trimming apparatus having rotary cutting-disks to cut the material rapidly and accurately, and which, while trimming the material parallel with the seam, may be adjusted laterally with relation to the needle when it is desired to trim the material more or less distant from the needle. In my novel organization I employ two disks or cutters of the same or unequal diameter, between which the material to be trimmed is passed, the said disks being rotated intermittingly in unison with the feed. One of the cutting-disks is arranged with its face substantially parallel with the acting face of the feed-dog or with the support on which the material being sewed rests; but the other cutting-disk co-operating with it is set with its face at an angle to the face of the disk first referred to. In connection with these cutting-disks, besides a suitable feed and presser-foot, I use a smoother composed of an arm, preferably attached to the presser-foot and adapted to bear upon the material being trimmed outside the seam when the presser-foot is down and the disks are at rest, to prevent the material from curling up or plaiting while the operator is holding the goods preparatory to the next operation of the feed and cutting disks.

My invention consists, essentially, in a trimming mechanism containing two rotating cutting-disks, one of which has its face substan-

tially parallel with the acting face of the feed or with the face of the work-support, while the second disk has its face set at an angle thereto, the edges of the said disks being arranged with relation to each other to form a common cutting-point, the edges of both disks operating at the same time to sever the material at the same point.

My invention also consists in other combinations of mechanism, which will be hereinafter described, and set forth in the claims at the end of this specification.

Figure 1, inside elevation, represents a Willcox & Gibbs sewing-machine with my improvements attached. Fig. 2 is a front elevation of Fig. 1. Fig. 3 is a section on the line $x x$, Fig. 1, looking down. Fig. 4 is a section on the line $x^2 x^2$, Fig. 1. Fig. 5 is a section of Fig. 8 on the dotted line x^3 . Fig. 6 is a section of Fig. 5 on the dotted line x^4 . Fig. 7 is a section of Fig. 5 on the dotted line x^5 . Fig. 8 is a section of Fig. 5 on the dotted line x^6 . Fig. 9 is a plan view of the presser-foot and smoother attached to it. Fig. 10 is a detail illustrating a lifter, to be described. Fig. 11 is a modification, to be referred to; and Fig. 12 is a detail of the screw and plate instrumental in adjusting the attachment-frame laterally with relation to the needle and line of feed.

In the drawings, the frame-work A, needle-actuating arm A', needle-bar A², presser-bar A³, and rotating hook-shaft A⁴, and cloth plate or support A⁶ are all as in the Willcox & Gibbs machine, so need not be herein further described. Upon the presser-bar I apply the presser-foot a , it having projecting from one side of it the smoother a' —either a rigid or elastic arm—the under side of which is sufficiently high to rest upon the material above that one of the cutting-disks, b , the face of which is parallel with the acting face of the feed b^6 or the work-support, while the under portion of the main part of the said presser-foot rests upon the material above the regular cloth-plate of the machine. This smoother, (shown elevated, the presser-foot being lifted in Figs. 1 and 2,) when it is in its lowest position, will descend upon the material resting between it and the face of the disk b , smoothing or pressing upon the said material as the usual feeding device retires from engagement

therewith, and while the cutting-disks are at rest and the usual needle is in the material. The hook-shaft A^4 has attached to it a suitable cam, c , which acts upon a lever or arm, c' , having a suitable pawl, which engages a ratchet, c^2 , fast on the main shaft d of the trimming attachment, the said cam and pawl and ratchet imparting to the said shaft an intermitting motion of greater or less extent, according to the length of the stroke it is desired to impart to the cutters, that being in proportion to the length of feed; but instead of the particular pawl and ratchet shown, I desire it to be understood that I may employ a friction-pawl mechanism of any usual and suitable construction, and any usual means may be employed to move the arm c' a greater or less distance, and consequently turn the shaft d more or less at each rotation of the hook-shaft. The detent 8 prevents retrograde movement of the shaft d . The shaft d has its bearing in suitable ears, d' , of the attachment-frame d^2 , the latter having a backwardly-extended arm, d^3 , and a cap or cover, d^4 , making a box-like head, to inclose the gearing to be described. The cap is attached by screws 2. The end of the shaft d is provided with a bevel-gear, e , having a bevel-gear, e' , attached to it. The gear e engages a gear, f , fast on an inclined shaft, 3, having its bearings in the attachment-frame, and provided at one end with the cutting-disk g , the face of which is set at an inclination with relation to the face of the cutting-disk b , which disk b is attached to the lower end of a shaft, b' , which also has its bearings in the said attachment-frame, both of the said disks being made movable bodily with the said frame. The lower end of the shaft 3, opposite that carrying the cutting-disk g , is surrounded by a spring, g' , and has one or more nuts, g^2 , attached to it, so that the said spring acts to normally draw the said shaft longitudinally and keep the cutting-edge of the disk g in proper cutting position with relation to the edge of the co-operating cutting-disk b , thus enabling the two edges of the said cutters to always operate together properly, notwithstanding wear, and materially aid in keeping the cutting-edges of the disks in good working order. As the shafts 3 and b' cross each other, the edge of the disk g would apparently not come into the proper place with relation to the edge of the disk b ; but as the disk g drops slightly below the cutting-edge of the disk b , the cutting-edges of the two disks are brought in such position that the edge of g comes to the edge of disk b in its central line. The spring g' keeps the edge of disk g against the edge of disk b , and as heavy material requires greater power to cut it than light material, the pressure between the disks may be properly varied by adjusting the nuts g^2 , thus more or less compressing the spring g' . The shaft b' derives its motion of rotation from the bevel-gear e' , which engages the bevel-gear b^2 , fast on the said shaft. The arm d^3 of the attachment-frame is slotted and applied in an

adjustable manner upon a screw, h , fastened to the frame A , and at opposite sides of the said arm the said screw is provided with two adjustable nuts, $h' h^2$, the movement of the said nuts in the same direction on the screw enabling them to adjust the rear end of the said arm backward or forward with relation to the shaft A^4 , and when such adjustment is made the screws 6 6, extended through slots 16 in the adjustable plate i into the attachment-frame, will be loosened, thus permitting the head part of the said frame to be adjusted backward or forward in the direction of the feed, so as to place the cutting-points of the said disks more or less close to the needle. The face of the cutting-disk b is parallel, or substantially so, with the acting face of the feed and of the usual cloth-plate, or the throat-plate therein, and for most of the time the lower end of shaft b' will just touch the cloth-plate A^6 . The attachment-frame is held at the proper height, so as to place the said cutting-disk in proper relation to the cloth-plate by means of the screws 6 6 inserted through the plate i , forming part of a yoke, m , having suitable ears, $m' m^2$, which receive a screw, m^3 , the threaded shank of which is extended through a threaded hole made in the head of the machine, between the needle and presser bars, the rotation of the said screw, by engaging its head m^4 , causing the plate i to be moved lengthwise of the machine, or laterally with relation to the needle and the direction of the feed. During this adjustment of the cutting attachment to trim the material more or less distant from the line of stitching produced by the needle, the thread, and sewing parts, the nuts $h' h^2$, holding the rear end of the extension d^3 , are loosened. This adjustment may be made while the machine is stitching. The width of cam or eccentric c is sufficient to enable the cam to always actuate the lever c' , which is instrumental in moving the shaft d .

In order to raise or lead the material being stitched and trimmed up to the level of the face of the cutting-disk b , I have attached to the usual cloth-plate by a screw, n , in front of the needle, a lifting-plate, n' , the edge of which is beveled. Instead, however, of this lifting-plate, the cloth-plate might be cut out and the cutting-disk b be placed in it with its upper side or face flush with the cloth-plate. The disk b is herein shown as larger in diameter than the disk g , to gain width for the reception between the disks of the edge of the material to be trimmed, the space into which the edge to be trimmed off passes being limited, it will be seen, by the diameter of the disk b . The milled wheel o on the shaft d permits the cutting-disks to be operated by hand when starting to trim an article or for any other purpose desired. The disk b having been arranged with its face or upper side in proper position with relation to the cloth-plate and acting face of the feed, the face of the disk g may be more

or less inclined with relation to the face of the disk *b*—as, for instance, it may be arranged at an acute angle, as in Figs. 1 to 8, or may be at an obtuse angle, as shown in Fig. 11; but in this latter event the shaft *b'* would be extended downward, and be driven from the hook-shaft by gearing located below the cloth-plate.

The mechanism for driving the two disk-cutters having the described arrangement with relation to each other and the feed and the cloth-work support may be variously modified, according to the sewing-machine with which the said disks are to be employed, and this without departing from my invention. By raising the disk *b* sufficiently above the cloth-plate to pass beneath it one part of the material being sewed, a single thickness of the said material beyond the line of stitching joining it with the material extended under the disk *b* may be inserted between the disks and be cut off parallel with the seam. This plan permits the edge of a hem to be cut off.

I am aware that two disks or circular knives arranged at the ends of two horizontal shafts have been used to cut different materials, and to cut cloth or other material for hat-work; but in no instances known to me have two cutting-disks been arranged to trim material parallel with an irregular or curved line of stitching being made. Two rotating cutting-disks attached to horizontal shafts such as heretofore employed cannot be combined with a sewing mechanism to cut or to trim the edge of material close to the seam or line of stitching, and as the seam is being made in curved or irregular lines.

I am aware that a single cutting-disk having a truly circular cutting-edge and a single disk having an irregular edge have been used to trim material close to the seam or line of stitching being made.

The smoother, instead of being attached to the presser-foot pad, may be pivoted at some other point on the presser-bar and be made adjustable vertically.

I have herein described my improved trimming mechanism as adapted for use in connection with a sewing-machine; but it is obvious that the same would operate to cut cloth, &c., if driven by other mechanism than a sewing-machine, and it could be made to cut fabrics which were not being sewed on a sewing-machine.

I claim—

1. The combination, with an organized sewing mechanism, of the two cutting-disks *b* and *g*, rotated positively and in unison by gearing and their shafts *b'* and 3, placed at an angle with relation to each other, as set forth, whereby the edge of disk *g* is enabled to pass the edge of disk *b*, and a spring to keep the edges of the disks together, the two disks having a common cutting-point located at a point substantially diametrically opposite the needle and stitching-point, as shown and described, whereby the stitching and cutting operations

are essentially simultaneous and the disks kept sharp, as specified.

2. In a sewing-machine, the rotating cutting-disk *b*, having its face arranged substantially parallel with relation to the acting face of the feed or the work-support, and the rotating disk *g*, having its face set at an angle with relation to disk *b*, combined with the presser-foot and the smoother adapted to bear upon the material above the disk *b*, as and for the purpose set forth.

3. The combination, with stitch-forming mechanism in a sewing-machine, of a rotating cutting-disk, *b*, adapted to rotate in a plane substantially parallel with the acting face of the feed or the face of the work-support, a rotating disk, *g*, adapted to rotate in a plane angular thereto, an attachment-frame to support the shafts of the said disks, and means to adjust the said frame horizontally while the machine is in operation, substantially as described.

4. The combination, with stitch-forming mechanism in a sewing-machine, of a rotating cutting-disk, *b*, adapted to rotate in a plane substantially parallel with the acting face of the feed or the face of the work-support, a rotating disk, *g*, adapted to rotate in a plane angular thereto, an attachment-frame to support the shafts of the said disks, and means to adjust the said frame backward and forward with relation to the feed of the material, substantially as described.

5. The combination, with stitch-forming mechanism in a sewing-machine, of a rotating cutting-disk, *b*, adapted to rotate in a plane substantially parallel with the acting face of the feed or the face of the work-support, and a rotating disk, *g*, adapted to rotate in a plane angular thereto, an attachment-frame to support the shafts of the said disks, and means to adjust the said attachment-frame both laterally and lengthwise with relation to the direction of the feed, substantially as described.

6. The combination, with the stitching mechanism of a sewing-machine, of a rotating disk, *b*, having its face arranged substantially parallel with the cloth-support, a cutting-disk, *g*, having its face placed at an angle thereto, and an attachment-frame supported above the cloth-plate, leaving a space between the trimming mechanism and the cloth-plate, substantially as described.

7. In a sewing-machine, the combination, with stitching mechanism and two rotating cutters, *b g*, having their faces placed at an angle with relation to each other, as shown and described, of a presser-foot and a smoother to hold at both sides of the disk *g* the material being sewed and trimmed, substantially as described.

8. The stitch-forming mechanism of a sewing-machine, combined with two cutting-disks, *b g*, and means to positively rotate them, the said disks having their faces inclined with relation to each other, and having

a common cutting-point located at a point substantially diametrically opposite the needle and stitching-point and in close proximity thereto, as shown and described, whereby the stitching and cutting operations are essentially simultaneous, as set forth.

9. The stitching mechanism and cloth plate or support and attached lifting-plate, combined with the attachment-frame and its two rotating cutting-disks *b g*, arranged as described with relation to each other and the cloth-plate, substantially as set forth.

10. A sewing - machine combined with a trimming mechanism for attachment thereto, the latter comprising two cutting-disks and means to positively rotate each, one of such disks having its face substantially parallel

with relation to the acting face of the feed or work-support, while the face of the other disk is arranged at an angle thereto, so that the meeting edges of such disks constitute a common cutting-point located at a point substantially diametrically opposite the needle and stitching - point, as shown and described, whereby the stitching and cutting operations are essentially simultaneous, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM F. BEARDSLEE.

Witnesses:

G. W. GREGORY,
W. H. SIGSTON.