J. C. RINGE.

STRIP SEVERING DEVICE FOR SEWING MACHINES.

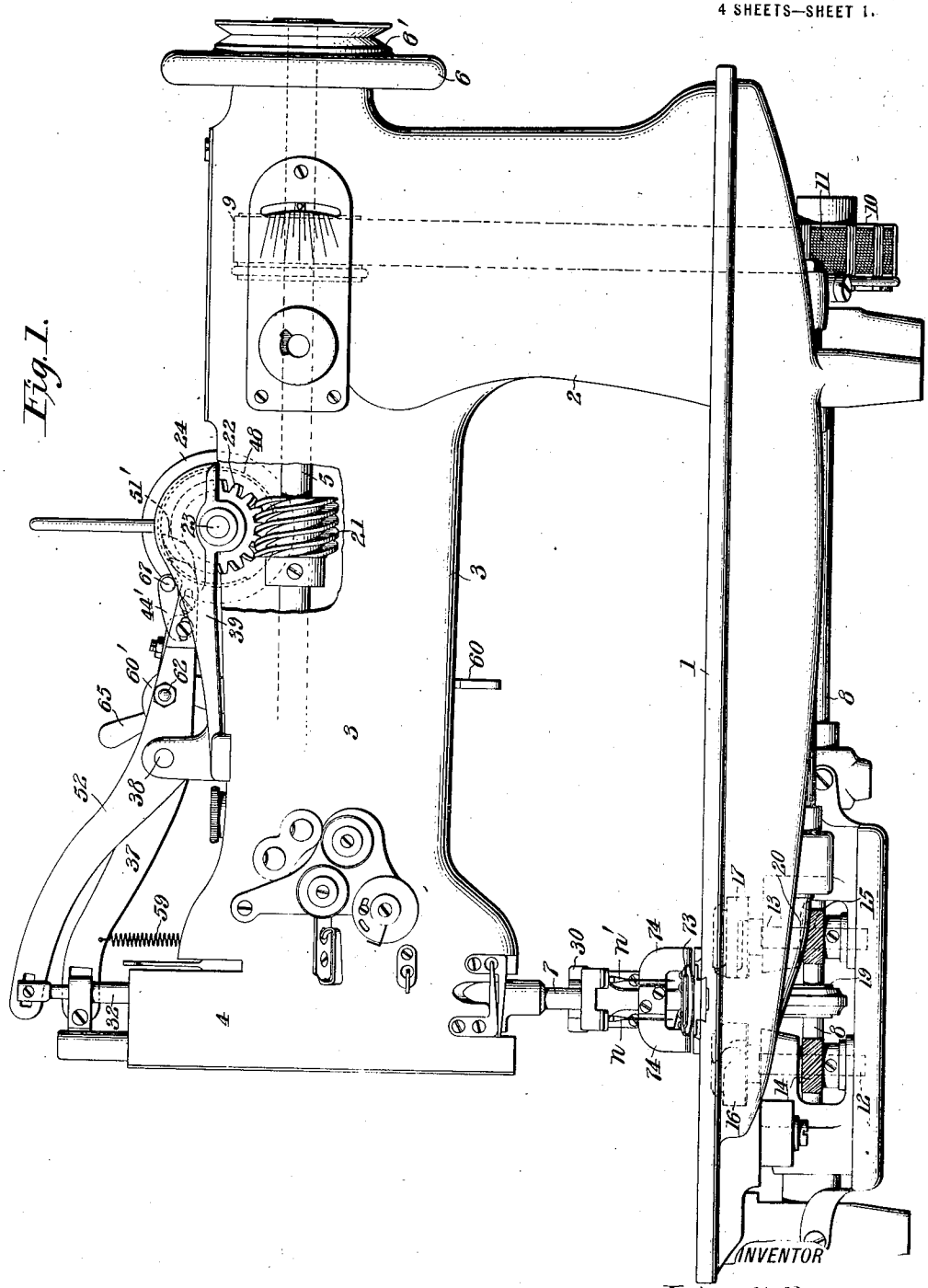
APPLICATION FILED JAN. 4, 1918.

1,387,012.

Patented Aug. 9, 1921.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

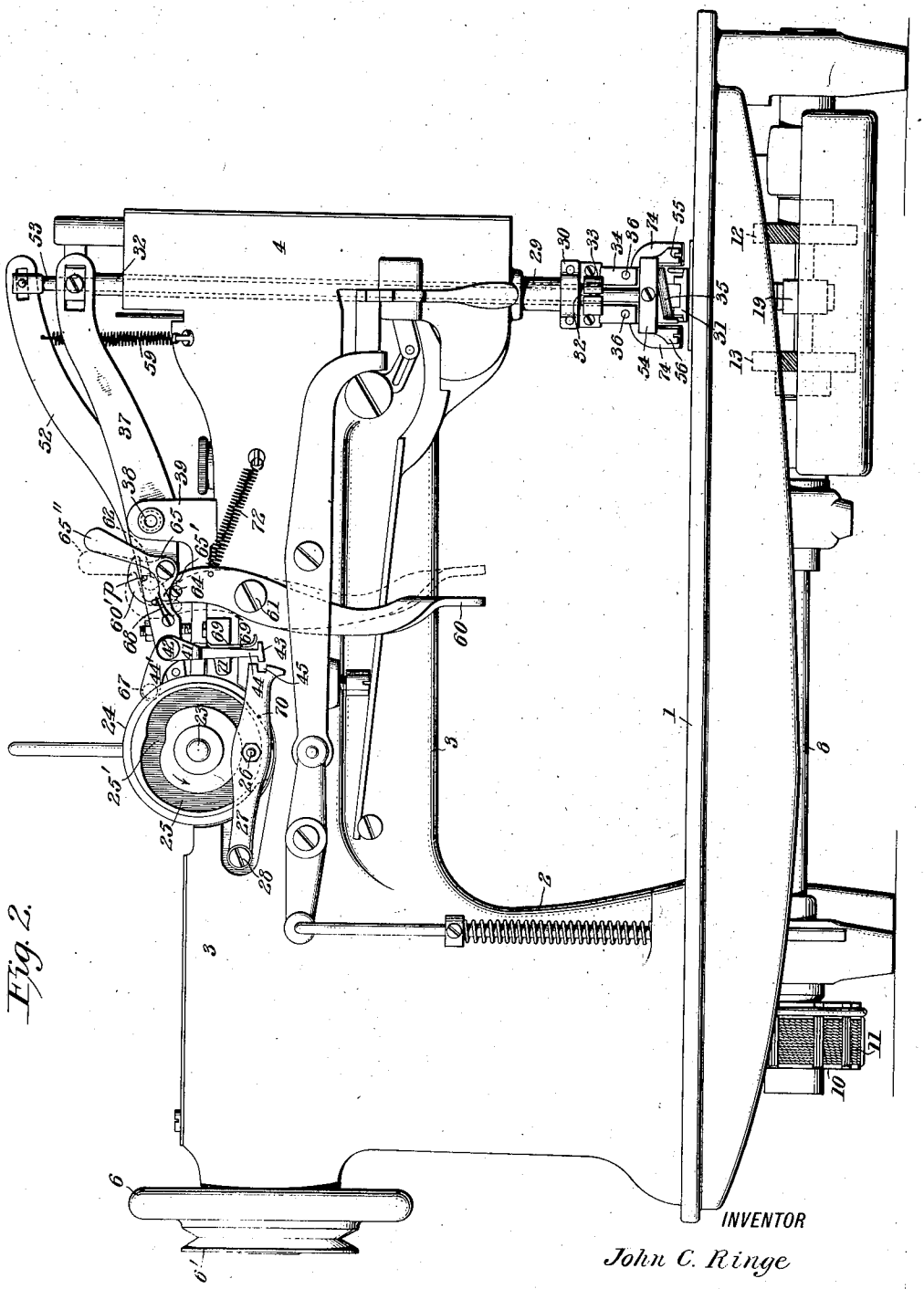


Fig. 2.

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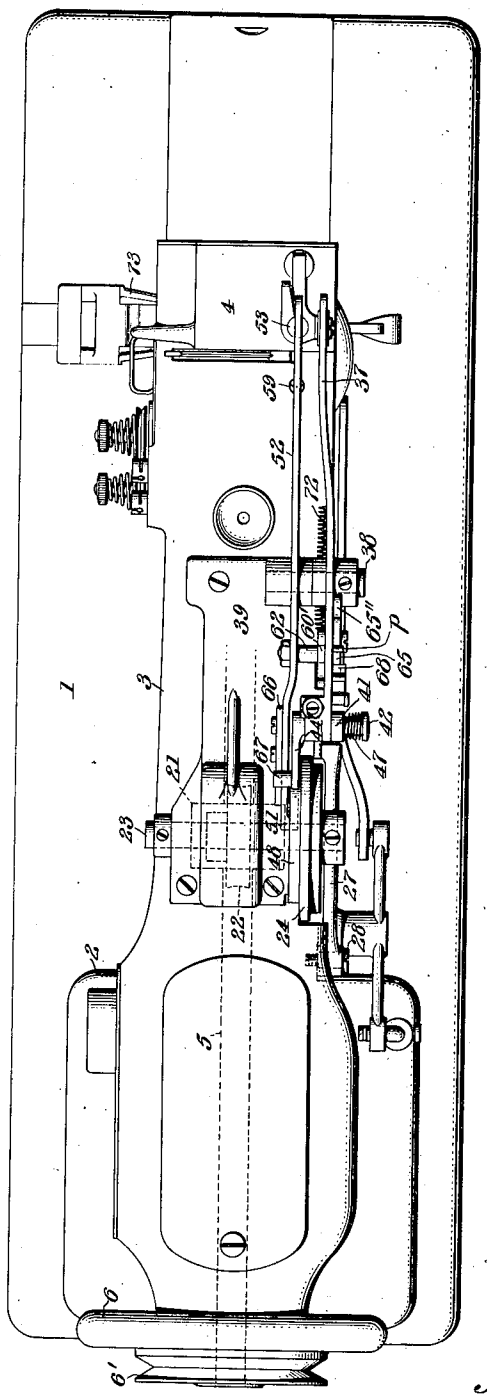
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4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 5.

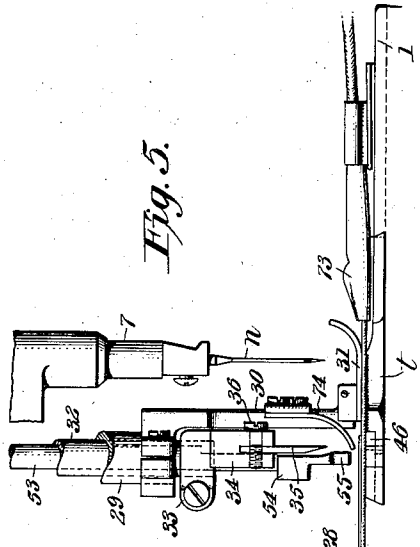


Fig. 6.

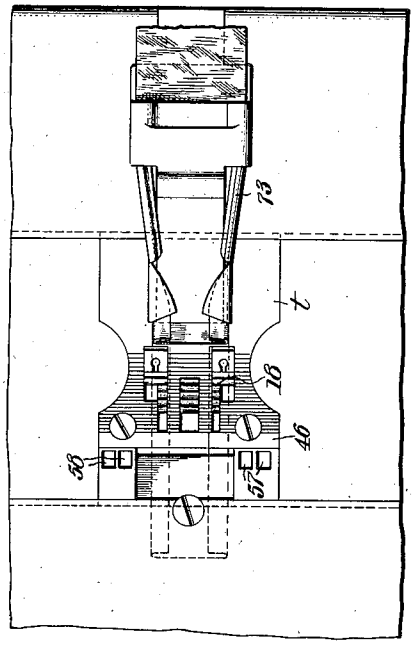


Fig. 4.

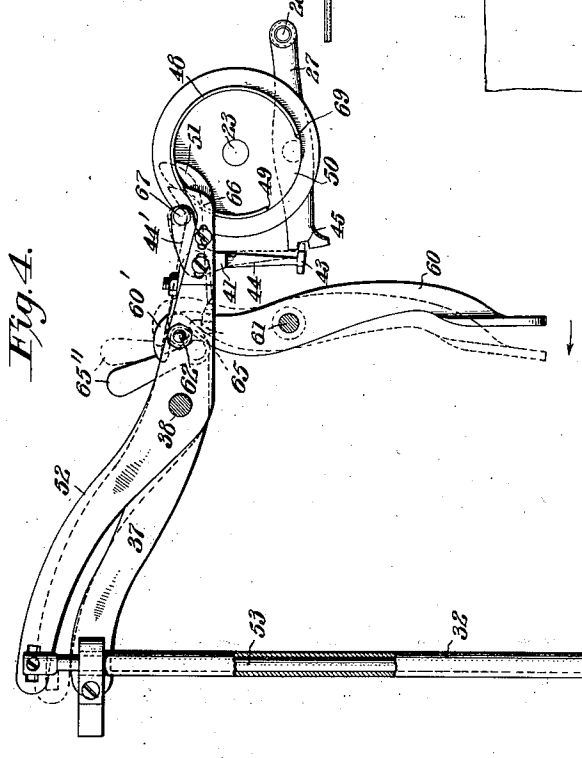
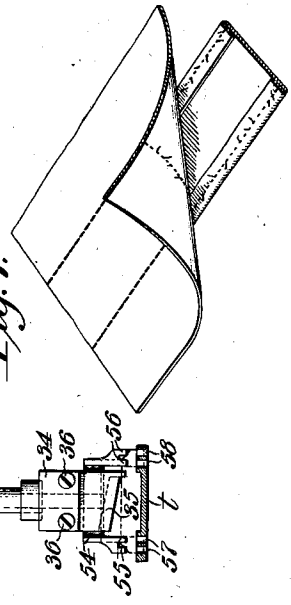


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN C. RINGE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

STRIP-SEVERING DEVICE FOR SEWING-MACHINES.

1,387,012. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed January 4, 1918. Serial No. 210,350.

To all whom it may concern:

Be it known that I, JOHN C. RINGE, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Strip-Severing Devices for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in sewing machines but is directed more particularly to the stitching of a stay-strip or tape to wearing apparel.

In the manufacture of certain garments, particularly corsets, it is necessary to form stay-pockets comprising a suitable tape folded and stitched at the edges and into these pockets are inserted stays of metal, bone or other suitable material.

The primary object of the present invention is to form such pockets and to automatically sever the stay-pocket tape between successive garments.

A further object is to provide positively controlled means for preventing the cutting action while the garment is being acted upon.

Another object is to provide means whereby the operator may throw into and out of action the automatically controlled tape-cutting mechanism during the operation of the machine.

Other objects will be apparent from this specification when taken in connection with the accompanying drawings.

In the forming of stay-pockets it has been customary to stitch the tape, stop the machine, pull out the garment, sever the tape with a pair of shears and then start the machine for the succeeding garment.

The present invention is particularly advantageous as it permits the operation of a continuously running machine which folds, stitches and automatically severs the stay-tape between garments, thus eliminating the starting and stopping of the machine for each garment and also the manual cutting of the stay-tape all of which require considerable time.

As shown in the drawings, Figure 1 is a front elevation of one variety of Singer commercial sewing machines fitted with the present invention, a part of the arm being broken away to bring to view the prime member of the cutter-actuating mechanism. Fig. 2 is a rear side view of Fig. 1. Fig. 3 is a plan view of Fig. 2. Fig. 4 is a detail of the improved mechanism detached from the machine as viewed from the front, the tubular presser-bar, later to be referred to, being omitted. Fig. 5 is a side elevation of the presser-foot, tape-cutter and other parts later to be referred to. Fig. 6 is a detail plan view of the bed-plate, throat-plate, strip-folder and feed-dog. Fig. 7 is so much of a garment as is necessary to illustrate one variety of product.

Referring to the figures, the machine is constructed with the usual bed-plate 1, upon which is mounted the bracket-arm comprising the arm standard 2 and arm-bracket 3, which terminates in the head 4.

Within the bracket-arm 3 there is journaled the main-shaft 5, provided at its rearward end with the hand-wheel 6, carrying the belt-pulley 6′ and at its forward end operatively connected with the needle-bar 7, in a manner common to sewing machines generally and adapted to reciprocate the needle-bar and carry the needles n, n'.

Beneath the bed-plate 1 there is journaled in suitable bearings the looper-actuating shaft 8 which is driven from the main-shaft by pulleys 9—10 and belt 11.

Upon the forward end of the shaft 8 there are fixed the gears 12 and 13 which mesh with gears 14 and 15 respectively, fixed upon commonly employed looper-shafts (not shown) to rotate the loopers 16, 17.

The feed-dog 18 is operatively connected to the feed-lift eccentric 19 on the shaft 8 and derives its feeding movements from the feed rock-shaft 20, as in earlier constructions.

As the stitch-forming and fabric-feeding mechanisms as herein shown are similar to other varieties of Singer commercial sewing machines, the foregoing description is deemed sufficient.

Intermediate the ends of the main-shaft 5 there is suitably secured the prime member or worm-gear 21 which meshes with the gear-member 22 suitably secured upon the transverse shaft 23 journaled in suitable bearings formed in the bracket 39 suitably secured upon the arm-bracket, said worm-gear and gear-member transmitting power to operate the tape-severing mechanism now to be described.

The shaft 23 carries a cam-disk 24 provided with a heart-shaped cam-groove 25

which is tracked by a roller 26 carried by a rock-arm 27 fulcrumed at 28 to the arm 3.

Within the head 4 there is slidably mounted the tubular presser-bar 29 carrying at its lower end the presser-bracket 30 provided with the pivoted presser-foot 31. Through the bar 29 there extends a hollow cutter-bar 32, upon the lower end of which is secured by pinch collar 33 a cutter-head 34 carrying a cutter-blade 35 secured by screws, as 36. The cutter-bar 32 is adapted to be reciprocated within the bar 29 by means of its connection with the cutter-actuating lever 37 fulcrumed upon the pin 38 carried by the bracket 39. The lever 37 receives its rocking motion from the rock-arm 27 which in turn is actuated by the cam-groove 25.

A bellcrank trip-lever 41 fulcrumed upon a pin 42 carried by the lever 37 acts, at certain times, to couple said lever and the rock-arm 27, said coupling being effected by the head 43, forming a part of the arm 44 of the trip-lever 41, entering the notch 45 located in the end of the rock-arm 27. Thus it will be seen that the rocking motion of the arm 27 will cause reciprocation of the cutter-bar 32 and cause the blade 35 to cooperate with the ledger-blade 46 carried by the throat-plate *t* to sever the stay-tape. The spring 47 wound about the pin 42 normally acts upon trip-lever to hold it out of contact with the rock-arm 27.

As it is desired to cut the stay-tape only after the garment has passed beneath the presser-foot there is employed means, now to be described, which prevents the cutting action except at such time.

Upon the disk 24 there is formed a circular rib 48, part of which is cut away at 49 to provide an opening 50, see Fig. 4, the inner surface of said rib being tracked by a head 51 carried by the detector-head actuating lever 52 fulcrumed upon the pin 38 and suitably connected at its opposite end to a rod 53 slidingly held within the cutter-bar 32. The rod 53 has fixed upon its lower end a detector-head 54 provided with spaced fingers as 55 and 56 normally located slightly above the work and which are adapted to intermittently enter openings as 57 and 58, respectively, in the throat or needle-plate *t* except at such time as the garment being acted on is between said fingers and the throat-plate, it being understood that while the employment of multiple fingers and cooperating openings are preferable the employment of a single finger and opening would meet practical requirements.

A spring 59 located between the machine head and the lever 52 acts to swing the lever on its fulcrum to place the fingers 55 and 56 in the apertures 57, 58. A manually operated lever 60 fulcrumed upon the screw 61 threaded into the bracket-arm is provided with a curved head 60′ adapted to engage a stud 62 carried by the lever 52 and prevent the rocking of said lever by the spring 59 except when the cutting action is to take place.

The lever 60 carries a pin 64 upon which normally rests the spring-pressed latch 65 later to be referred to.

A contact plate 66 is adjustably secured to the lever 52 and acts upon the pin 67 carried by the arm 44′ of the trip-lever 41.

In the operation of the machine the operator having started the stitching, shifts the lever 60 to the position shown in dotted lines, Fig. 4, thus disengaging the head 60′ from the stud 62, the lever 52 being held against movement, through the resiliency of the spring 59, by the head 51 contacting the rib 48, the end 65′ of the latch 65 being forced downwardly by the spring 68 in contact with the pin 64 to maintain the lever 60 in its dotted line or adjusted position, a pin *p* acting to limit the movement of the latch 65.

The shaft 23 continues to rotate and brings the opening 50 in the rib 48 adjacent the head 51 at which time the spring 59 is at liberty to rock the lever 52 on its fulcrum and lower the fingers 55, 56.

Assuming that the garment is still being stitched the fingers will be slightly lowered and brought into contact with the material where they remain while the opening 50 is passing the head 51, the movement of the lever 52 being too slight to bring the plate 66 into contact with the pin 67.

As the beveled edge 69, of the rib 48 contacts the head 51, which will then be protruding slightly through the opening 50, the head will be forced downwardly and again raise the fingers 55, 56 slightly above the work, which action will be repeated at each revolution of the shaft 23 until the garment has passed from beneath the fingers 55, 56 when the spring 59 will rock the lever 52 to a greater extent and the fingers will enter the apertures 57 and 58. This greater rocking motion of the lever 52 causes the plate 66 to contact the pin 67 and rock the trip-lever 41 and place the head 43 within the notch 45 of the rock-arm 27. An upward movement of the arm 27, through the action of the eccentric portion 25′ of the cam-groove 25, then rocks the lever 37 causing the stay-strip to be severed.

During the cutting operation the head 43 is positively held within the notch 45 by means of the backing plate 69, due to the head 43 tracking the vertical wall 69′ of the plate 69.

The cutting being completed and arm 27 and head 43 being in their lowered position they are then disconnected by the cam surface 70 of the cam-disk 24 acting on the lug 71 of the arm 44.

As the rearward end of the lever 37 is

lifted during the cutting operation the end 65′ of the latch 65 is raised above the pin 64 and the lever 60 returned to its initial position by the spring 72.

Having shifted the lever 60 should the operator desire to reset the mechanism to omit the cutting operation a slight pressure upon the handle 65″ will lift the end 65′ and allow the lever 60 to assume its position with the head 60′ above the stud 62 which will prevent the cutting of the stay-tape.

An edge-folder and tape-guide 73 is mounted upon the bed-plate and folds the stay-tape in advance of the stitching operation and curved guide-plates 74 fixed upon the presser-bracket serve to direct the material beneath the fingers 55 and 56.

From the foregoing it is to be understood that when the lever 60 occupies its full line position, as illustrated in the figures, the cutting mechanism is adjusted to its inactive position but when it is desired to automatically sever the stay-tape the operator moves the lever 60 to its dotted line position which adjusts the parts to the positions previously described to effect the cutting operation for a single garment, the adjustment of the lever 60 to its dotted line position being repeated for each successive cutting operation.

As Fig. 7 does not include any mechanism it is not thought necessary to refer by reference characters to the superposed fabrics.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with a stitch-forming mechanism and actuating mechanism therefor including a main-shaft, a guide for guiding a stay-tape and a feeding mechanism for presenting said tape and a body-fabric to the action of said stitch-forming mechanism, a prime member carried by said main-shaft, a cutter blade and a detector-head, of means for operatively connecting said cutter-blade and detector-head with said prime member to first actuate said detector-head, followed by the prime member acting on said cutter-actuating mechanism to cause said cutter-blade to sever said stay-tape at the completion of each taping operation.

2. In a sewing machine, the combination with a stitch-forming mechanism and actuating mechanism therefor including a main-shaft, a guide for guiding a stay-tape and a feeding mechanism for presenting said tape and a body-fabric to the action of said stitch-forming mechanism, a prime member carried by said main-shaft, a cutter-blade and a detector-head, of means for operatively connecting said cutter-blade with said prime member together with means for operatively connecting said detector-head with said prime member, the latter means being controlled by the body-fabric to act on the cutter-blade actuating means to cause said prime member to transmit movements to said cutter-blade to sever the stay-tape at the completion of a taping operation.

3. In a sewing machine, the combination with a stitch-forming mechanism and actuating mechanism therefor including a main-shaft, a guide for guiding a stay-tape and a feeding mechanism for presenting said tape and a body fabric to the action of said stitch-forming mechanism, a prime member carried by said shaft, a cutter-blade and a detector-head, of means including a cam-disk for operatively connecting said cutter-blade and detector-head with said prime member to first actuate said detector-head, followed by the detector-head actuating means acting on said latter actuating means to cause said prime member to act on the latter means and cause said cutter-blade to sever said stay-tape at the completion of each taping operation.

4. In a sewing machine, a stitch-forming mechanism and actuating means therefor including a main-shaft, a guide for guiding a stay-tape, a feeding mechanism for presenting said tape and a body-fabric to the action of said stitch-forming mechanism, a stay-tape severing mechanism including a cutter-blade, a manually operated lever for operatively connecting said severing mechanism with said actuating means, a prime member carried by said shaft, a detector-head, connections for operatively connecting said cutter-blade with said prime member, connections for operatively connecting said detector-head with said latter member, and connections for operatively connecting said first train of connections with said second train to cause said prime member to act on said first train of connections and cause said cutter-blade to sever said tape at the completion of a taping operation.

5. In a sewing machine, a stitch-forming mechanism and actuating means therefor including a main-shaft, a guide for a stay-tape, a feeding mechanism for presenting said tape and a body fabric to the action of said stitch-forming mechanism, a stay-tape severing mechanism including a cutter-blade, a manually operated lever for operatively connecting said severing mechanism with said actuating means, a prime member carried by said shaft, a detector-head, connections for operatively connecting said cutter-blade with said prime member, connections for operatively connecting said detector-head with the latter member, and connections for operatively connecting said first train of connections with said second train to cause said prime member to act on said first train of connections to give to said cutting blade its severing action, said body fabric acting through the detector-head to control said latter action.

6. In a sewing machine, a stitch-forming

mechanism and actuating means therefor including a main-shaft, a guide for guiding a stay-tape, a feeding mechanism for presenting said tape and a body fabric to the action of the stitch-forming mechanism, a stay-tape severing mechanism including a cutter-blade, a manually operated lever, a prime member carried by said shaft, a cam disk operated from said prime member, a detector-head provided with a depending finger, a throat-plate provided with an opening for the reception of the latter, connections between said detector-head and said cam-disk and between the latter and said cutter-blade, and connections for operatively connecting said first train of connections with said second to through the control effected by said third train cause said cam-disk to act on said first train of connections and cause said cutter-blade to sever the stay-tape.

7. A sewing machine comprising stitch-forming and cloth feeding mechanisms including a main drive shaft and means for actuating the latter, in combination with a stay-tape severing mechanism comprising a cam-disk operated from said shaft and a guide for guiding a stay-tape, said feeding mechanism acting to present said tape and a body-fabric to the action of said stitch-forming mechanism, a throat-plate provided with an opening, a cutter-blade and actuating mechanism therefor including a cutter-actuating lever and a trip-lever, a detector-head provided with a depending finger and connections between said head and said cam-disk including a detector-head actuating lever and means carried by the latter to cause said trip-lever to operatively connect said cutter-actuating lever with said cam-disk to effect a cutting action of said cutter-blade at such time as the feed action of the body-fabric permits said depending finger to enter said opening in the throat-plate.

8. A sewing machine comprising stitch-forming and cloth-feeding mechanisms including a main-shaft and means for actuating the latter, in combination with a stay-tape severing mechanism comprising a cam-disk operatively connected with said main-shaft and a guide for guiding a stay-tape, said feeding mechanism acting to present said tape and a body fabric to the action of said stitch-forming mechanism, a rock-arm operatively connected with said cam-disk, a detector-head, a detector-head actuating lever operated from said cam-disk, a cutter-blade, a cutter-blade actuating lever carrying a bell-crank-lever acted on by said detector-head actuating lever to operatively connect said bellcrank-lever with said rock-lever to cause the cutter-blade to descend to its limit of downward movement.

9. A sewing machine comprising stitch-forming and cloth-feeding mechanisms including a main-shaft and means for actuating the latter, in combination with a stay-tape severing mechanism comprising a cam-disk operatively connected with said main-shaft and a guide for guiding a stay-tape, said feeding mechanism acting to present said tape and a body fabric to the action of said stitch-forming mechanism, a rock-arm operatively connected with said cam-disk, a detector-head, a detector-head actuating lever operated from said cam-disk, a cutter-blade, a cutter-blade actuating lever carrying a trip-lever acted on by said detector-head actuating lever to operatively connect said trip-lever with said rock-arm to cause the cutter-blade to descend to its limit of downward movement, and means for holding said trip-lever against accidental movement.

10. In a sewing machine, in combination, an actuating shaft, stitch-forming mechanism, fabric feeding mechanism for presenting the material being acted upon to the action of the stitch-forming mechanism, a prime member carried by said actuating shaft, a cutter carrier, and means controlled by the work for operatively connecting said cutter carrier with said prime member to rigidly actuate said cutter carrier by said prime member in opposite directions.

11. In a sewing machine, in combination with stitch-forming mechanism including a needle-bar, a cutter operable in the rear of the point of seam-formation, actuating means for said cutter, a detector adapted to intermittently engage the work to determine the presence thereof, means independent of said needle-bar for actuating said detector, and controlling connections between said detector and said cutter actuating means for rigidly actuating said cutter from said cutter actuating means in opposite directions.

12. In a sewing machine, in combination, an actuating shaft, stitch-forming and fabric feeding mechanisms, a prime member carried by said actuating shaft, a cutter carrier, means controlled by the work for connecting said cutter carrier with said prime member to insure actuation of said cutter carrier in opposite directions by said prime member, and means for disconnecting said prime member from said cutter actuator after one complete reciprocation of the latter.

13. In a sewing machine, in combination with stitch-forming and feeding mechanisms, a cutter operable in the rear of the point of seam-formation, means for actuating said cutter, means including a detector adapted to intermittently engage the work for initiating the actuation of said cutter after the completion of a sewing operation, and means for manually controlling the action and inaction of said detector during the operation of the machine.

14. In a sewing machine, the combination

with stitch-forming and feeding mechanisms, of a detector adapted to yieldingly engage the work, means for intermittently moving said detector away from the work, a cutter, a continuously vibrating lever normally disconnected from said cutter, and means brought into action by said detector after the completion of a sewing operation for coupling said vibrating lever with said cutter to reciprocate said cutter in opposite directions from said lever.

15. In a sewing machine, in combination with stitch-forming and feeding mechanisms, a cutter operable in the rear of the point of seam-formation, means for actuating said cutter, a work-engaging detector adapted to initiate the actuation of said cutter, means for actuating said detector, and manually controlled means operable during the operation of the machine for rendering said detector inoperative.

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

JOHN C. RINGE.

Witnesses:

EDWARD H. WOODS,

FRANK M. WOOTTON.