

G. A. KINDER.
SEWING MACHINE.
APPLICATION FILED OCT. 9, 1909.

1,061,383.

Patented May 13, 1913.

3 SHEETS—SHEET 1.

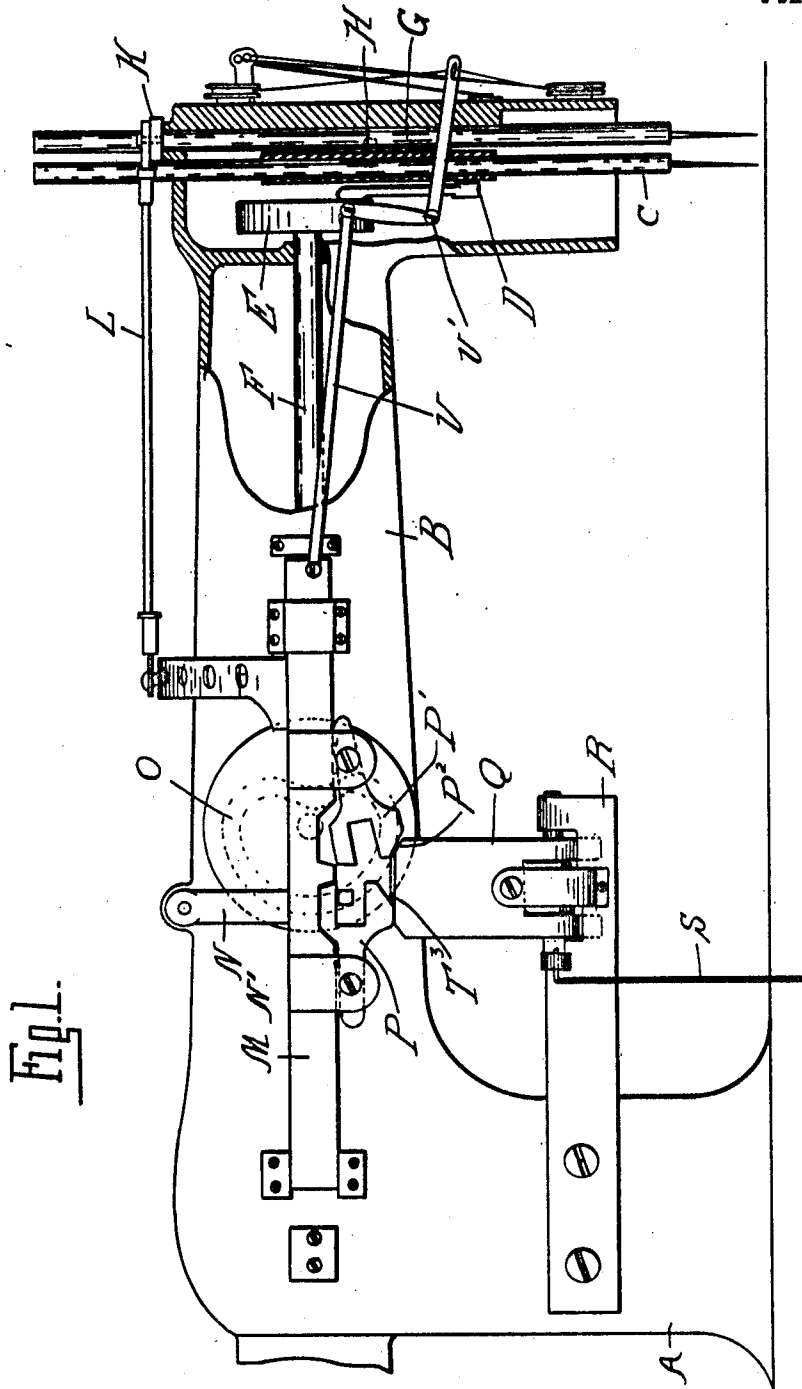


Fig. 1.

Witnesses
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H. B. Bellman

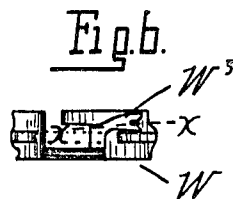
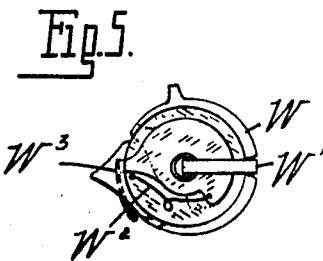
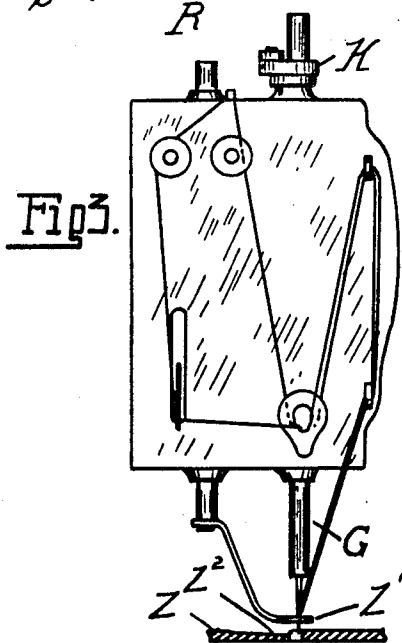
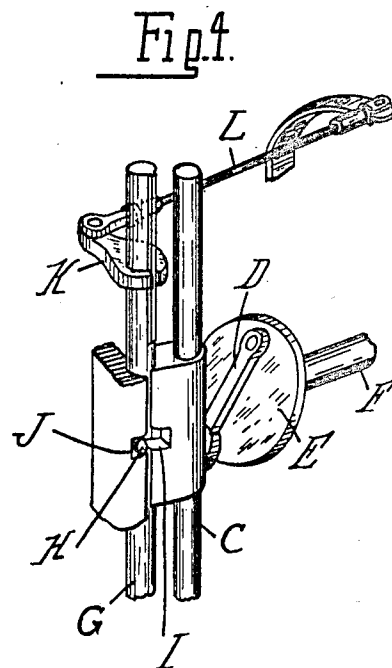
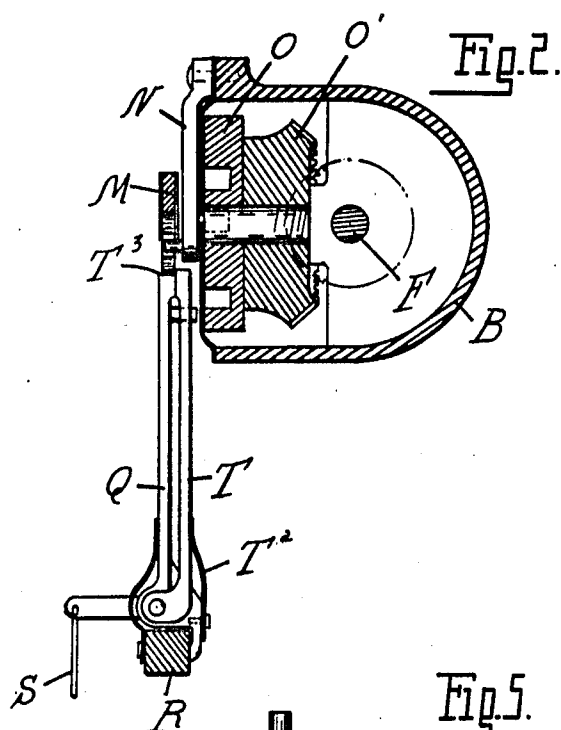
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 8.

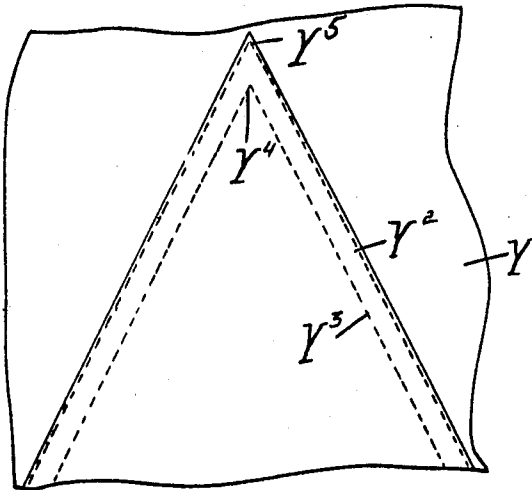


Fig. 9.

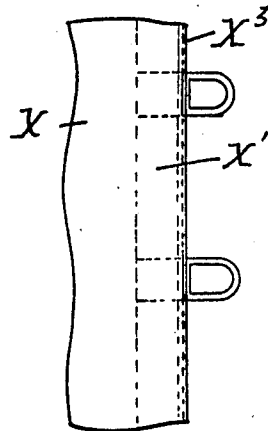


Fig. 10.

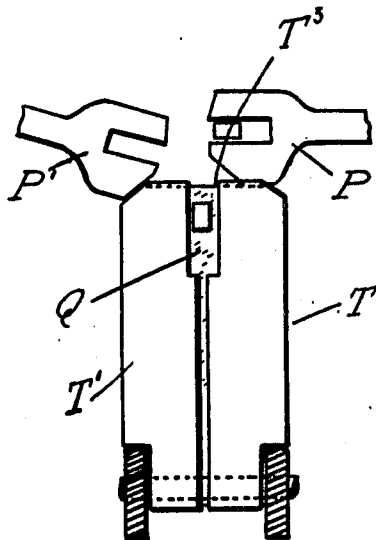
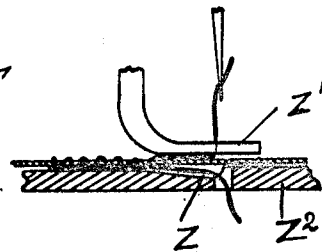


Fig. 11.



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UNITED STATES PATENT OFFICE.

GARRETT A. KINDER, OF DETROIT, MICHIGAN, ASSIGNOR TO AMERICAN LADY CORSET COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

SEWING-MACHINE.

1,061,383.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed October 9, 1909. Serial No. 521,913.

To all whom it may concern:

Be it known that I, GARRETT A. KINDER, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to sewing machines, and it is the primary object of the invention to provide means for instantaneously stopping the needle bar at any desired time during the continued operation of the feed mechanism.

The particular embodiment of my invention specifically illustrated is one in which the sewing machine is provided with an auxiliary needle bar, which may be stopped or set in motion at the will of the operator, for the purpose hereinafter described.

The invention consists—first—in the means for arresting and restarting the needle bar; second, in the means for relieving and restoring the tension upon the thread; third, in the peculiar construction, arrangement and combination of parts as hereinafter set forth.

In the drawings—Figure 1 is a sectional elevation of the sewing machine to which my improvement is applied; Fig. 2 is a cross section through the arm of the machine; Fig. 3 is an end elevation; Fig. 4 is a perspective view of the needle bar and operating mechanism therefor; Fig. 5 is a diagrammatic view of the rotary shuttle; Fig. 6 is an elevation thereof; Fig. 7 is a section showing the manner of engaging the thread; Fig. 8 is a plan of the work performed by the machine; Fig. 9 is a similar view showing a different part of the work; Fig. 10 is a rear elevation of part of the mechanism illustrated in Fig. 2; and Fig. 11 is an enlarged section of the work-feed.

My improvements are applicable to any of the standard constructions of the machine, but the construction illustrated is one of the type known as "rotary".

A is the head of the machine, B the arm thereof, and C the reciprocatory needle bar at the outer end of the arm operated by any suitable mechanism, such as the pitman D and crank E upon the shaft F.

G is the intermittently-operated needle bar, which is arranged parallel and adjacent

to the bar C and derives its motion therefrom.

Where the machine is used for simultaneously producing a double line of stitching, each of the needle bars D and G is provided with a needle and a thread-tension device, and a pair of shuttles are arranged in the base for coöperation therewith. If, however, the machine is used for a single line of stitching, the bar G only is provided with a needle.

It is essential to the success of the operation that the needle bar, when arrested in its movement, should be in the upper position when the needle is disengaged from the work. This necessitates mechanism for stopping the needle bar G, which is timed in relation to the movement of the latter, and is practically instantaneous in its operation. For this purpose, I have provided a coupler H for connecting the bar G to the bar C, which, as shown, consists of a pin projecting from the bar G and engageable by the rotation of said bar either with a notched bearing I in the needle bar C, or a notched keeper J, which will hold the bar from longitudinal movement.

K is a rock arm for rotating the bar G, having a splined engagement therewith and secured in the stationary bearing.

L is a rod for operating the rock arm K, which is controlled in its operation by mechanism of the following construction: M is a bar slidably secured in bearings on the arm B of the machine and connected to the rod L. N is a vibrating member which is actuated by the needle bar operating mechanism in timed relation to the movement of the latter. As shown, this member N is actuated by a cam O driven by bevel gear wheels O' from the shaft F, and the construction is preferably such that each phase of the reciprocation of the member N is simultaneous with the complete reciprocation of the needle bar C. P and P' are oppositely-arranged dogs pivotally secured to the bar M and movable into the path of a projecting lug N' on the reciprocatory member N. The arrangement of these dogs is such that when either one is moved into the path of the lug N' it will cause a movement of the bar M equal to the travel of the lug N', and this movement will occur in timed relation to the movement of the needle bar. Q is a rockable member for

alternatively supporting the dogs P P', so as to hold the same out of the path of the lug N'. This member Q is supported upon a bearing R on the frame, and is capable of being rocked by a connection S connected to the treadle or foot-actuated trip beneath the table of the machine. T and T' are rockable members cooperating with the member Q and pressed into contact therewith by light springs T². These members project slightly above the member Q, so as to form a shoulder T³. In the normal position of the parts, the rockable member Q is arranged in the plane of the dogs P P', and one of said dogs is resting thereon, and is thereby held out of the path of the lug N'. When, however, the member Q is rocked, it will withdraw its support from the dog, while the shoulder T³ will prevent the cooperating rockable member P, adjacent to said dog, from movement. Thus the dog will be permitted to drop downward into the path of the lug N', and the succeeding movement of said lug will actuate said dog and adjust the bar M to its opposite position of movement. The movement of the bar M is transmitted to the rod L, which rocks the arm K and rotates the needle bar G, so as to shift the position of the coupler pin H. Thus, if the needle bar is previously in operation, it will be stopped, or, if previously in a state of rest, it will be set into operation. The movement of the bar M—just described—will carry the opposed dog with it and over the cooperating rockable member T'. This member engages a cam face P² on said dog, so as to lift the latter into a position where it will be out of the path of the lug N', preventing the return movement of said lug from returning the bar M. All of the movements—just described—are so timed that, before the trip lever can be released to permit the rockable member Q to assume its normal position, the bar M and its dogs P P' have changed position, as has been described. When, however, the trip is released, the members Q, T and T' will be restored to their original positions, and the dog P upon the member T' will drop down the shoulder T³ and will rest upon the member Q, in which position the parts are all ready for another tripping operation.

From the description just given, it will be understood that each time the trip lever is actuated, it will cause a reversal in the position of the bar M, and that in one of these members the needle bar will be set into operation, while in the reverse adjustment the operation of the needle bar will be stopped. In each case, the operation occurs when the needle bar is at the upper end of its stroke, so that the needle is withdrawn from the work and permits the continued feeding of the latter. This will cause the drawing out

of both the upper and lower threads from their respective tension devices. For certain classes of work, the needle bar remains out of operation during a forward and return feed of the work, which necessitates the provision of some means for taking up the slack in the thread before the needle can again be thrown into effective operation. I have devised for this purpose an automatic take-up for the thread, of the following construction: U is a rod connecting the bar M with a bell crank lever U' at the outer end of the arm B of the machine. One of the arms of this bell crank lever engages the thread for the intermittently-operable needle at a point intermediate the tension V therefor and the needle. The arrangement is such that when the needle is in operation, the arm of the lever U' forms merely one of the guides for the thread, but, when the needle bar is stopped, this guide is simultaneously shifted in position, so as to furnish slack in the thread sufficient for the continued forward feeding of the work. After the return feeding of the work, the needle bar is again started simultaneously, the lever U' is shifted in position to take up the slack in the thread and place the proper tension on the thread for successful operation. The lower thread must also be provided with a take-up mechanism, and, as illustrated, this is applied to the rotary shuttle W. This consists of an arm W', having a limited oscillatory movement, and provided with a spring W² for yieldingly drawing it toward one limit of its movement. W³ is a thread-guide at the end of the arm W', over which the thread is drawn at a point intermediate the tension and the work. The tension is sufficient to overcome the spring W², so that during operation the arm W' will be at the opposite limit of its adjustment, but, whenever there is any slack in the thread to be taken up, the spring W² will automatically reverse the position of said arm W' and the guide W³ thereon. As has been stated, the tension of the spring W² is less than the main tension of the shuttle, but it is sufficient to cause the proper operation of the machine until the main tension is restored by the drawing back of the arm W' into its normal position.

The machine constructed as described may be used for various purposes, both with the single and the double needle bar. One use for the single bar machine is illustrated in Fig. 9, in which X is the cloth body of a corset, and X' indicates one of the steels in a pocket in said body. Where it is desired to stitch along the line X³, which is transverse to the steel X', the feeding movement of the work may be continued throughout the full line of stitching, while the needle bar may be drawn out of action whenever it comes into registration with one of the

steels X'; and may be maintained inoperative until the steel is passed.

In Fig. 8 is illustrated one use for the double needle bar machine, in which Y represents a cloth gore inserted in a body portion I' of the garment, and is secured thereto by parallel lines of stitching Y² Y³. Each of these lines extends in one direction along one side of the gore to the apex thereof, and then changes its direction to extend along the opposite side of the gore. In operation, both needle bars are maintained in action until the apex Y⁴ of the line Y³ is reached. At this point, the needle bar is stopped, while the work continues to feed onward until the stitching along the line Y² reaches the apex Y⁵. The operator then changes the direction of feed without interruption, and continues until the inactive needle bar again reaches said point Y⁴, at which instant the bar is again thrown into operation, and continues the stitching of the line Y³. During the inactive period of the needle bar, the thread is paid out, as has been previously described, and the lower thread is necessarily drawn along the upper face of the worktable beneath the work. To prevent binding of this thread, the plate Z beneath the presser foot Z' is slightly recessed at Z² to form a channel through which the lower thread may be drawn.

What I claim as my invention is:

1. In a sewing machine, the combination with a reciprocatory needle bar, of an auxiliary needle bar, a coupler arm on one of said bars normally engaging a keeper on the other bar, a rock arm feathered upon the arm-carrying bar for rotating the same to disengage said arm from the other bar, and mechanism timed with the reciprocation of the main bar for operating said rock arm.

2. In a sewing machine, a plurality of reciprocatory needle bars, means for operating one of said bars, and means for coupling another bar to said first mentioned bar by a rotation of one of said bars.

3. In a sewing machine, the combination of a reciprocatory needle bar, tension means for the thread of the needle, means timed in relation to the reciprocatory needle bar for arresting movement of said needle bar during the continued operation of the machine, and means for releasing the tension of the thread simultaneously with the arresting of the needle bar.

4. In a sewing machine, a plurality of reciprocatory needle bars, means for operating one of said bars, means for alternately connecting and disconnecting another bar to said first mentioned bar by the rotation of another of said bars, and means for arresting the movement of the bar disconnected.

5. In a sewing machine, a plurality of reciprocatory needle bars, means for operating

one of said bars, means operated in timed relation to said first mentioned means for alternately connecting and disconnecting another bar to said first mentioned bar at a predetermined point in the movement of said second mentioned bar by the rotation of one of said bars, and means for arresting the movement of the bar disconnected.

6. In a sewing machine, a plurality of reciprocatory needle bars, means for operating one of said bars, means for coupling another bar to said first mentioned bar by the rotation of one of said bars, a trip operable at any point in the travel of said bars for setting said coupling means into operation at a predetermined point in the travel of one of said bars.

7. In a sewing machine, a plurality of reciprocatory needle bars, means for reciprocating one of said bars, mechanism for alternately coupling another bar to said first mentioned bar and for arresting the movement of the second bar, and means for alternately operatively connecting said first mentioned means with and releasing the same from said mechanism for the purpose described.

8. In a sewing machine, a plurality of reciprocatory needle bars, means for reciprocating one of said bars, reciprocatory mechanism for alternately coupling another bar to said first mentioned bar and for arresting the movement of said second bar, and a connection between said reciprocatory mechanism and said means.

9. In a sewing machine, a plurality of reciprocatory needle bars, a rotary member, a connection between said rotary member and one of the bars for reciprocating the latter, mechanism for alternately coupling another bar to said first mentioned bar and for arresting the movement of the second bar, and means for actuating said mechanism adapted to be placed into and out of operative relation with said rotary member.

10. In a sewing machine, a plurality of reciprocatory needle bars, a rotary member, a connection between said rotary member and one of the bars for reciprocating the same, means for alternately coupling another bar to said first mentioned bar and for arresting movement of the second bar by the rocking of one of the bars, and means for rocking said last mentioned bar adapted to be placed into and out of operative relation to said rotary member.

11. In a sewing machine, a plurality of reciprocatory needle bars, a rotary member, a connection between said rotary member and one of the bars for reciprocating the same, means for alternately coupling another bar to said first mentioned bar and for arresting movement of the second bar by the rocking of one of the bars, and a reciprocatory member for rocking said bar.

12. In a sewing machine, a plurality of reciprocatory needle bars, a rotary shaft, a connection between the shaft and one of the bars for reciprocating the latter, a member
5 driven by said shaft, and means operated by said member for alternately connecting and disconnecting one of said bars with the first mentioned bar.

13. In a sewing machine, a plurality of reciprocatory needle bars, a rotatable shaft, a connection between the shaft and one of the bars for reciprocating the same, a member
10 driven by said shaft, a reciprocatory member for alternately connecting and disconnecting another of said bars with the first mentioned bar, and means for alternately
15 coupling said first mentioned member with and disconnecting the same from the reciprocatory member, a reciprocatory needle bar, mechanism for reciprocating said bar, tension means for the thread of the needle,
20 means for arresting the movement of the needle bar at a predetermined point in its path of movement, and means for relieving the tension means, simultaneously with the
25 arresting of the needle bar.

14. In a sewing machine, a reciprocatory needle bar, means for reciprocating said bar, tensioning means for the thread of the needle,
30 means for alternately arresting and reciprocating said needle bar during the continued operation of said means, and means for actuating said tension means to release

and restore the tension upon the thread simultaneously with the arresting and starting respectively of the needle bar. 35

15. In a sewing machine, a plurality of reciprocatory needle bars, a rotary member, a connection between said rotary member and one of said needle bars for reciprocating the same, reciprocatory means for alternately
40 connecting and disconnecting another bar with said first mentioned bar, means for releasing and placing a tension on the thread, reciprocatory mechanism for operating said tension means, a connection between said reciprocatory means, mechanism for operating the same simultaneously, and means for coupling and disconnecting said connection
45 with the rotary member. 50

16. In a sewing machine, a plurality of reciprocatory needle bars, means for reciprocating one of said needle bars, a reciprocatory member for alternately connecting and disconnecting another bar with said first
55 mentioned bar, and a connection between said reciprocatory member and said first mentioned means for alternately moving said member in opposite directions.

In testimony whereof I affix my signature 60 in presence of two witnesses.

GARRETT, A. KINDER.

Witnesses:

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HARRY W. GRAHAM.