Nov. 29, 1949 J. HEGGIE 2,489,489

SEWING MACHINE FOR STITCHING LEATHER CASES

Filed July 15, 1949 4 Sheets-Sheet 1

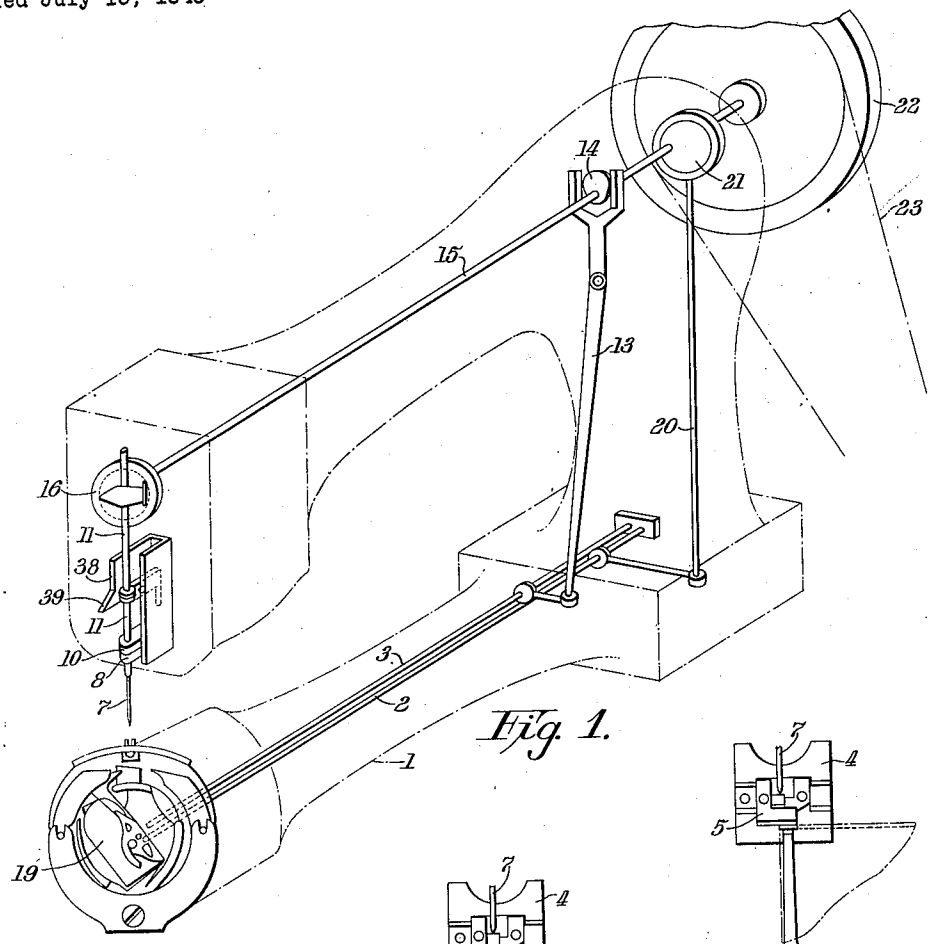


Fig. 1.

Fig. 10.

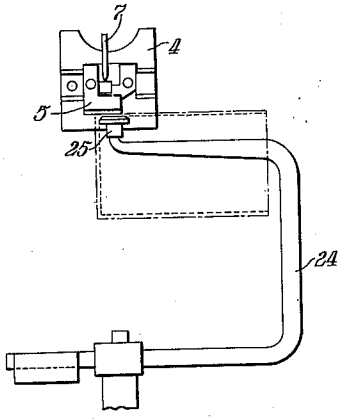


Fig 11.

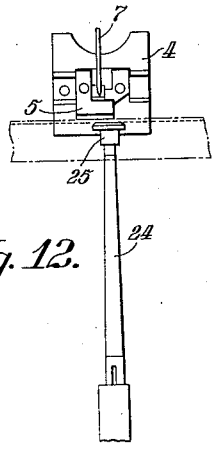


Fig. 12.

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Nov. 29, 1949 J. HEGGIE 2,489,489

SEWING MACHINE FOR STITCHING LEATHER CASES

Filed July 15, 1949 4 Sheets-Sheet 2

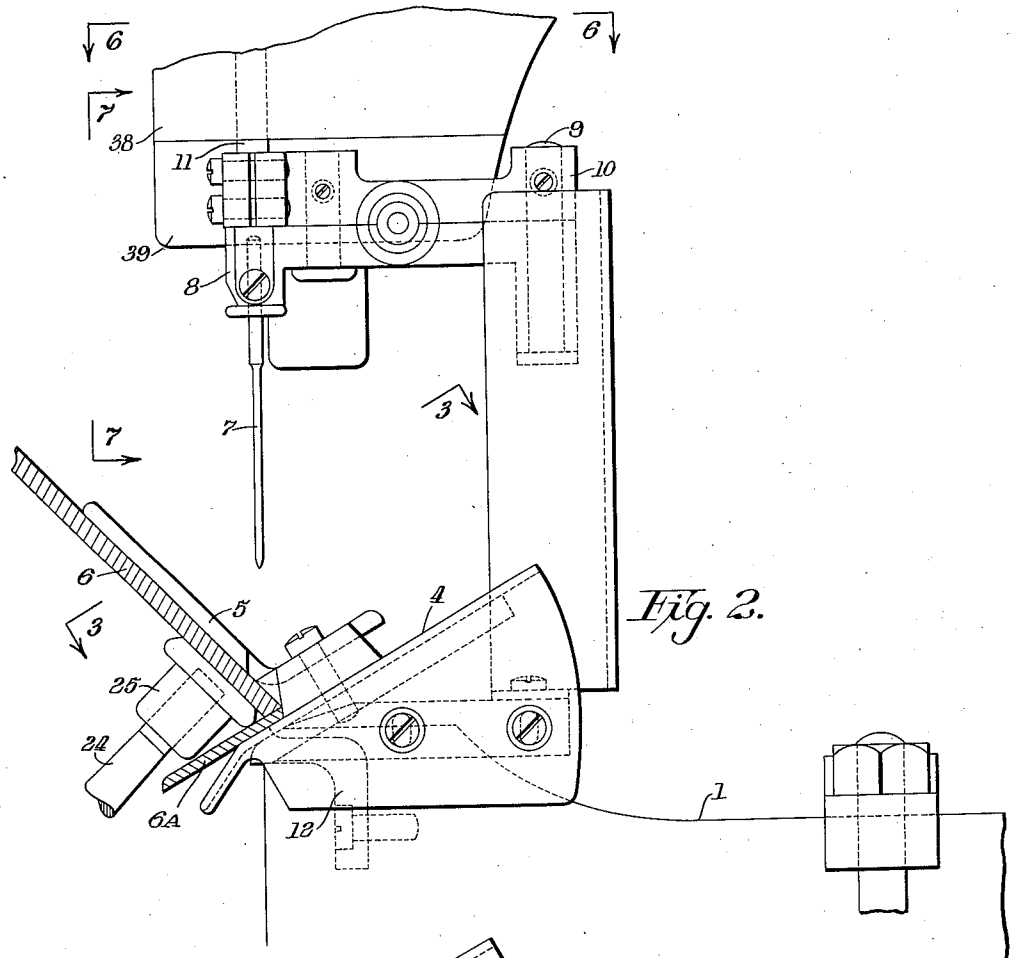


Fig. 2.

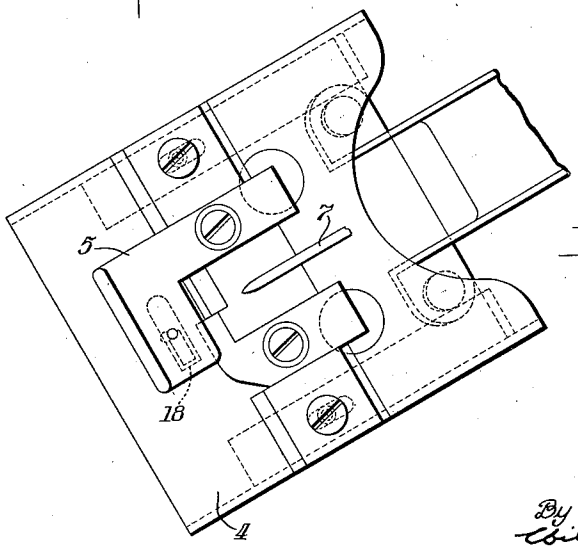


Fig. 3.

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SEWING MACHINE FOR STITCHING LEATHER CASES

Filed July 15, 1949 4 Sheets-Sheet 3

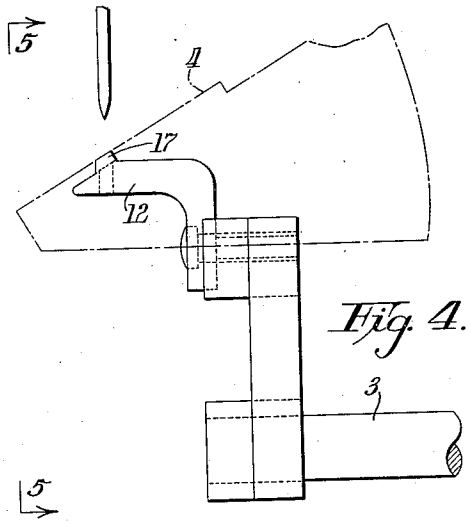


Fig. 4.

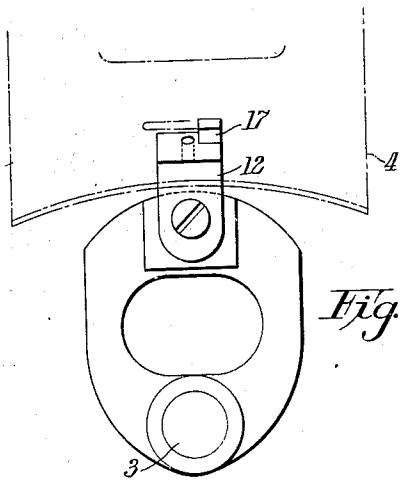


Fig. 5.

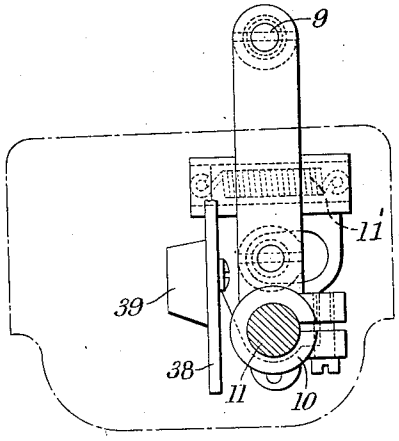


Fig. 6.

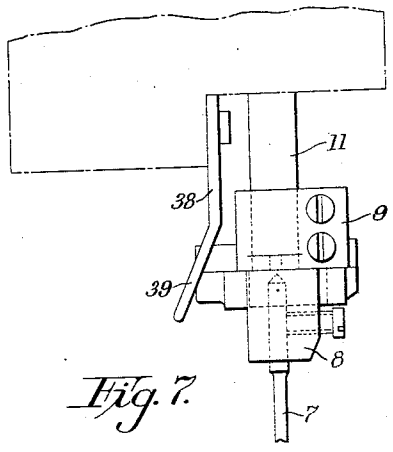


Fig. 7.

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SEWING MACHINE FOR STITCHING LEATHER CASES

Filed July 15, 1949 4 Sheets-Sheet 4

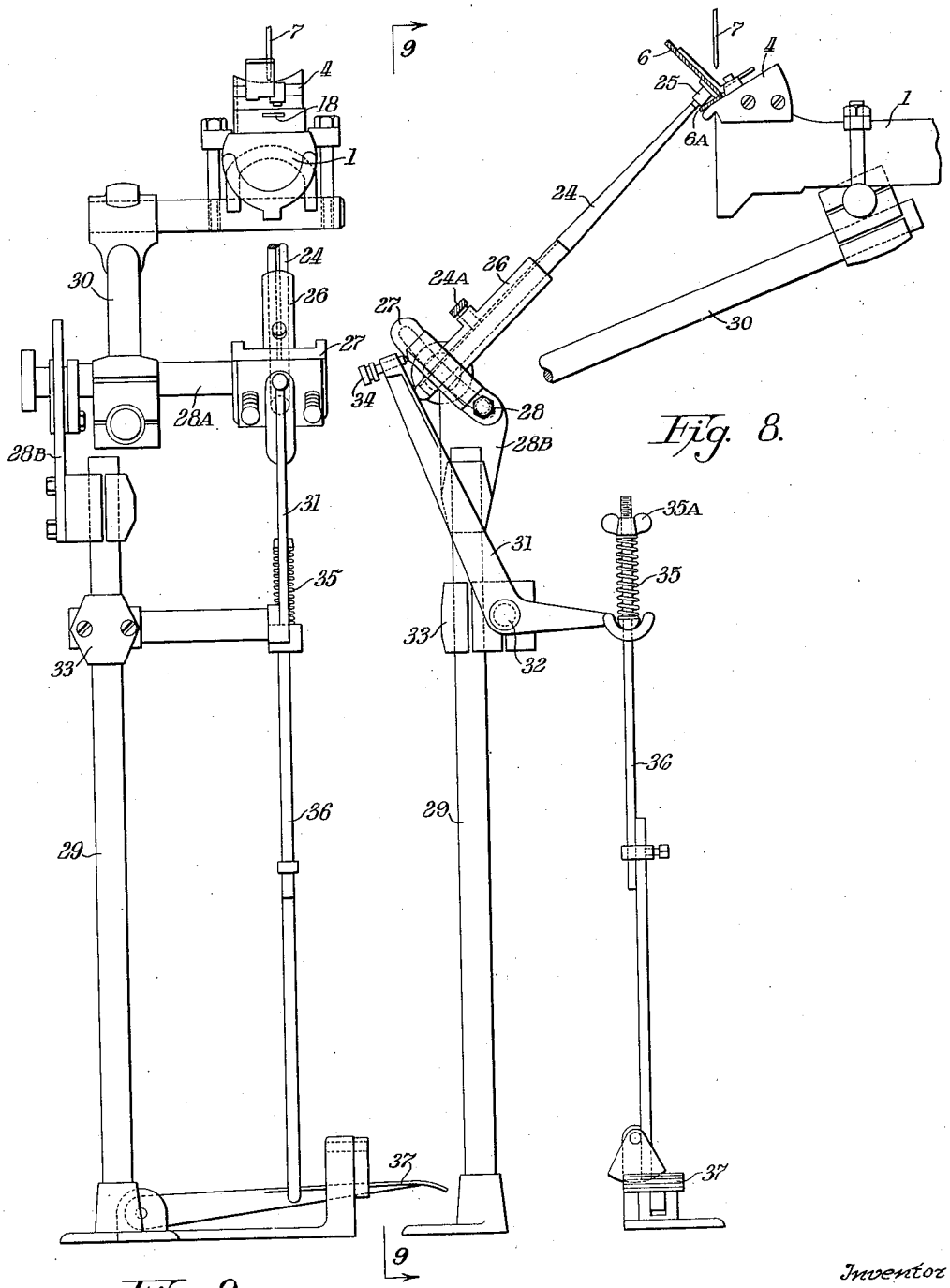


Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE

2,489,489

SEWING MACHINE FOR STITCHING LEATHER CASES

James Heggie, Clydebank, Scotland, assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application July 15, 1949, Serial No. 104,936
In Great Britain July 10, 1948

6 Claims. (Cl. 112—62)

1

This invention relates to a sewing machine for stitching diagonally through the marginal portions of sheets or strips forming the sides or panels of leather cases and the like along the line of contact of sheets or strips disposed approximately perpendicularly to one another.

A machine according to the invention is provided with a work-arm in which are mounted a shuttle-operating rock-shaft and a pusher-operating rock-shaft.

At the free end of the work-arm on the upper face thereof is mounted a throat plate disposed in an inclined plane transverse to the work-arm and carrying abutment members for leather or like sheets or strips held approximately perpendicular to one another, so that their abutting margins lie in the path of a vertically reciprocatory and laterally vibratory needle.

Lateral movement in one direction to feed the work is imparted to the needle by a reciprocatory pusher which is disposed within the work-arm with part of its upper face flush with the upper surface of the throat plate and which operates within a slot in the throat plate that also functions as a needle-throat.

The pusher is confined to reciprocatory movement transverse to the axis of the work-arm, its stroke being controlled by mechanism similar to the usual feed regulator mechanism.

The needle is fitted to a needle-holder free to move laterally relatively to the vertically reciprocatory needle-bar, the arrangement being such that, when the needle has penetrated the work, it is moved laterally by the pusher in opposition to a light spring acting on the needle-holder. After the needle has risen clear of the work, it is returned to initial position by the spring, or in the event of failure of the spring by a cam plate carried by the head of the machine bracket arm.

The machine is provided with exchangeable work-retainers suitable for use in stitching end opening cases and side opening cases, with provision for adjustment to suit the work.

The work-retainer is carried by a tubular support clamped to the work-arm of the sewing machine and projects from said support in a direction approximately parallel to, and above the free end of, the throat plate, stopping short of the needle-path.

The work-retainer may be in the form of a straight rod or in the form of a cranked rod fitted in a sleeve adjustable in a bracket adapted to be releasably clamped to a cross member of the tubular support. The rod is adjustable in the direction towards and away from the needle and has limited lateral freedom.

A practical embodiment of the invention is illustrated in the accompanying drawings in which Fig. 1 is a diagrammatic perspective view of the sewing machine showing the needle-bar and shuttle actuating mechanisms; Fig. 2 is a detail view to a larger scale showing in side elevation the throat plate and the needle-holder; Fig. 3 is a section through the line 3—3, Fig. 2, with the work-retainer removed; Fig. 4 is a side elevation of the pusher; Fig. 5 is a view on the line 5—5, Fig. 4; Fig. 6 is a section in the plane 6—6, Fig. 2; Fig. 7 is a view on the line 7—7, Fig. 2; Fig. 8 illustrates pedal-operated mechanism for influencing the work-retainer; Fig. 9 is a view on the line 9—9, Fig. 8; Figs. 10, 11 and 12 illustrate different styles of work-retainers to suit different classes of work.

2

Referring to the drawings, 1 denotes the work-arm of the sewing machine frame housing a shuttle-operating rock-shaft 2, and a pusher-operating rock-shaft 3, 4 denotes a throat plate removably mounted at the free end of the work-arm 1, to which throat plate are secured abutment members 5 for guiding leather or like strips 6 and 6A forming the work. 7 denotes an eye-pointed needle fitted in a needle-holder 8 pivoted at 9 to a support 10 fixed to a vertically reciprocatory needle-bar 11. 11' denotes a spring adapted to urge the needle-holder 8 to rotate about the pivot 9 in counterclockwise direction when viewed from above as in Fig. 6. 12 denotes a pusher connected to the pusher-operating rock-shaft 3, said shaft 3 being moved through part of a revolution in opposite directions alternately by the link mechanism 13 co-operating with a cam 14 fixed on a needle-bar actuating-shaft 15, said shaft 15 being coupled by cam and follower means 16 to the needle-bar 11. The pusher 12 is formed with a projection 17 located in a slot 18, which slot 18 functions as a needle-throat, the upper surface of the projection 17 being flush with the surface of the throat-plate 4. 19 denotes a shuttle operable by a driver on the shuttle-operating rock-shaft 2 which is in turn operatively connected by link mechanism 20 and eccentric means 21 to the needle-bar actuating-shaft 15. 22 denotes a balance wheel on the shaft 15. 23 denotes a driving belt. 24 denotes a work-retainer. 25 (Figs. 2, 8, 11 and 12) denotes a roller freely mounted on the upper end of the work-retainer 24. The work-retainer 24 is clamped by a grub screw 24A in a holder formed as a sleeve 26, said sleeve 26 being clamped to a slotted quadrant 27 pivoted at 28 to a bar 28A supported by a bracket 28B clamped to a supporting pillar 29. 30 denotes a stay bar connected to the bar 28A and supporting the work-arm 1. 31 denotes a bell-crank lever pivoted at 32 to a bracket 33 on the pillar 29, one arm of the bell-crank lever 31 being adapted to abut against the quadrant 27 through the medium of an adjustable screw 34, and the other arm of the lever 31 being connected through the medium of a spring 35 to the rod 36 coupled to

a pedal 37. 35A denotes a wing nut provided to facilitate altering the initial compressive force exerted by the spring 35. 38 denotes a cam plate fixed to the head of the machine and formed with an oblique surface 39 engageable with the needle-holder 8 in the elevated position of the needle-bar 11.

In practice, work comprising two strips 6 and 6A of leather, say, are so placed on the throat plate 4 that their margins abut, the strip 6 being against the abutments 5 and the strip 6A being against the throat plate 4. The pedal 37 is depressed, causing the bell crank lever 31 to move in clockwise direction, as seen in Fig. 3, the screw 34 coming against the quadrant 27 and urging said quadrant to move in clockwise direction about its pivot 28 and to move the upper end of the work-retainer 24 in the direction towards the junction of the strips 6 and 6A, the roller 25 pressing said strips 6 and 6A into the corner presented by the abutments 5 and the throat plate 4. The shaft 15 is rotated. The needle-bar 11 descends, carrying with it the support 10, the needle-holder 8 pivoted thereto, and the needle 7. The needle 7 passes through the strips 6 and 6A and through the slot 13 in the throat plate 4, carrying with it the upper thread. Continued rotation of the shaft 15 causes the pusher-operating rock-shaft 3 to move through part of a revolution by means of the cam 14 and the link 13, the attached pusher 12 moving towards, and coming against, the needle 7 while it is transfixing the strips 6 and 6A. Continued movement of the pusher tends to move the needle 7 laterally. As the needle 7 is held in the needle-holder 8, the needle-holder 8 swings about the pivot 9, the needle describing a small arc, the chord of which is equal in length to the length of one stitch. Further rotational movement of the shaft 15 causes the pusher 12 to move in reverse direction away from the needle and also commences to retract the needle, which leaves a loop of thread below the throat plate 4. Further rotational movement of the shaft 15 causes the shuttle to engage the needle thread loop in the usual manner in the formation of a lock-stitch. In the raised position of the needle the spring 11' swings the needle-holder 8 around the pivot 9 to its initial position. In the event of the spring failing to act, and the needle-holder remaining in the same angular position as it occupied after completion of the stitch just formed, the needle-bar 11, in rising to the top of its stroke, will cause the needle-holder 8 to come against the oblique face 39 of the cam 38 and to be forcibly moved to the initial position.

It will be seen that the feeding of the work is effected by the needle.

The inclination of the work-retainer 24 may be varied by moving the sleeve 26 along the slot in the quadrant 27. Also, the work-retainer 24 may be moved axially in the sleeve 26 by slackening the grub screw 24A, sliding the work-retainer 24 to the desired position and tightening the grub screw 24A.

It may be desirable so to adjust the amount by which the work-retainer 24 projects from the sleeve 26 that, when the pedal 37 is released, the work-retainer 24 is out of contact with the work. The spring 35 ensures that no matter with what force the pedal 37 is depressed the work-retainer 24 will not jam the work against the abutment 5 and the throat plate 4, which jamming action would prevent feeding of the work and cause the pusher 12 to break the needle. The initial compression of the spring 35 may be varied by adjustment of the wing nut 35A.

Fig. 10 illustrates the type of work-retainer most suitable for corner work. Fig. 11 illustrates a crank work-retainer suitable for use during the later stages of manufacturing a box such as an attaché case. Fig. 12 illustrates the type of pusher most convenient in sewing a straight run.

What is claimed is:

1. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm, said throat plate member presenting a slot and abutment means, a lower thread-handling device within said work-arm, a vertically reciprocatory and laterally movable needle adapted to penetrate said slot, a pusher engageable with said needle below said throat plate member and adapted to impart lateral movement to said needle in the direction transverse to the axis of said work-arm, a work-retainer adapted to urge the work against said abutment means, and a supporting structure clamped to said frame and carrying said work-retainer.

2. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm, said throat plate member presenting a slot and abutment means, a lower thread-handling device within said work-arm, a vertically reciprocatory needle-bar disposed above said throat plate member, a needle-holder fitted to said needle-bar and yieldable laterally relatively to said needle-bar, a needle carried by said needle-holder and adapted to penetrate said slot, a pusher engageable with said needle below said throat plate member and adapted to impart lateral movement to said needle and to said needle-holder in the direction transverse to the axis of said work-arm, a work-retainer adapted to urge the work against said abutment means, and a supporting structure clamped to said frame and carrying said work-retainer.

3. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm and formed with a slot, abutment means carried by said throat plate member, a shuttle operative within said work-arm, a vertically reciprocatory needle-bar disposed above said throat plate member, a needle-holder fitted to said needle-bar and yieldable laterally relatively to said needle-bar, a needle carried by said needle-holder and adapted to penetrate said slot, a pusher movable within said slot and engageable with said needle below said throat plate member whereby to impart lateral movement to said needle and to said needle-holder in the direction transverse to the axis of said work-arm, a work-retainer adapted to urge the work against said abutment means, and a supporting structure clamped to said frame and carrying said work-retainer.

4. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm and formed with a slot elongated in the direction transverse to the axis

of said work-arm, abutment means carried by said throat plate member, a shuttle operative within said work-arm, a vertically reciprocatory needle-bar disposed above said throat plate member, a needle-holder fitted to said needle-bar and yieldable laterally relatively to said needle-bar, a needle carried by said needle-holder and adapted to penetrate said slot, a reciprocatory pusher movable within said slot and engageable with said needle below said throat plate member whereby to impart lateral movement to said needle and to said needle-holder in the direction transverse to the axis of said work-arm, a work-retainer adapted to urge the work against said abutment means, a supporting structure clamped to said frame and carrying said work-retainer, and means for varying the inclination of said work-retainer.

5. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm and formed with a slot elongated in the direction transverse to the axis of said work-arm, abutment means carried by said throat plate member, a shuttle operative within said work-arm, a vertically reciprocatory needle-bar disposed above said throat plate member, a needle-holder fitted to said needle-bar and yieldable laterally relatively to said needle-bar, a needle carried by said needle-holder and movable through said slot, a reciprocatory pusher movable within said slot and engageable with said needle below said throat plate member whereby to impart lateral movement to said needle and to said needle-holder in the direction transverse to the axis of said work-arm, a work-retainer adapted to urge the work against said abutment means, a supporting structure clamped to said frame and carrying said work-retainer, and

means for moving said work-retainer relatively to said abutment means.

6. In a sewing machine for stitching leather cases and the like, the combination with a frame including a work-arm having a horizontal axis, an inclined throat plate member fitted to the free end of said work-arm and formed with a slot elongated in the direction transverse to the axis of said work-arm, abutment means carried by said throat plate member, a shuttle operative within said work-arm, a vertically reciprocatory needle-bar disposed above said throat plate member, a needle-holder fitted to said needle-bar and yieldable laterally relatively to said needle-bar, a needle carried by said needle-holder and movable through said slot, a reciprocatory pusher movable within said slot and engageable with said needle below said throat plate member whereby to impart lateral movement to said needle and to said needle-holder in the direction transverse to the axis of said work-arm, a spring urging said needle-holder in the direction opposed to that imparted by said pusher, a cam engageable with said needle-holder in an elevated position of said needle-bar, a work-retainer adapted to urge the work against said abutment means, and a supporting structure clamped to said frame and carrying said work-retainer.

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