Sept. 2, 1941. C. F. RUBEL 2,254,875

THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 1

FIG. I.

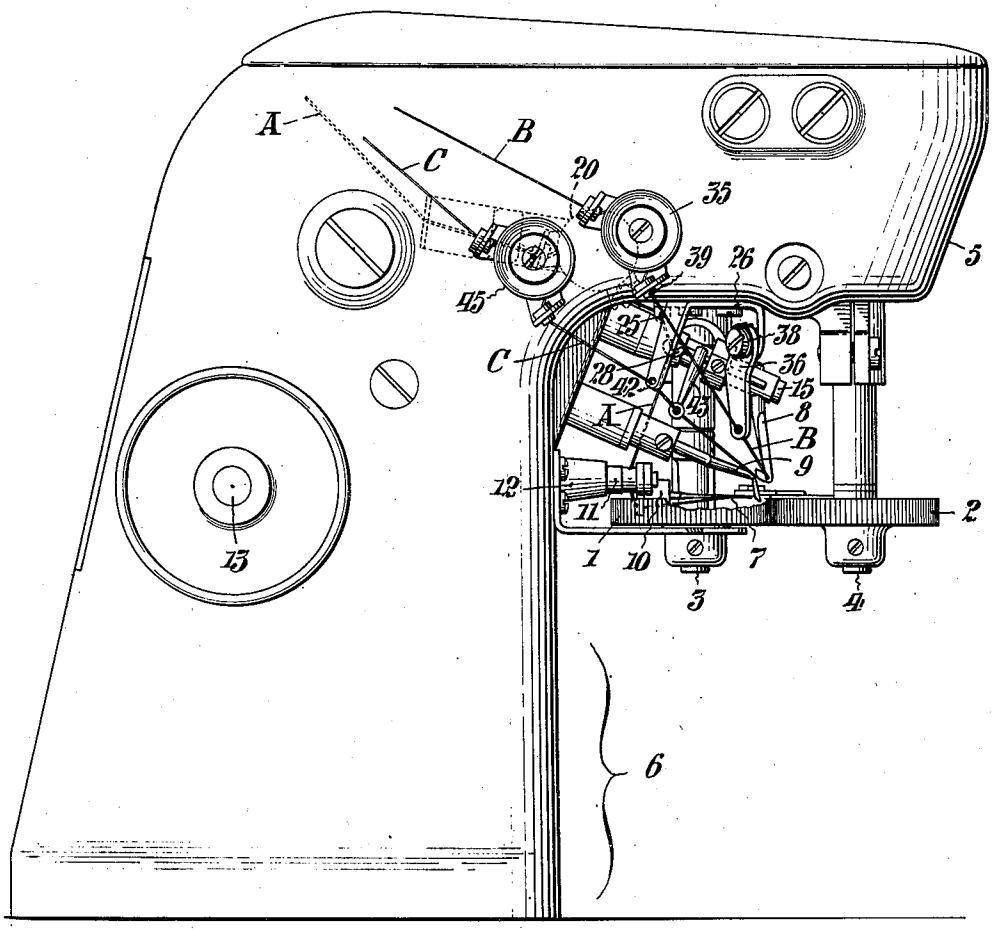
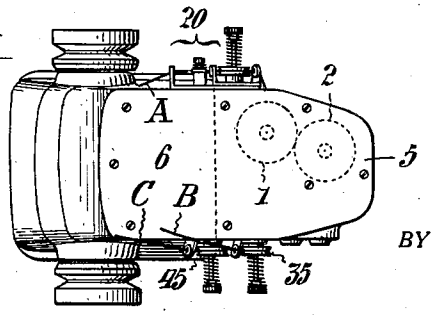


FIG. II.



BY

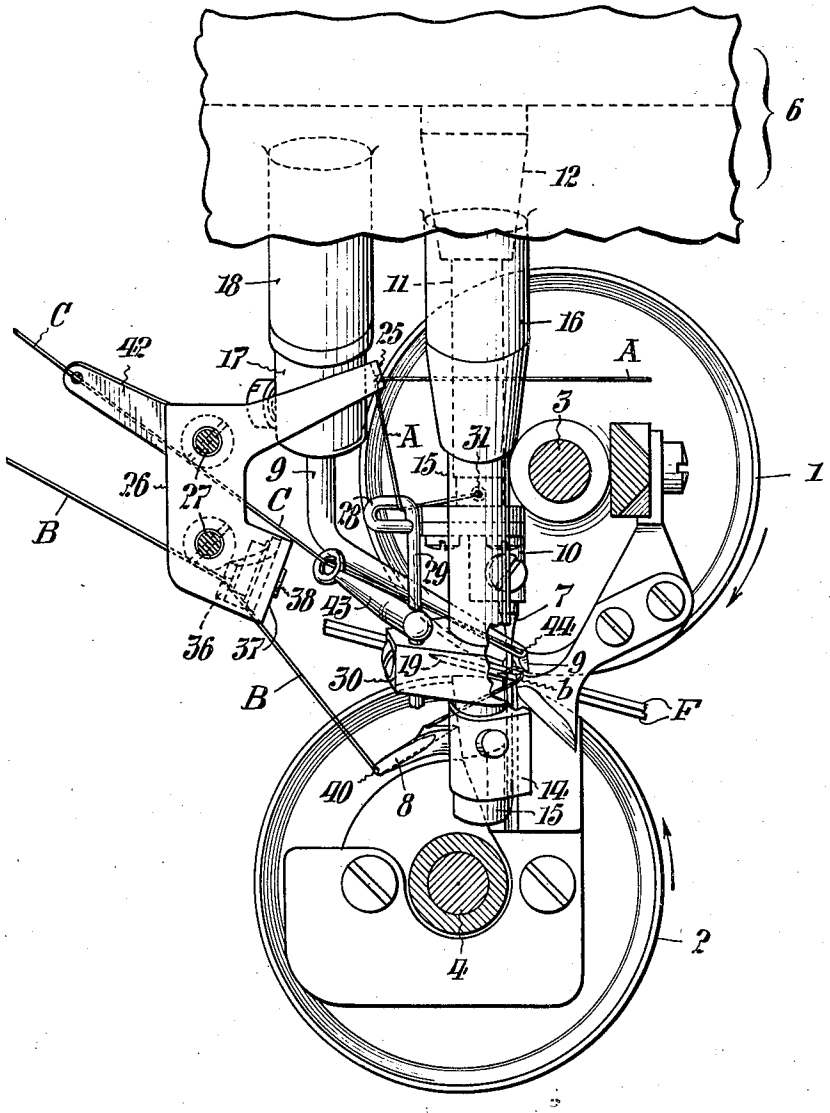
INVENTOR:
Charles F. Rubel,
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Sept. 2, 1941. C. F. RUBEL 2,254,875

THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 2

FIG. III.



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 3

FIG. X.

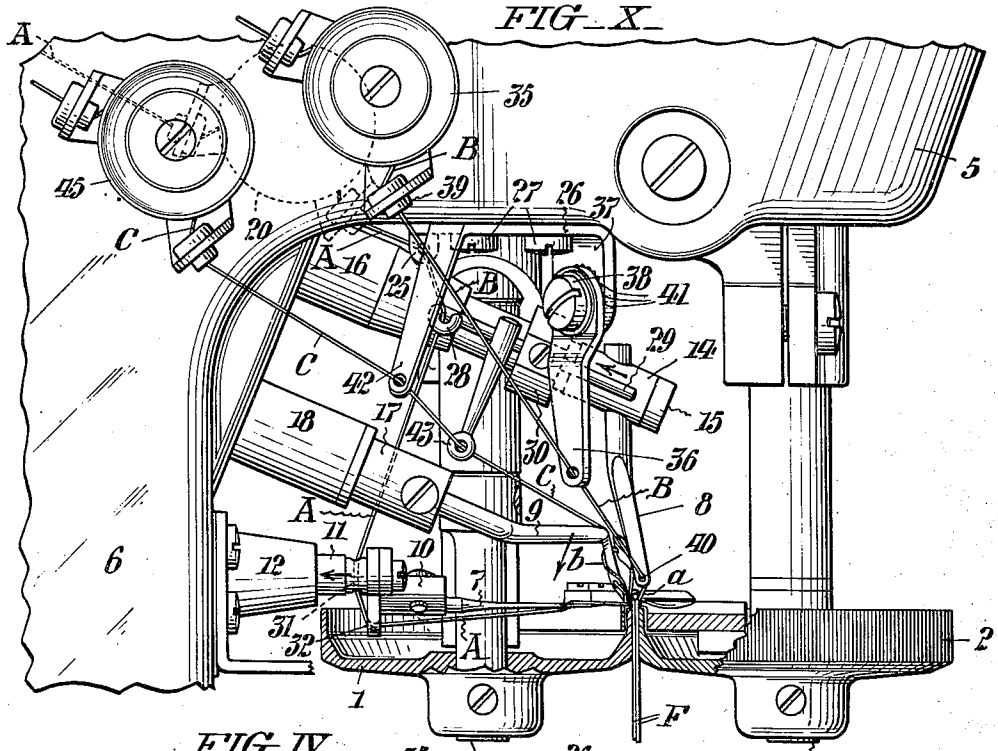
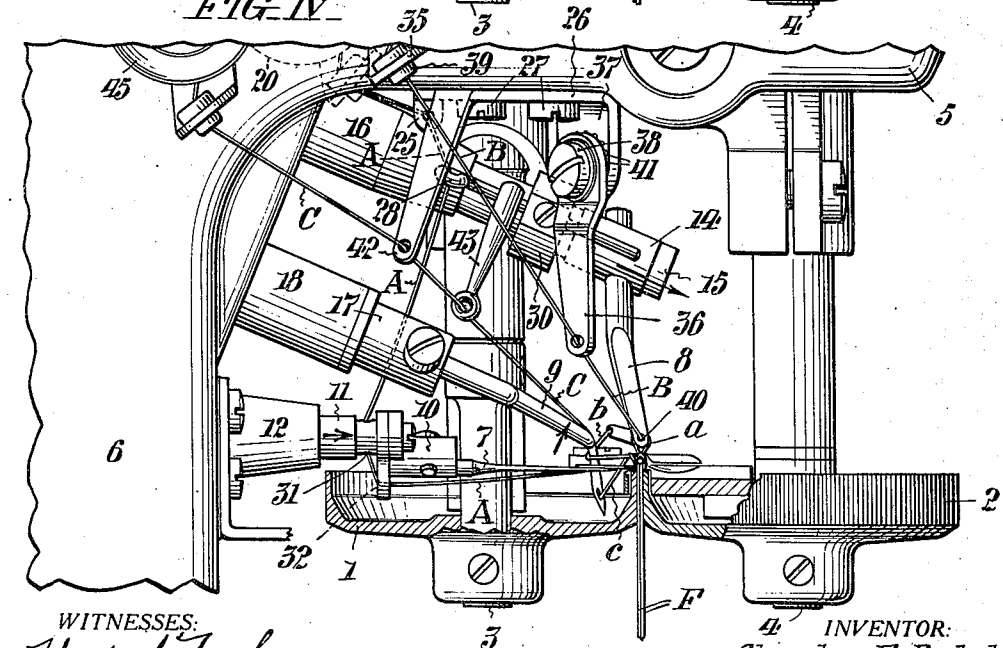


FIG. IV.



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 4

FIG. V.

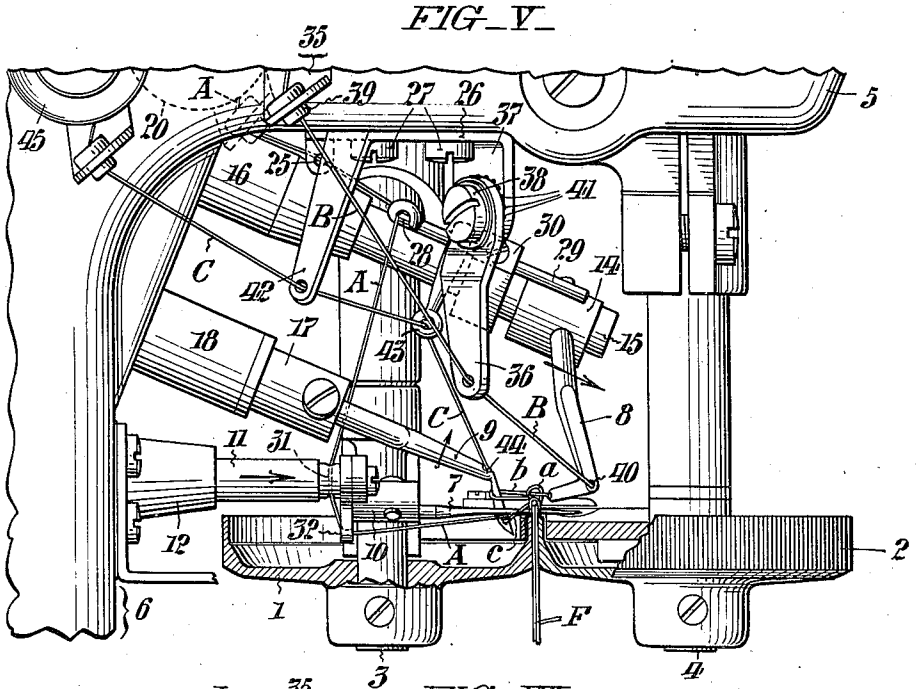
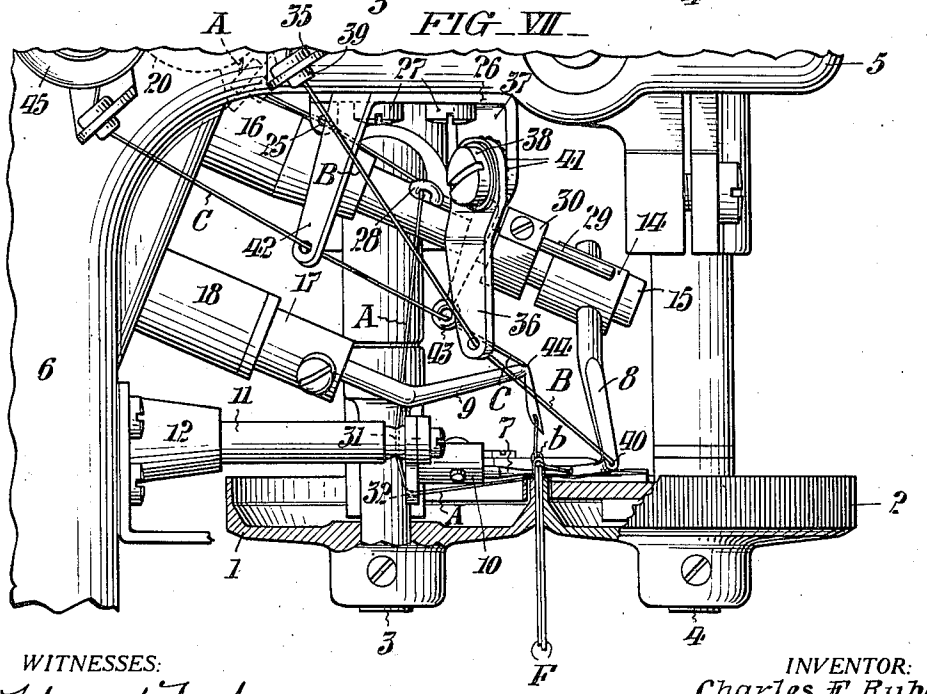


FIG. VII.



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 5

FIG. VI.

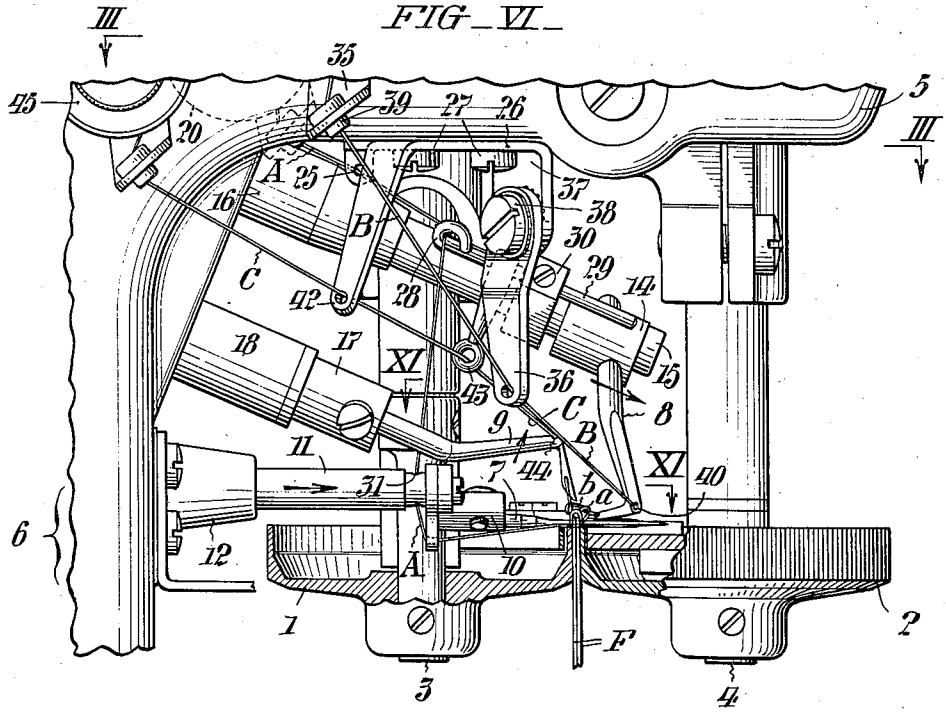
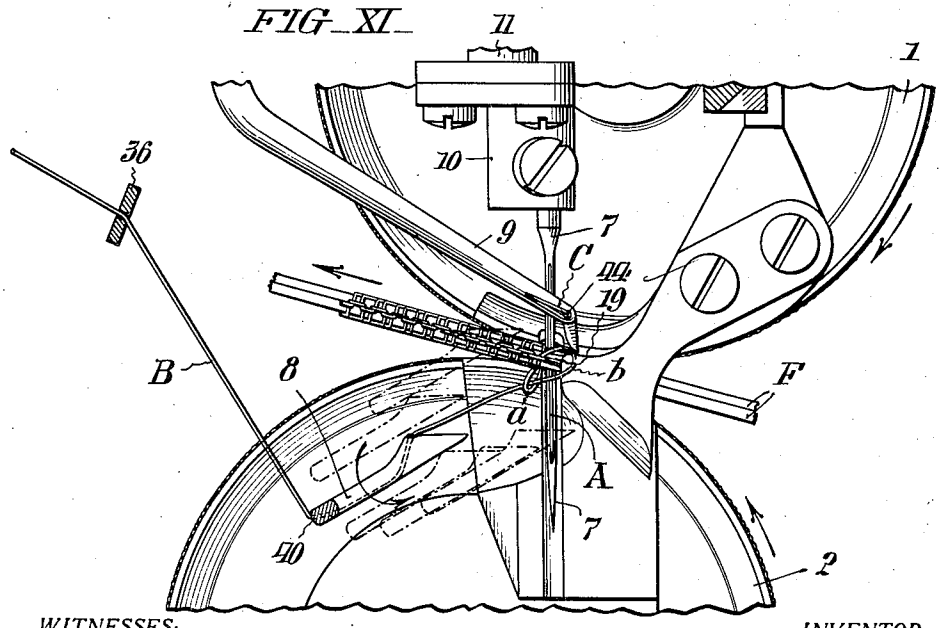


FIG. XI.



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 6

FIG. VIII

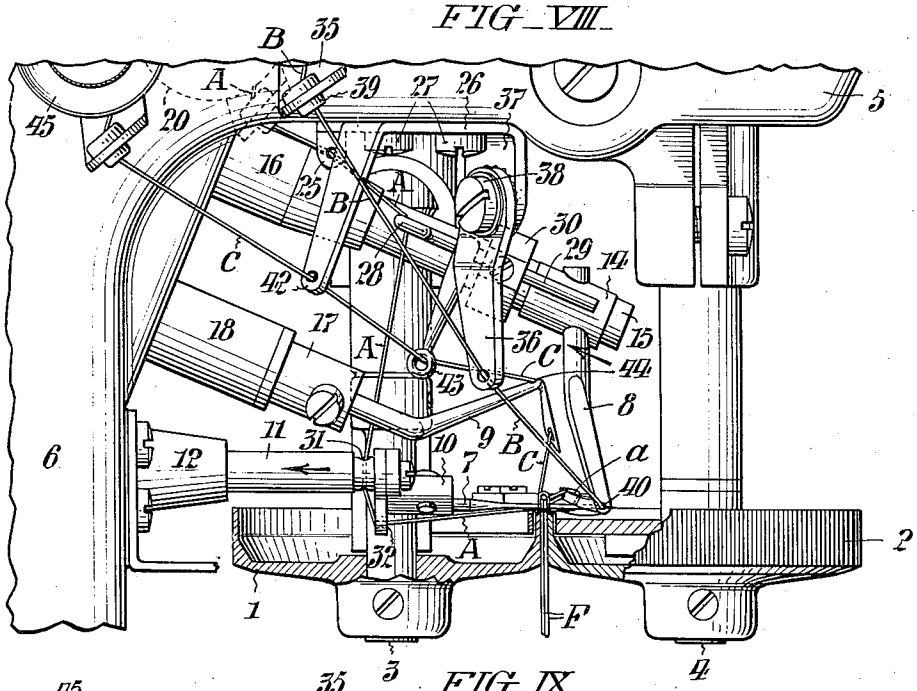
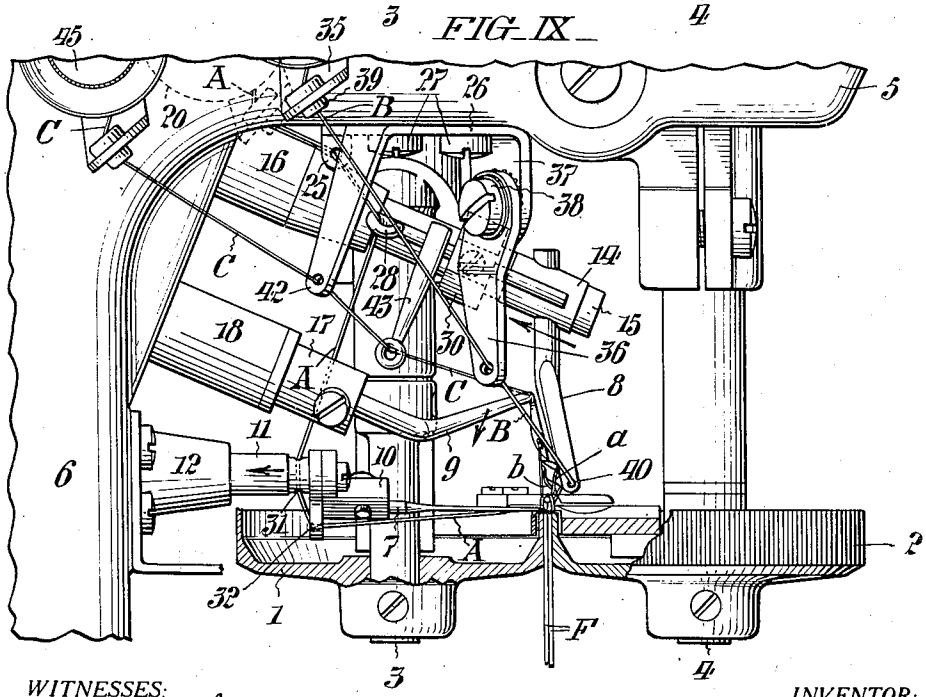


FIG. IX



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 7

FIG. XII

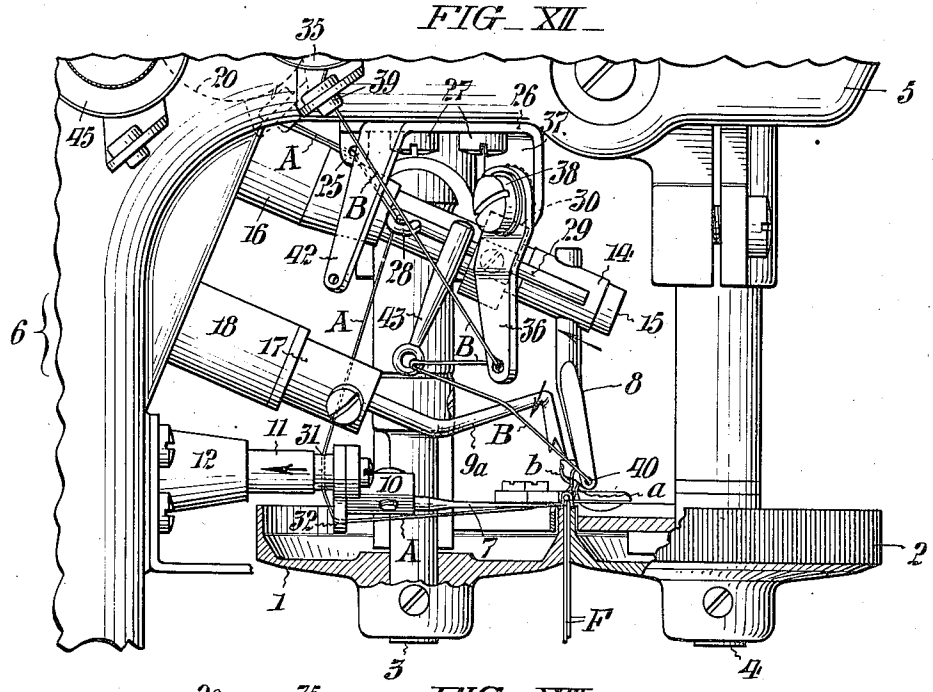
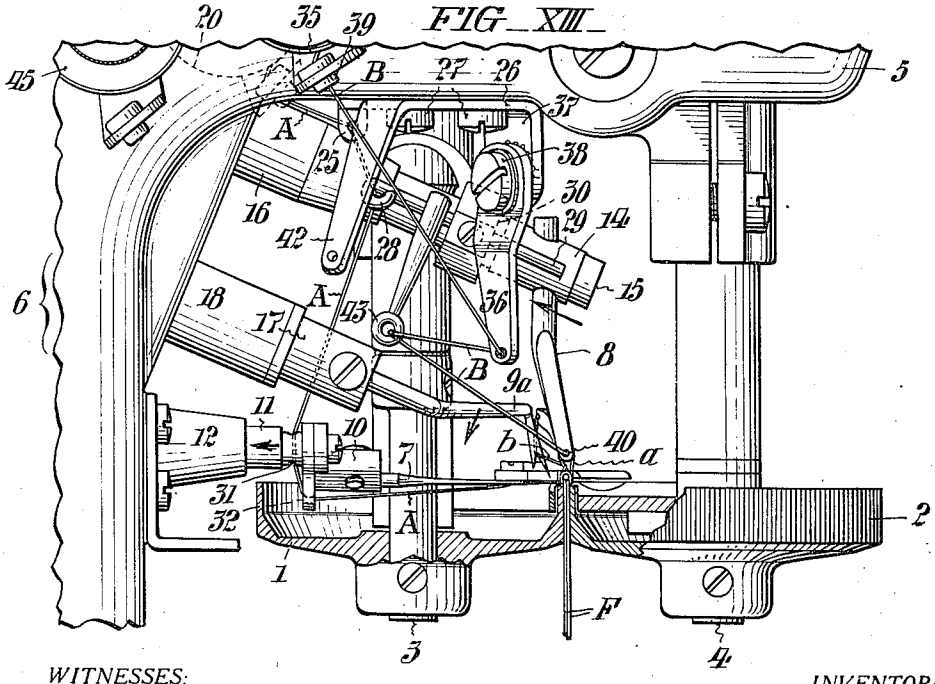


FIG. XIII



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 8

FIG. XIV

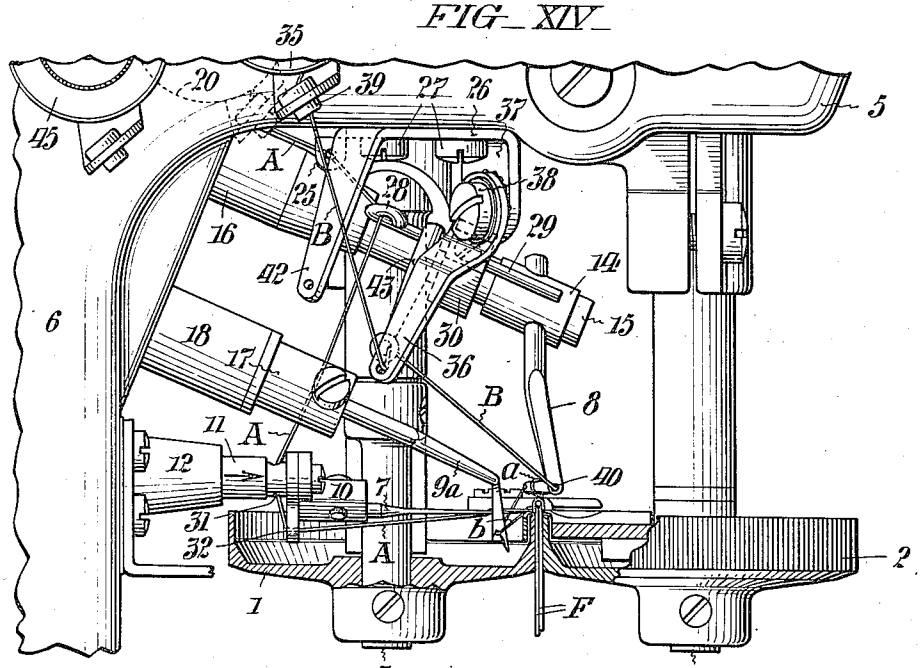
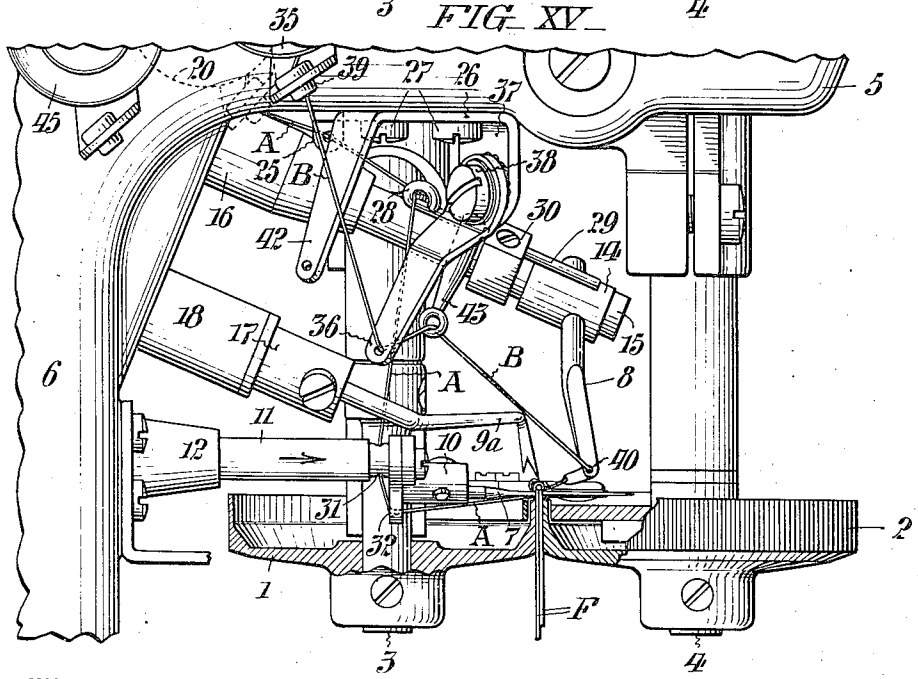


FIG. XV



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THREAD CONTROL MECHANISM FOR SEWING MACHINES

Filed July 16, 1938 9 Sheets-Sheet 9

FIG. XVI.

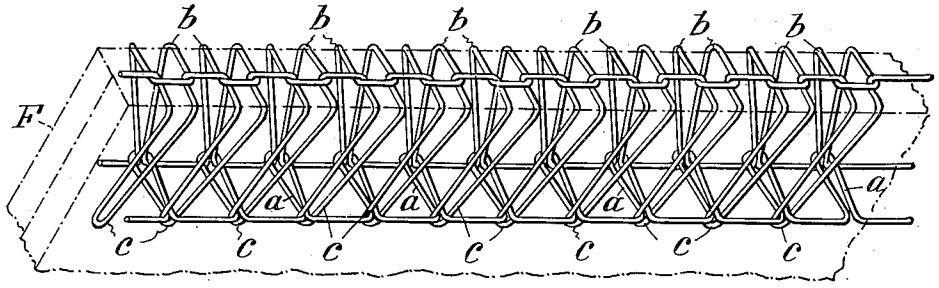


FIG. XVII.

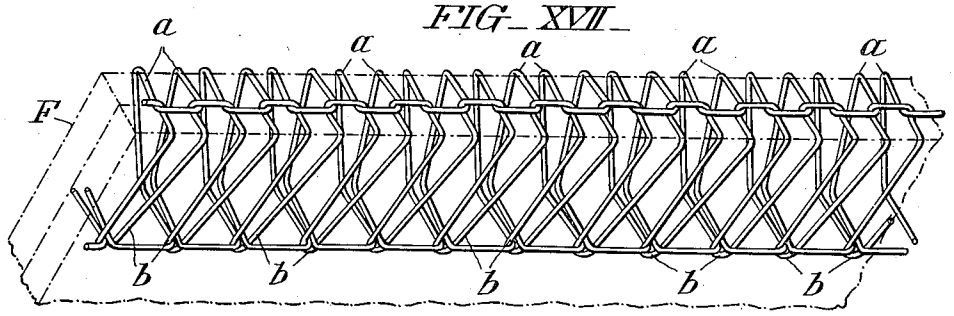
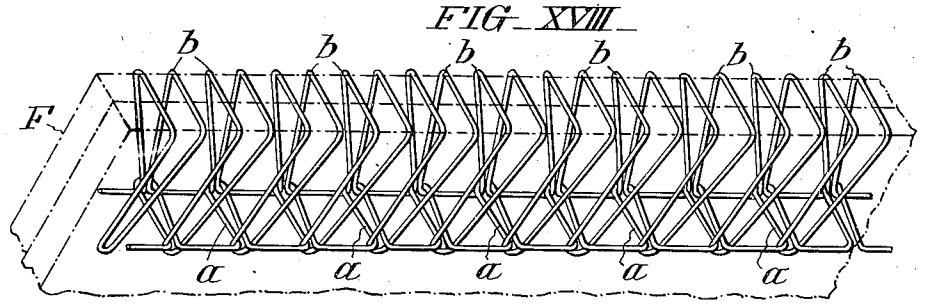


FIG. XVIII.



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Patented Sept. 2, 1941

2,254,875

UNITED STATES PATENT OFFICE

2,254,875

THREAD CONTROL MECHANISM FOR SEWING MACHINES

Charles F. Rubel, Chicago, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application July 16, 1938, Serial No. 219,611

19 Claims. (Cl. 112—16)

This invention relates to thread control mechanism for sewing machines, and it has reference more particularly to thread controls for sewing machines of the cup feed type such as are commonly used to over-edge seam stockings and the like. While the usual forms of thread controls are generally satisfactory for the threads of high count ordinarily employed in seaming relatively heavy or service weight stockings, their action is too severe upon the finer yarns required or desirable in the seaming of light-weight silk or chiffon stockings which are in vogue at the present time. The machines must therefore be run at slow speeds when fine yarns are used if frequent ruptures are to be avoided, with attendant decrease in production.

The chief aim of my invention is to overcome the above drawbacks, which objective I attain in practice as hereinafter more fully disclosed, through provision of control mechanism in which the threads are subjected to minimum working and abrasion, and in which the intermittent pull on them is gentle and protracted to such an extent during each stitch-forming cycle as to preclude rupturing and chafing, notwithstanding operation of the sewing machines at top speeds.

Another object of my invention is to provide a thread controlling mechanism having the above attributes which is arrangeable for the formation of both two and three thread overedge seams, as well as for the production of regular and of two thread tight needle loop seams.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein Fig. I is a view in side elevation of a cup feed sewing machine conveniently embodying the thread control mechanism of my invention, with the machine arranged to produce a three thread overedge seam.

Fig. II is a view drawn to a reduced scale showing the machine in top plan.

Fig. III is a fragmentary view in horizontal section on a larger scale taken as indicated by the arrows III—III in Fig. VI.

Figs. IV, V, VI, VII, VIII, IX and X are fragmentary views likewise on a larger scale corresponding to Fig. I, with portions broken out and sectioned to expose important details and showing the cooperating stitch-forming elements and the associated thread guiding elements in the successive relative positions which they occupy during a stitch-forming cycle.

Fig. XI is a fragmentary horizontal sectional view taken as indicated by the arrows XI—XI in Fig. VI.

Figs. XII and XIII show the machine arranged for the production of a regular two thread overedge seam.

Figs. XIV and XV are views showing the machine arranged for the production of a tight needle loop two thread overedge seam; and

Figs. XVI, XVII and XVIII are diagrammatic views in perspective showing the three types of seams which have been referred to.

The cup feed sewing machine herein illustrated for the purposes of exemplifying my invention is of the construction disclosed in U. S. Patent No. 2,043,711, granted to the present applicant and Anton Wyleta on June 9, 1936, with the additional features described and claimed in U. S. Patent #2,133,229 granted to applicant on Oct. 11, 1938. The tangentially opposing horizontal feed wheels or cups 1 and 2 by which the superposed edges of the work (fabric) F are intermittently progressed in the machine, are secured to the lower ends of vertical shafts 3 and 4 which depend from a laterally projecting portion 5 of the machine housing 6. Cooperating in Figs. I–IX to form a three-thread overedge seam as the work F is advanced between the cups are a thread carrying needle 7, a main thread-carrying looper 8 and an auxiliary thread-carrying looper 9. As shown, the needle 7 is clamped in a holder 10 at the end of a horizontal bar 11 which extends through a guide bearing 12 into the machine housing 6, the needle being thereby confined to endwise movement at a level directly above the top edges of the feed cups 1 and 2 and in a vertical plane passing substantially at right angles through the point of tangency of said cups, see Figs. III and XI. By suitable means (not illustrated) such as shown in Patent No. 2,043,711, supra, within the housing 6 and actuated from the pulley shaft 13 (Fig. I), the needle 7 is horizontally reciprocated within the limits shown in Figs. I and VIII, respectively, to penetrate the work F at right angles. The main looper 8 is of L configuration with its shank secured in a clamp holder 14 at the outer end of a shaft or rod 15 which extends at an acute angle to the horizontal upwardly into the housing 6 through a bearing 16 slightly to the left of the vertical plane of the needle 7, see Fig. III. By other means within the housing 6 (not illustrated) which may be like that shown in Patent No. 2,043,711 and likewise actuated from the pulley shaft 13, the rod or bar 15 is reciprocated endwise in the bearing 16 substantially in unison with the needle 7 to move the main looper within the limits respectively shown in Figs. I and VIII, and

at the same time oscillated about its axis to swing said looper crosswise of the needle between the limits shown in Figs. I and VIII. Successive positions of the horn of the main looper 8 in traveling through the orbit determined by the compound movement of the carrier bar 15, are shown in dot-and-dash lines in Fig. XI. The auxiliary looper 9 has the form of a crank arm with its shank axially secured in the end of another inclined rod or bar 17 which parallels the shaft 15 of the main looper 8, and which lies in a verticle plane considerably further to the left of the needle 7, see Fig. III. The bar 17 is confined to oscillation in a bearing 18, and by still other means (not illustrated) like that shown in Patent No. 2,043,711, within the housing 6, is in turn actuated from the pulley shaft 13 to swing the auxiliary looper 9 up and down within the limits respectively shown in Figs. V and VIII. The sewing threads manipulated by the needle 7, the primary looper 8 and the secondary looper 9 to form the seam stitches over the stationary stitch finger 19 (Figs. III and XI) of the machine are designated respectively by the characters A, B and C.

The mechanism which I have devised to control the threads in a cup feed sewing machine such as briefly described above includes an adjustable tension 20 located at the side of the machine remote from the observer in Fig. I, between the disks of which the needle thread A is passed en route from a suitable source of supply, not shown. In leaving the tension 20, the needle thread A passes crosswise beneath the overhang 5 of the machine housing to a pendant eye lug 25 on a guide bracket 26 affixed by screws 27 to the underside of said overhang, said eye being positioned somewhat inward of a transverse plane through the shaft 3 of the feed cup 1 and somewhat rearward (leftward in Fig. III) of the main looper bar 15. In its further travel, the needle thread A passes to an eye 28 at the inner end of a stem 29 paralleling the primary looper shaft 15, said stem constituting the controller for the thread A and being lengthwise as well as rotatively adjustable in a collar 30 affixed to said bar. Continuing from the guide eye 28, the needle thread A next passes downward through a vertical hole 31 in the needle bar 11 immediately behind the needle clamp 10, thence through a pendant eye 32 at the back of said clamp, and finally through the eye of the needle 7. It is to be particularly noted that the needle thread A is engaged by the controller 28 at a point intermediate the fixed eye 25 and the eye 31 in the needle bar 11.

The main looper thread B passes from a separate source of supply (not shown) to a regulatable disk tension 35 at the near side of the machine housing 6 in Fig. I, then to an eye at the end of an arm 36 which constitutes the controller for said thread and which is secured, with capacity for angular adjustment, to another pendant lug 37 of the guide plate 26 by a clamp screw 38. The lug 37 is so pitched that the controller 36 is positioned in a plane substantially at right angles to a straight line extending from the egress eye 39 of the disk tension 35 to the entrant end of the thread bore 40 of the main looper 8 at the heel of the latter to which the thread B passes after leaving the eye of said controller. The controller 36 is normally set in substantially vertically pendant position as shown in Figs. IV–X in which position it is held against accidental displacement through coaction between interlocking serrations 41 on the opposing surfaces of said arm and the lug 37 of the guide bracket 26, see Fig. IV. It is to be especially noted here also that the controller 36 engages the main looper thread B at a point intermediate the fixed eye 39 of the disk tension and the looper 8.

In leaving another separate supply source (not shown), the auxiliary looper thread C passes first through a regulatable disk tension 45, then to an eye at the end of a fixed pendant arm 42 on the guide plate 26, then to an eye at the end of a radial guide arm 43 which constitutes the controller for said thread and which is secured to the stem 29 carried by the primary looper shaft 15. Finally the thread C passes to the entrant end of the thread bore 44 of the auxiliary looper 9 at the heel of the latter. Here again it is to be observed that the thread C is engaged by the controller 43 at a point intermediate the fixed guide 42 and the auxiliary looper 9.

By virtue of being mounted on the main looper bar 15, it will be seen that orbital paths are determined for the needle thread and auxiliary thread controllers 28 and 43, the planes of the orbits being shiftable by adjustment of the stem 29 which carries said controllers.

The operation of the machine insofar as the functioning of its stitch-forming instrumentalities 7, 8 and 9 is concerned to determine production of a three thread overedge seam such as shown in Fig. XVI, is exactly like that of the machine of my copending U. S. Patent 2,133,229 of October 11, 1938, hereinbefore referred to. The main looper 8 is bodily advanced substantially in unison with the needle 7, and, due to the inclined path of its supporting bar, is moved downward into the feed cup 2 to the position so that its point is at the level of the needle when the latter is fully advanced as shown in Fig. VII. As the needle 7 begins to retract and throw up its loop *a*, the main looper 8 swings inward across the path of the needle and projects its own loop *b* through said needle loop as shown in Fig. IX. During further retraction of the needle 7, the main looper 8 is concurrently retracted bodily and lifts the needle loop *a* to a position over the edge of the work F and at the same time presents itself to the auxiliary looper 9, so that the latter, in swinging downward, will enter the loop *b* of said main looper as shown in Fig. IV. As the auxiliary looper 9 descends concurrently with further retraction of the needle 7 and the main looper 8, its loop *c* is distended downwardly through the main looper thread loop *b* as shown in Fig. IV, so that the needle will pass through said loop *c* on its next advance stroke. Later, when the needle 7 begins its advance, the main looper 8 is swung outwardly and withdrawn from the needle loop *a*, and the secondary looper 9 swung upwardly and withdrawn from the main looper loop *b* as shown in Fig. VII, with completion of a stitch-forming cycle.

The manner in which my new thread control mechanism functions during each stitch-forming cycle is as follows:

During rearward movement of the needle 7 from the time its point leaves the work F (Fig. IX) until it reaches the inner limit of its retractive stroke, substantially as shown in Fig. IV, the previously formed needle thread loop is pulled tight while held on the main looper 8 and a new supply of thread is drawn from a spool (not shown) for the succeeding needle loop. This thread drawing action is due to angular deflec-

tion of the needle thread A caused by the movable controller 28 as the needle bar 11 recedes. Entry of the main looper 8 into a new needle loop as shown in Fig. VIII causes the previous needle loop to be drawn up tight. During advance of the main looper bar 15 concurrently with the needle bar 11 through the positions shown in Figs. IV–VII the controller 28 moves upwardly along the needle thread A as said main looper bar swings rearward out of the needle thread loop. The needle thread A is thus maintained under definite control without being subjected to increased tension or chafing by the controller 28.

During its outward swing and withdrawal from the needle loop *a*, the main looper 8 pulls a definite amount of the yarn B from a suitable source of supply (not shown) for the next main looper loop, while the preceding main looper loop is held by the secondary looper as shown in Figs. IV and V. This drawing action is due in part to the position of the adjustable controller 43 intermediate the fixed guide 26 and the main looper 8, and in part to the fact that the main looper bar 15 is being advanced at this time. The action just described takes place when the machine is arranged to make a two thread stitch as in Fig. XV. During the succeeding inward swing of the main looper 8 to enter the needle loop (Figs. VIII, IX and X) the point of said looper moves idly along the thread B without inducing additional strain in it, so that it is maintained substantially taut and under perfect control.

The auxiliary looper 9 draws yarn C from another suitable source of supply (not shown) sufficient for one shank of the preceding auxiliary looper loop as it nears the end of its downward swing (Figs. X and IV), and again as it nears the end of its upward swing (Figs. VII and VIII) to provide the necessary amount of yarn for the other shank of said auxiliary looper loop. During the intermediate portion of its swing the auxiliary looper 9 moves idly along the thread C likewise without inducing additional strain in said thread so that the latter is in turn effectively maintained under control by the moving controller 43 on the bar 15 of the main looper 8.

By adjusting the stem 29 lengthwise and rotatively on the main looper bar 15, the above described functioning may be determined to a nicety. Since the main looper bar 15 has but four motions (back and forth, endwise, and to and fro swinging movement or oscillation) the needle and auxiliary looper threads A and C are taken up and given up only once during each stitch forming cycle through orbital movement induced in the controllers 28 and 43 by said main looper bar.

The machine may be adapted to form a regular two thread overedge seam such as shown in Fig. XVII by removing the auxiliary looper 9 from its carrier bar 17 and substituting a fish tail spreader such as shown at 9*a* in Figs. XII and XIII, and by passing the looper thread B through the controller 43 after it leaves the fixed controller 36 and before it enters the thread channel 40 in the looper 8. As the needle 7 retracts after having been thrust through the work, its loop *a* is thrown up and taken by the looper 8 which is being swung inward and at the same time bodily retracted and positioned over the point of stitch formation to present its thread B to the spreader 9*a* as shown in Fig. XII. As the spreader 9*a* descends (Fig. XIII) it draws off a supply of thread B for a looper loop *b* and depresses the loop for passage of the needle 7 therethrough on its next forward stroke. The needle loop *a* which is still on the looper 8 at this time is distended at its lower side (Fig. XIII) under the pull induced in the looper thread B by the spreader 9*a* with the result that more needle thread A is drawn from its supply than can be taken up completely on the next forward stroke of the needle. As a consequence of this coaction between the looper 8 and the spreader 9*a*, needle and looper loops *a*, *b* of substantially the same size are formed with said loops interengaging centrally of the edge of the work as shown in Fig. XVII. Since both the looper 8 and the controller 43 are secured to the looper bar 15 they swing in unison with respect to the fixed controller 36 positioned between them and move back and forth on the thread B without inducing strain or pull thereon, but keeping it sufficiently taut and under definite control during the stitch forming cycle. The previously formed looper loop is drawn up during each stitch forming cycle by the action of the spreader 9*a* upon the looper thread B, the extent of such tightening being dependent upon the amount of needle thread A pulled off in the formation of the previous stitch in the manner above explained.

To produce a two thread seam such as shown in Fig. XVIII with tight needle stitches *a*, the only change required in the set-up of the machine is to adjust the controller 36 to the angular position shown in Figs. XIV and XV. As a result of this changed position of the controller 36, the looper 8 during its movement from the time that it releases the preceding needle loop until it is about to enter into a new needle loop, draws off a surplus of the thread B from the supply. Therefore when the spreader 9*a* subsequently acts upon the looper thread B in descending, no pull is induced in the latter to strain or enlarge the needle loop. The needle loop is thus drawn up tight in the work with the looper loop *b* extending completely around the edge of the work F as in Fig. XVIII. Due to the changed position of the controller 36 in Figs. XIV and XV, the course of the thread B from the source of supply to the looper is more direct, i. e., less angular and devious than in Figs. XII and XIII, to permit freer receiving of the thread in the guides so that the supply for the looper loop can be more easily drawn off by the looper as explained. This drawing action occurs only however during the outward swing of the looper 8, the latter, in swinging inward, moving idly on the thread exactly as was the case in the formation of the three thread seam, while the controller 43 moving in unison therewith and relative to the fixed controller 36 maintains said yarn under definite control.

Having thus described my invention, I claim:

1. In an overedge sewing machine having a pair of tangentially opposing wheels between which the superposed multiple edges of the work being seamed are advanced, a reciprocating thread-carrying needle adapted to penetrate the several thicknesses of the work at right angles subtsantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle in forming the overedge seam; thread controlling mechanism including a fixed eye through which the needle thread passes enroute from a source of supply to the needle; and an orbitally moving needle

thread controller operative in the interval between the fixed eye and the needle to maintain the needle thread under definite control throughout the stitch-forming cycle.

2. In an overedge sewing machine having a pair of horizontally-arranged tangentially opposing wheels between which the superposed multiple edges of the work being seamed are progressed, a horizontal endwise reciprocating thread-carrying needle adapted to penetrate the several thicknesses of the work at right angles substantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle to form the overedge seam; thread controlling mechanism including a fixed guide above the path of the needle through which the needle thread passes enroute from a source of supply to the needle, and a needle thread controller movable both in the direction of the needle and crosswise thereof in the interval between the fixed guide and the needle to maintain the needle thread under definite control throughout the stitch-forming cycle.

3. In an overedge sewing machine having a pair of horizontally arranged tangentially opposing wheels between which the edge of the work being seamed is progressed, a horizontal endwise-reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle to form the overedge seam; thread controlling mechanism including a fixed guide positioned at an elevation above the path of the needle, through which the needle thread passes enroute from a source of supply to the needle, and a needle thread controller movable both in the direction of the needle and crosswise thereof, in the interval between the fixed guide and the needle to maintain the needle thread under definite control throughout the stitch-forming cycle, said guide being so positioned with respect to the path of travel of the needle as to determine draw off of needle thread from the supply for a succeeding needle loop only during the retracting stroke of the needle.

4. In an overedge sewing machine having a pair of horizontally-arranged tangentially opposing wheels between which the edge of the work being seamed is progressed, a horizontal endwise reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle to form the overedge seam, said looper having movement both in the direction of the needle and crosswise thereof; thread controlling mechanism including a fixed guide positioned above the path of the needle, and a needle thread controller moved in unison with the looper in the interval between the fixed guide and the needle to definitely control the needle thread throughout the stitch-forming cycle.

5. In an overedge sewing machine having a pair of horizontally-arranged tangentially opposing wheels between which the edge of the work being seamed is progressed, a horizontal endwise reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle to form the overedge seam, said looper having movement both in the direction of the needle and crosswise thereof; thread controlling mechanism including a fixed guide above the path of the needle, and a needle thread controller having compound movement corresponding to that of the looper in the interval between the fixed guide and the needle to definitely control the needle thread throughout the stitch-forming cycle, the path of movement of said controller being such as to determine draw off of the needle thread for the needle loop from the supply only during the retractive stroke of the needle.

6. In an overedge sewing machine having a pair of horizontally-arranged tangentially opposing wheels between which the edge of the work being seamed is progressed, a horizontal endwise reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, a four motion thread-carrying looper cooperating with the needle in forming the overedge seam, an inclined carrier bar for the looper lying substantially in the vertical plane of the needle bar above the latter and having both endwise and oscillating motion; thread-controlling mechanism including a fixed guide eye above the looper bar through which the needle thread passes enroute from a source of supply to the needle, and a needle thread controller mounted on the looper bar for movement therewith in the interval between the fixed eye and the needle to definitely control the needle thread at all times during the stitch-forming cycle.

7. In an overedge sewing machine having a pair of horizontally-arranged tangentially opposing wheels between which the edge of the work being seamed is progressed, a horizontal endwise reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, a four motion thread-carrying looper cooperating with the needle in forming the overedge seam, an inclined carrier bar for the looper lying substantially in the vertical plane of the needle bar above the latter and having both endwise and oscillating motion; thread-controlling mechanism including a fixed guide eye above the looper bar through which the needle thread passes enroute from a source of supply to the needle, and a needle thread controller mounted on the looper bar for movement therewith in the interval between the fixed eye and the needle to definitely control the needle thread throughout the stitch-forming cycle, said controller being so positioned on the looper bar as to determine drawing of needle thread from the supply for a succeeding needle loop only during the retroactive stroke of the needle.

8. In an overedge sewing machine having a pair of tangentially opposing wheels between which the edge of the work being seamed is advanced, a reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, and a four motion thread-carrying looper cooperating with the needle in forming the overedge seam; thread controlling mechanism including a fixed guide through which the looper thread passes enroute from a source of supply to the looper, and a looper thread controller in the interval between the fixed guide and the looper to definitely control the looper thread throughout the stitch-forming cycle, and a member supporting the controller with capacity for adjustment crosswise of the path of the looper thread in the interval aforesaid.

9. In an overedge sewing machine having a pair of tangentially opposing feed wheels between

which the edge of the work being seamed is progressed, a reciprocating thread-carrying needle adapted to penetrate the work at right angles substantially at the point of tangency of the wheels, a main four motion thread-carrying looper adapted to penetrate the needle loops, and a two motion auxiliary thread-carrying looper adapted to penetrate the loops of the main looper for penetration of its own loop by the needle; thread-controlling mechanism including a fixed guide through which the auxiliary looper thread passes enroute from a source of supply to the auxiliary looper, and a moving auxiliary looper thread controller in the interval between the fixed guide and the auxiliary looper to definitely control the auxiliary looper thread throughout the stitch-forming cycle.

10. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a plurality of thread-carrying instrumentalities which cooperate to form an overedge seam with multiple concatinated loops along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to the instrumentalities, adjustable controllers respectively in intervals between the fixed guides and certain of the instrumentalities, and orbitally moving controllers respectively in intervals between other fixed guides and others of the instrumentalities to definitely control said threads independently throughout the stitch-forming cycle.

11. In an overedge sewing machine having a pair of tangentially opposed wheels between which the work to be seamed is advanced, a reciprocating thread carrying needle for penetrating the work at right angles substantially at the point of tangency of the wheels, a main four motion thread carrying looper for penetrating the needle loops, and an auxiliary two motion thread carrying looper movable through the loop of the looper in presenting its own loop to the needle; thread controlling mechanism including fixed guides through which separate threads pass respectively enroute from separate sources of supply to the needle and the loopers, an adjustable controller for the main looper thread intermediate the fixed guide for the latter and the main looper, and moving controllers operative on the needle thread and the auxiliary looper thread in the intervals between the corresponding fixed guides and the needle and auxiliary looper respectively to definitely control said needle and auxiliary looper threads independently throughout the stitch-forming cycle.

12. In an overedge sewing machine having a pair of tangentially opposed wheels between which the work being seamed is advanced, a reciprocating thread carrying needle for penetrating the work at right angles substantially at the point of tangency of the wheels, a main four motion thread carrying looper adapted to penetrate the needle loops, and a two motion auxiliary thread carrying looper movable through the loop of the main looper in presenting its own loop to the needle; thread controlling mechanism including fixed guides through which separate threads pass respectively from different sources of supply to the needle and the loopers, an adjustable take-up for controlling the main looper thread intermediate the supply for the latter and the main looper, and controllers mounted on and movable with the main looper to independently control the needle and the auxiliary looper threads in the intervals respectively between the corresponding fixed guides and said needle and said auxiliary looper throughout the stitch-forming cycle.

13. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and a pair of synchronously moving controllers in the intervals between the fixed guides and the respective instrumentalities to definitely control said threads independently throughout the stitch-forming cycle.

14. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and a pair of controllers having orbital movement in the intervals between the fixed guides and the respective instrumentalities to definitely control said threads independently throughout the stitch-forming cycle.

15. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and a pair of controllers mounted on one of said instrumentalities and movable therewith to definitely control the threads independently in the intervals between the fixed guides and guides on said instrumentalities throughout the stitch-forming cycle.

16. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and a pair of synchronously moving controllers in the intervals between the fixed guides and the respective instrumentalities to definitely control said threads independently throughout the stitch-forming cycle, the controller for one of said threads being adjustable to regulate the tightness of the seam loops formed by the other instrumentality.

17. In an overedge sewing machine having a pair of tangentially opposed wheels between which the work to be seamed is advanced, a reciprocating thread carrying needle for penetrating the work at right angles substantially at the

point of tangency of the wheels, a main four motion thread carrying looper for penetrating the needle loops, and an auxiliary two motion thread carrying looper movable through the loop of the looper in presenting its own loop to the needle; thread controlling mechanism including fixed guides through which separate threads pass respectively enroute from separate sources of supply to the needle and the loopers, a controller for the main looper thread intermediate the fixed guide for the latter and the main looper, and moving controllers operative on the needle thread and the auxiliary looper thread in the intervals between the corresponding fixed guides and the needle and auxiliary looper respectively to definitely control said needle and auxiliary looper threads throughout the stitch-forming cycle.

18. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and separate moving control means in the intervals between the fixed guides and the instrumentalities to definitely and individually control said threads throughout the stitch-forming cycle.

19. In an overedge sewing machine having a pair of tangentially opposed wheels between which the edge of the work being seamed is advanced, and a pair of thread carrying instrumentalities which cooperate to form an overedge seam along the advancing edge of the work; thread controlling mechanism including fixed guides through which the threads for the respective instrumentalities pass enroute from separate sources of supply to said instrumentalities, and separate control means mounted on one of said instrumentalities and movable therewith to definitely and individually control the threads in the intervals between the fixed guides and guides on said instrumentalities throughout the stitch-forming cycle.

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