May 9, 1939. J. P. WEIS 2,157,373

THREAD HANDLING DEVICE FOR SEWING MACHINES

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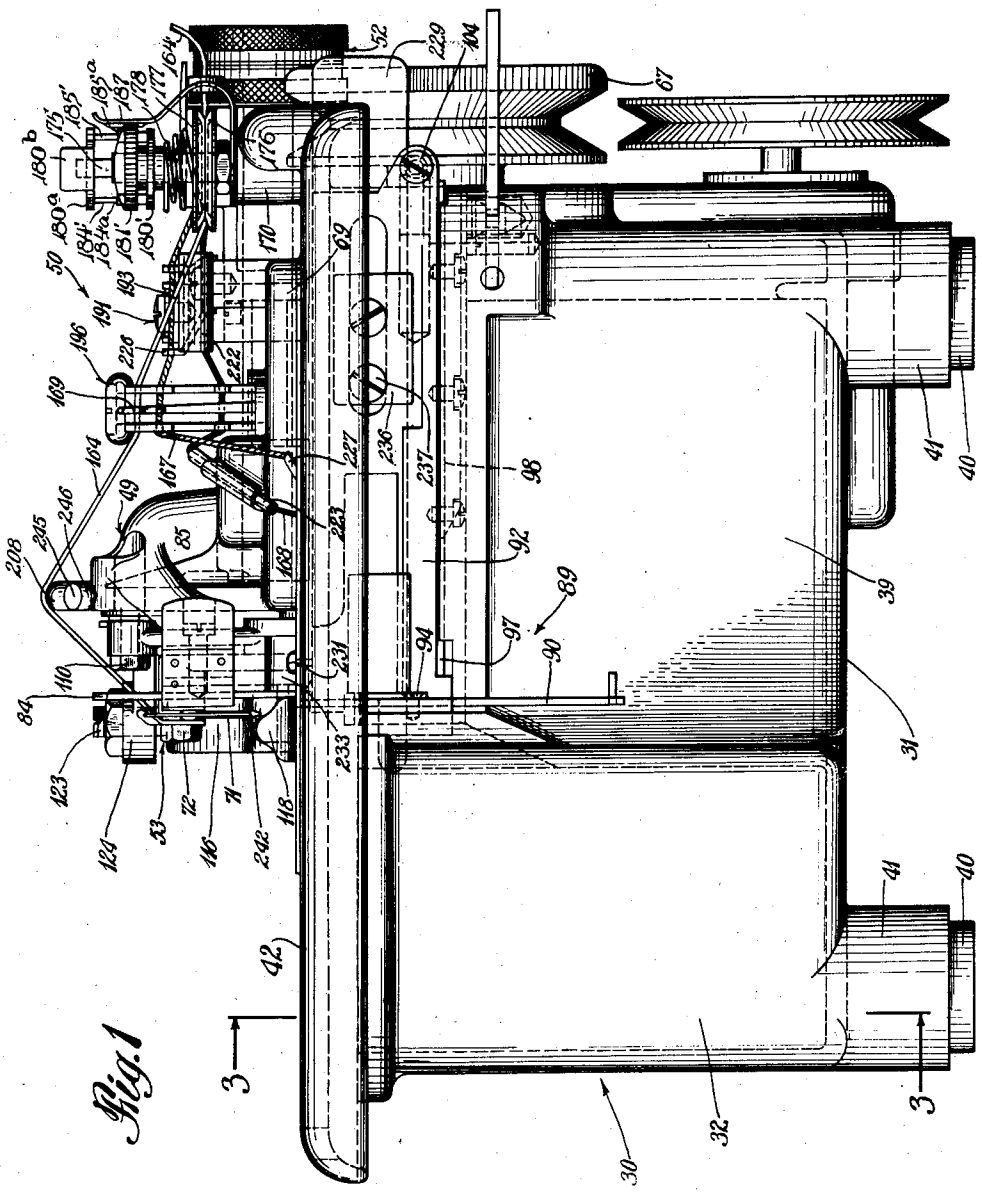


Fig. 1

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May 9, 1939. J. P. WEIS 2,157,373

THREAD HANDLING DEVICE FOR SEWING MACHINES

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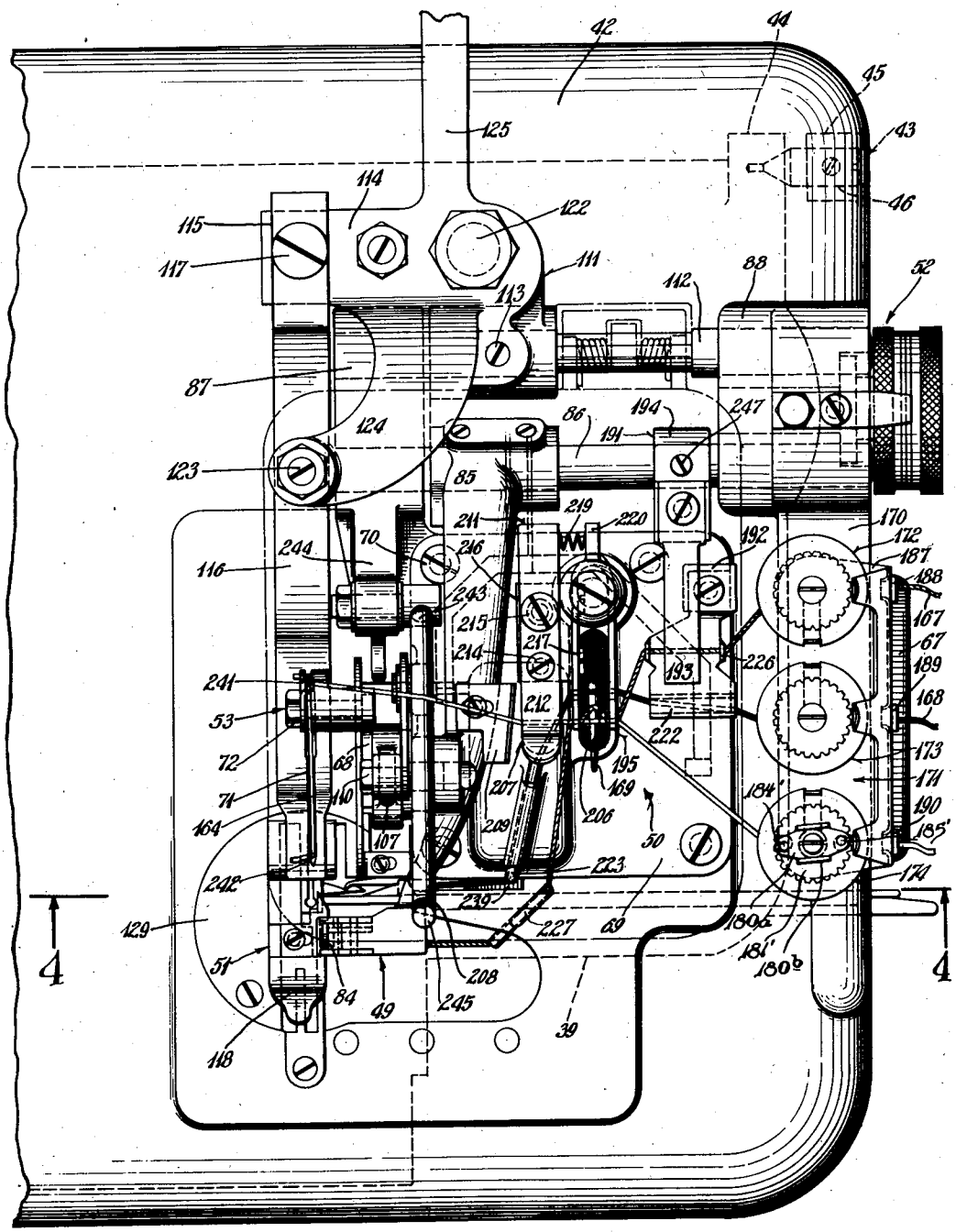


Fig. 2.

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THREAD HANDLING DEVICE FOR SEWING MACHINES

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Fig. 3

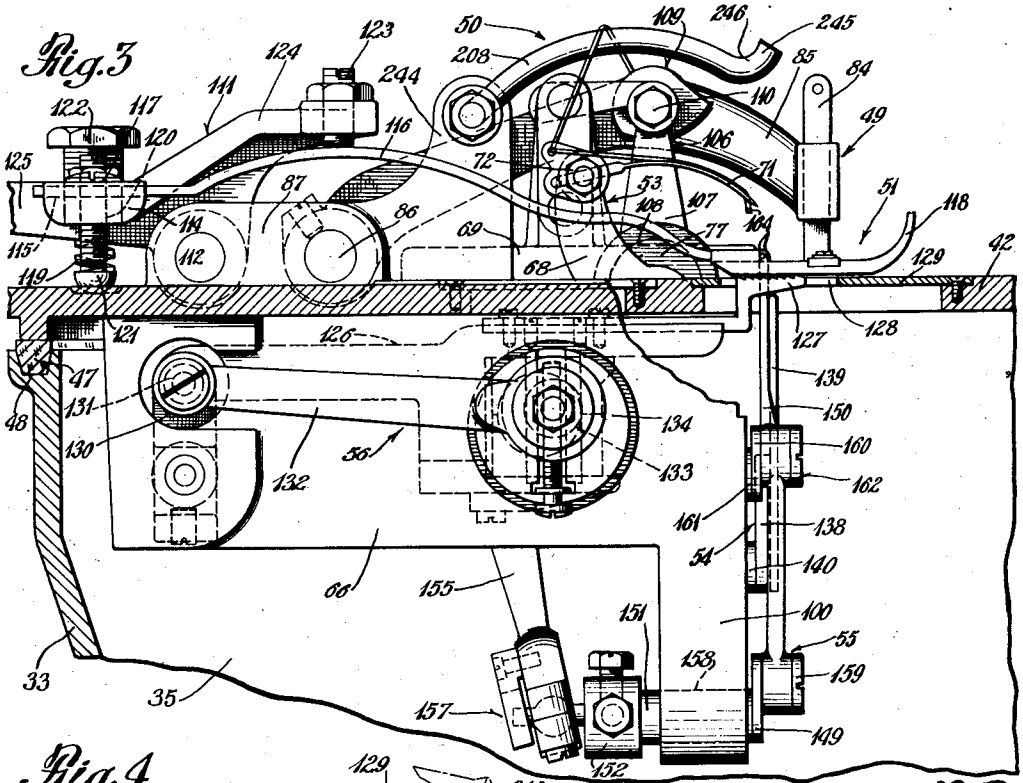
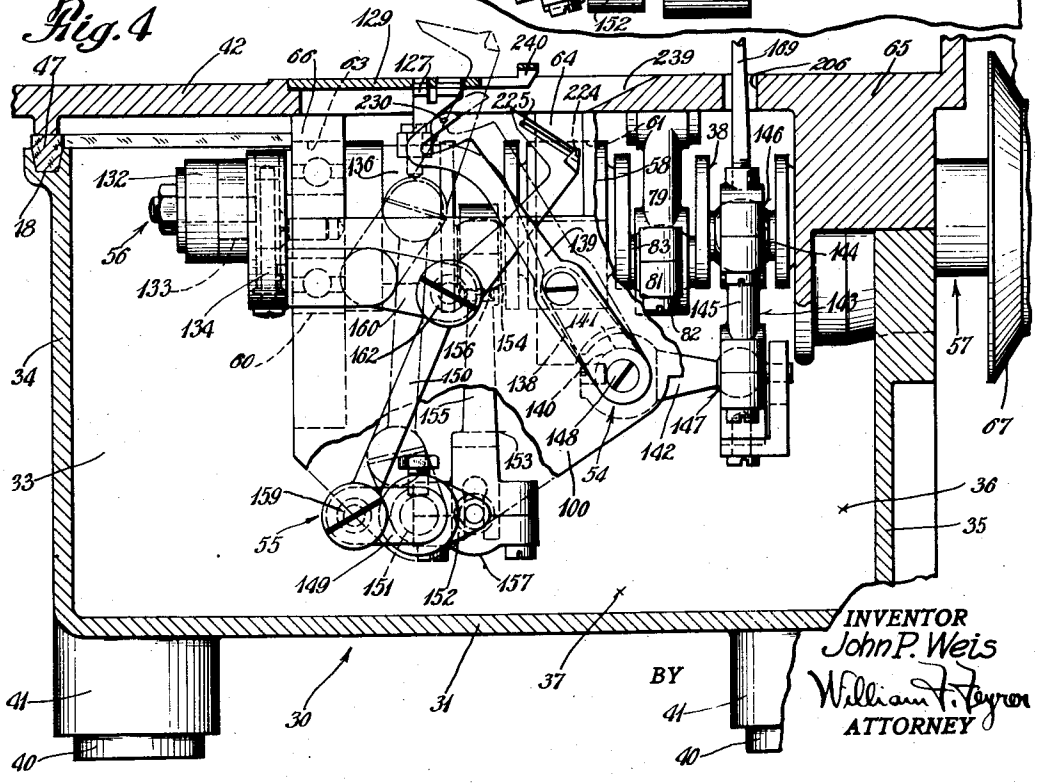


Fig. 4



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THREAD HANDLING DEVICE FOR SEWING MACHINES

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Fig. 5

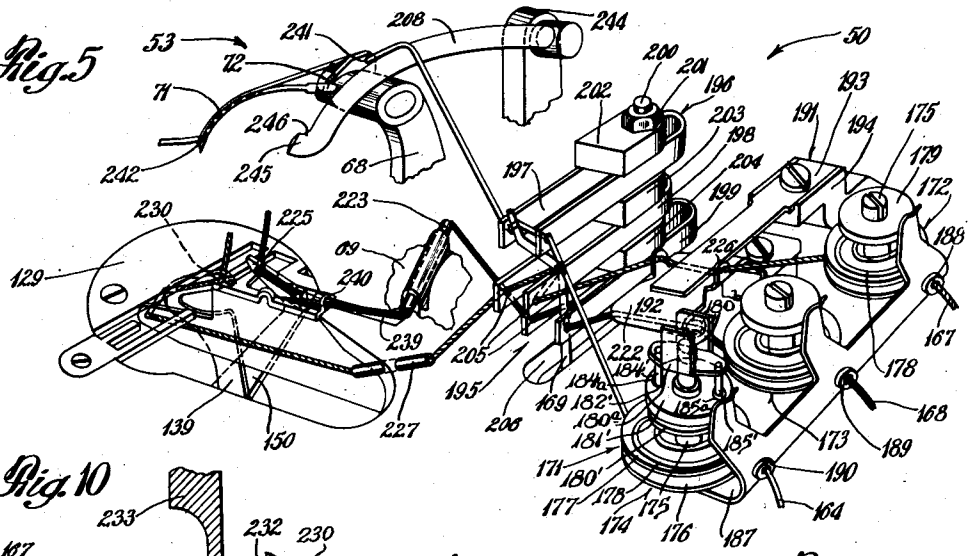


Fig. 10

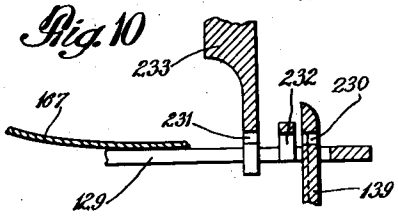


Fig. 7

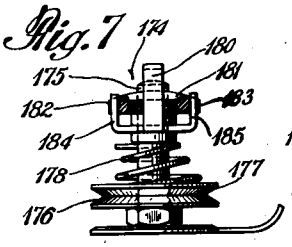
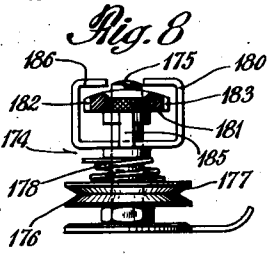


Fig. 8



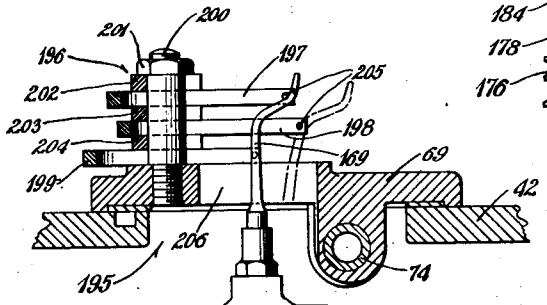
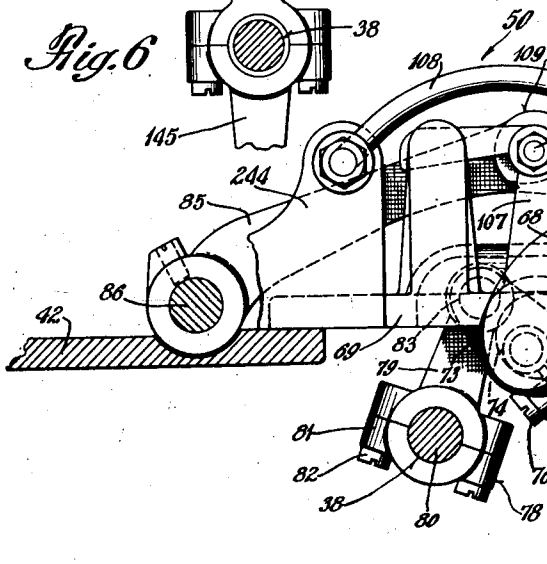


Fig. 6



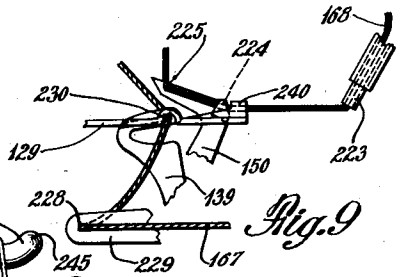


Fig. 9

Fig. 11

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THREAD HANDLING DEVICE FOR SEWING MACHINES

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Fig. 12.

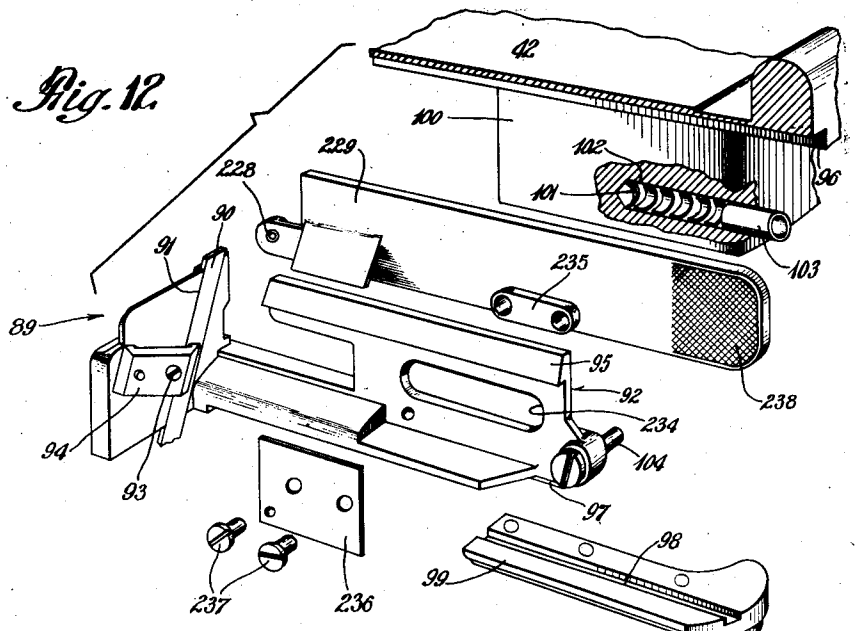
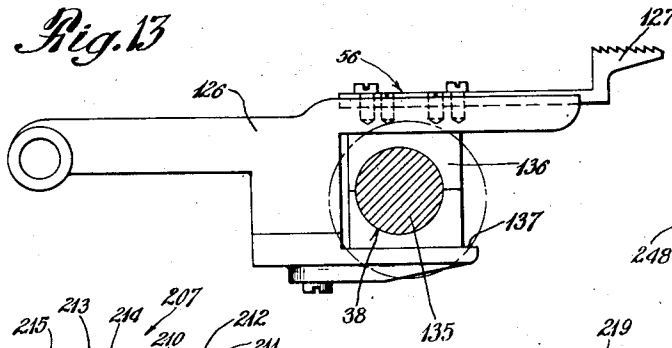


Fig. 13



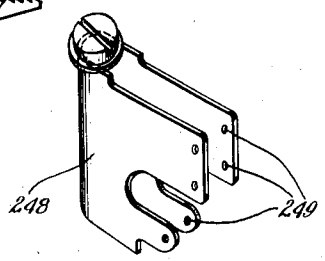


Fig. 14

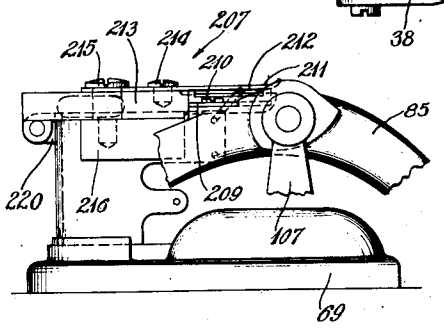


Fig. 15

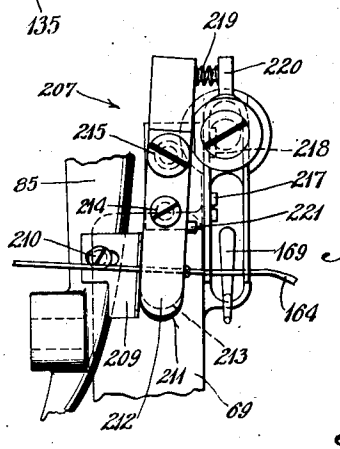


Fig. 16

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May 9, 1939. J. P. WEIS 2,157,373

THREAD HANDLING DEVICE FOR SEWING MACHINES

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Fig. 17

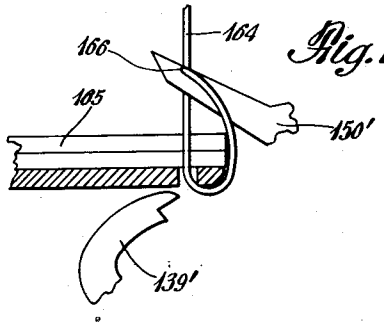


Fig. 18

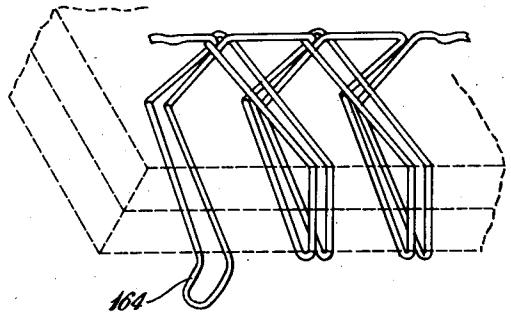


Fig. 19

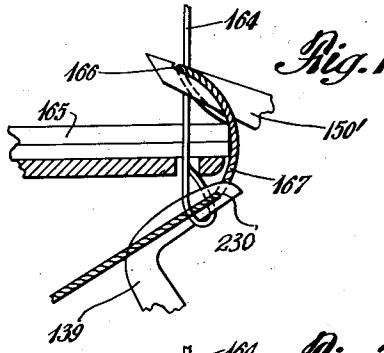


Fig. 20

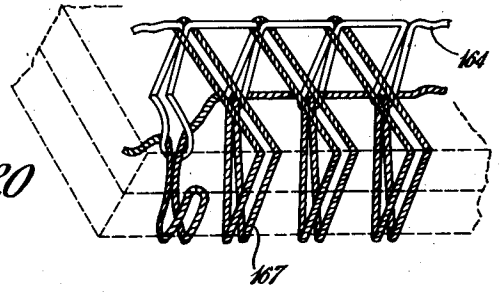


Fig. 21

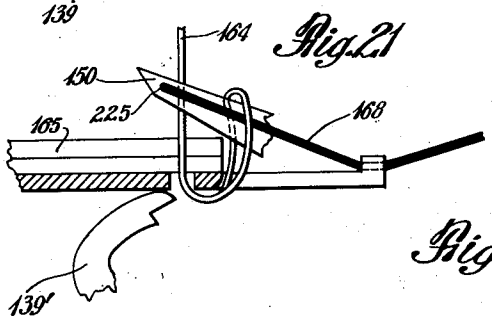


Fig. 22

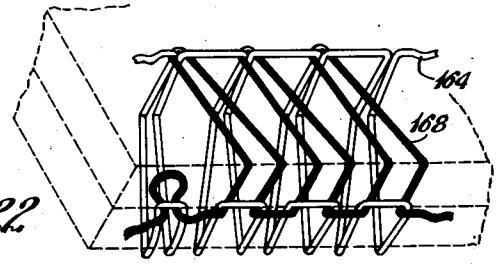


Fig. 23

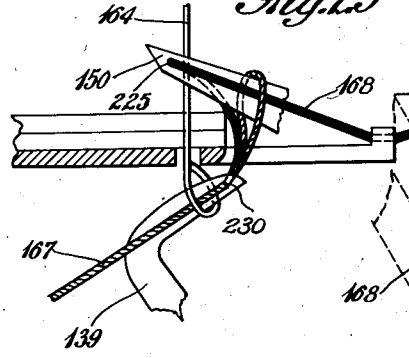


Fig. 24

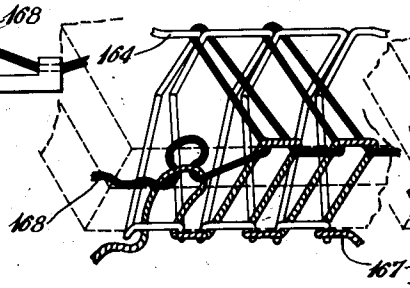
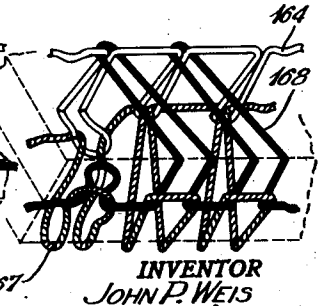


Fig. 25



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May 9, 1939. J. P. WEIS 2,157,373

THREAD HANDLING DEVICE FOR SEWING MACHINES

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Fig. 26

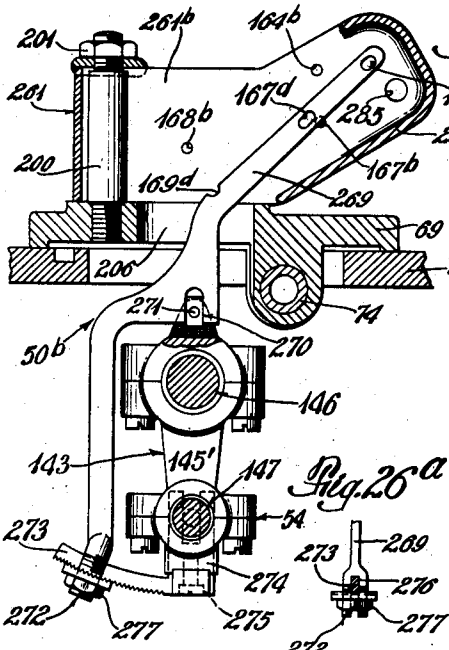


Fig. 26a

Fig. 27

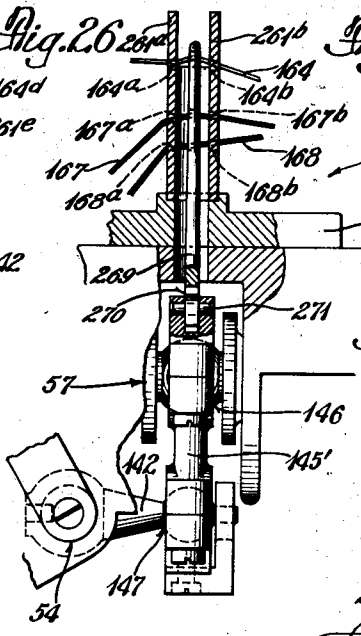


Fig. 31

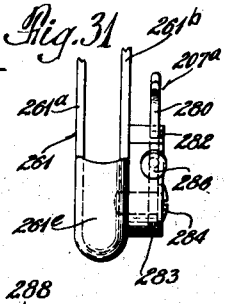


Fig. 28

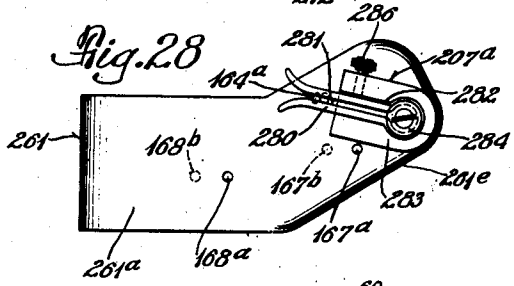


Fig. 29

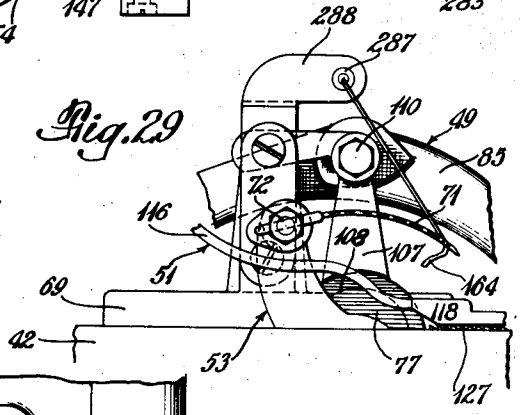
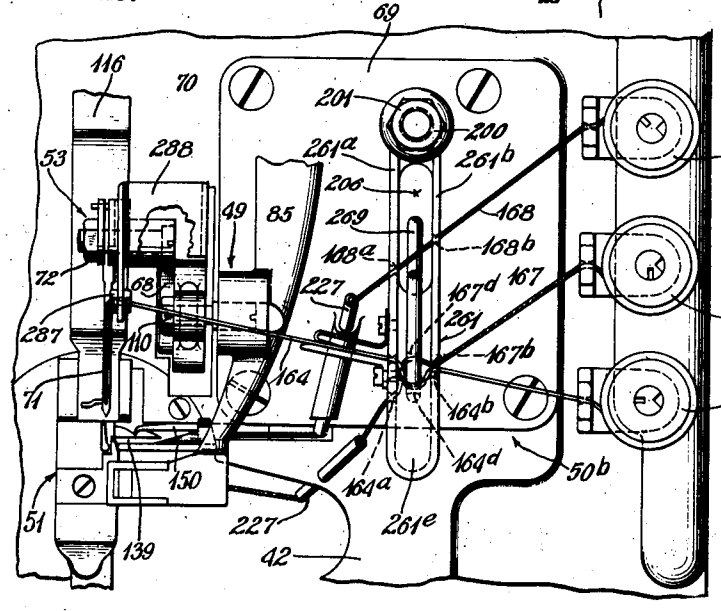


Fig. 30



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Patented May 9, 1939 2,157,373

UNITED STATES PATENT OFFICE

2,157,373

THREAD HANDLING DEVICE FOR SEWING MACHINES

John P. Weis, Nyack, N. Y., assignor to Willcox & Gibbs Sewing Machine Company, New York, N. Y., a corporation of New York

Application December 29, 1936, Serial No. 118,061

25 Claims. (Cl. 112—162)

This invention relates to improvements in thread handling devices for sewing machines, particularly overedge sewing machines. The present application is a continuation in part of my copending application, Serial No. 11,488 filed March 16, 1935.

Overedge sewing machines of various types are now in general use in many different trades. Even though most of these machines form a satisfactory overedge seam, usually separate machines are required for single, double, and triple overedge seams, and usually each has one or more design or operation shortcomings.

It is an important object of the present invention to provide a single overedge sewing machine having thread handling devices equally capable of sewing single, double, or triple thread overedge seams and to form different types of double and triple thread seams (e. g. Federal standard stitches 501, 502, 503, 504, and 505), Heretofore it has been customary to provide, purchase, and use separate machines for single, double, and triple thread overedge seam requirements, thus necessitating a very substantial and in some instances prohibitive investment in sewing machines, and resulting in both idle and overtaxed conditions with each type of machine, dependent upon the seam requirements in daily runs of work.

In overcoming these disadvantages and in meeting this object, the present invention provides a single sewing machine capable of forming single, double, and triple thread stitches, with novel thread handling devices and extremely simple stitch forming mechanism wherein it is necessary only to replace the loopers and none of the other operating parts when changing from one to the other of single, double, or triple thread stitches, and to merely regulate the thread handling devices when it is desired to alter the type of double or triple thread seam.

In many of the previously proposed overedge sewing machines, especially in the two and three thread machines, the needle and looper are inaccessible and thereby impede threading. Also, in many such previous machines it was necessary to pass the thread through devious paths and guides which produce adverse and breaking strains on the threads and make it hard for the operator to observe whether threads are broken, tangled, or if they are properly tensioned.

It is an object of the present invention to provide an overedge sewing machine which may be initially threaded with ease, which will pass the threads through short direct paths to the needle and loopers, and will pass the threads through a localized and easily viewed portion of the machine.

With many prior overedge sewing machines considerable difficulty is encountered in properly tensioning the threads relative to, the inter-related needle and loopers during their travel relative to each other, and to the loops of the stitch. Another disadvantage is that in most machines great inconvenience is experienced in threading the lower looper; a lifting of the work plate or a partial disassembly of the machine being required.

It is a still further object of the present invention to obviate or to lessen these shortcomings.

Features of the improved threading and the thread devices or controls provided by the present invention include: structure making possible advantageous production of one, two, and three thread forms of overedge stitches in the same machine; very open and easily accessible thread guides; a plurality of thread guides movable relatively to each other, which, with only one movable member, are adapted to manipulate the threads to an ususual degree; a simple structural arrangement for lightly lubricating the threads; a form of thread guide adapted to slide exteriorly of the enclosed frame for threading and to slide within the frame in back of the looper; a curved puller member over which the needle pulls its own thread, the curve of which in relation to needle travel may be changed readily to alter and improve the stitch formation; a threading arrangement wherein all the threads travel from one side of the machine in a small path and in the same direction across the top of the machine so that the operator need look at only one point to be sure that threads are not broken and are feeding properly; an unusual tension which by a simple easy push, changes the stitch formation from one type seam to another; and special sights for facilitating threading both the lower and overedge loopers.

Yet another feature of the invention resulting from the accomplishment of the objects heretofore outlined is the inclusion of a single means for controlling the take-up of not only lower and overedge looper threads but also the needle thread.

Another feature of the invention is the provision of a thread nipper operable concurrently and in predetermined relation with a single means for controlling the take-up of the divers threads; which in its simplest form is operated

by the regular trimming mechanism in the machine.

A further feature of the invention resides in providing a novel means for detecting knots, slubs and the like in the needle thread as it is guided to the stitching mechanism, which might break the needle. In one form this means includes a novel structure for automatically cutting the needle thread when such a defect is encountered, and in another form it includes a very simple structure for seizing the knot, slub or the like remotely from the needle and breaking the defective thread.

A still further and very important feature of the present invention is the provision of a single means which is capable of taking up or pulling up both the looper and needle threads forming the stitches and concurrently pulling thread for the stitches from the tensions during one part of its movement, and also capable of taking up the slack thread of a looper or loopers and the needle during another part of its movement. A complementary feature is the provision of such a means which may be adjusted very readily to impart various extents of take-up to the formed stitches and pull-off of threads for the stitches, and also to make possible short and long extents of such movement when it is desired to make many or few stitches per inch.

Some of the advantages resulting from the above features in an overedge sewing machine are that the machine: may be easily and quickly threaded, and has short direct paths for the threads to the needle and loopers; has a minimum number of simple thread handling devices working upon the threads in a gentle manner so that it is possible to sew one-, two- and three-thread overedge seams of various forms in the one machine at very high speeds and to change from one form of stitch to another very easily; prevents needle breakage because of knots and slubs in the needle thread by cutting or by breaking the thread; has mechanism whereby all the threads are passed through a localized and easily viewed area; requires only one take-up arm to condition the needle thread and also one or two looper threads; provides structure, whereby, in one form, nipping the thread is not esential; imparts a half hitch, of the spreader or overedge looper thread on the needle, of the needle thread on the lower looper, and of the lower looper thread on the overedge looper, when the take-up occurs.

Other objects, features and advantages will appear hereinafter.

In the drawings, which illustrate the present preferred embodiments of the invention:

Figure 1 is a front view of an overedge sewing machine embodying the present invention.

Fig. 2 is a top view of the sewing machine shown in Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a diagrammatic view of the threading and thread handling mechanism.

Fig. 6 is a detail of the thread take-up.

Fig. 7 is a fragmentary detail of the special needle thread tensioning device provided by the present invention, in a raised or light tension position.

Fig. 8 is a view similar to Fig. 7 but showing the tensioning device in a lowered or tight tension position.

Fig. 9 is a fragmentary detail of the lower and overedge loopers, and means for facilitating the threading thereof.

Fig. 10 is a sectional view showing the means for facilitating the threading of the lower looper.

Fig. 11 is a fragmentary detail view of the needle and trimmer operating mechanism in the down or operative position.

Fig. 12 is an exploded view showing the lower looper thread guide, the lower trimmer blade carrier and a fragment of an adjacent portion of the work plate and a depending wall.

Fig. 13 is a detail view of the feed dog and feed dog carrier.

Fig. 14 is a detail of a modification of the thread guiding element of the thread take-up shown in Fig. 6.

Fig. 15 is a detail view of the automatic knot detecting and thread cutting device.

Fig. 16 is a top view of the knot detecting and thread cutting device disclosed in Fig. 15 showing the manner of its association with the trimming mechanism.

Fig. 17 is a fragmentary detail view of the loopers used for forming a single thread overedge seam.

Fig. 18 is an enlarged view of the single thread overedge seam formed by the machine of the present invention.

Fig. 19 is a detail view of the loopers provided by the present invention to form a double thread overedge seam.

Fig. 20 is an enlarged view of one form of double thread overedge seam.

Fig. 21 is a view similar to Fig. 19 but shows a modified looper arrangement for forming a slightly different type of double thread seam.

Fig. 22 is enlarged view of the modified form of double thread overedge seam.

Fig. 23 is a fragmentary view of the main form of loopers used with the present invention for forming triple thread overedge seams.

Fig. 24 is an enlarged view of one form of triple thread overedge seam formed by the present invention.

Fig. 25 is a view similar to Fig. 24 and shows a modified form of triple thread overedge seam formed by the present invention.

Fig. 26 is a fragmentary side view, similar to Fig. 6, of a modified form of the invention.

Fig. 26A is a fragmentary detail of the locking mechanism.

Fig. 27 is a front view, partially in section, of the structure shown in Fig. 26.

Fig. 28 is a side view, of a modified form of the thread guide shown in Figs. 6 and 4.

Fig. 29 discloses a modified guide for the needle thread.

Fig. 30 is a fragmentary top view of the structure shown in Figs. 26 through 29 inclusive.

Fig. 31 is a fragmentary top view of the structure shown in Fig. 28.

Before describing the present improvements and mode of operation thereof in detail it should be understood that the invention is not limited to the details of construction and arrangements of parts shown in the accompanying drawings, which are merely illustrative of the present preferred embodiments, since the invention is capable of other embodiments, and the phaseology employed is for the purpose of description and not of limitation.

The detailed description which follows is under various headings to facilitate an understanding of the various mechanisms and their mode of operation, and to disclose in particular the present

improved thread handling mechanism and the means of its association with the other elements of the sewing machine.

Main frame and general structure

The overedge sewing machine embodying the present invention comprises a main frame **30** having a bottom **31**, and having front, rear, left side, and right side walls **32**, **33**, **34** and **35** respectively, forming a chamber **36** providing a reservoir **37** for lubricant and serving as a housing to enclose the main drive shaft **38** and the principal driving connections. Preferably, for a purpose that will hereinafter be made clear, the front wall **32** is formed with a recess **39** at the right side thereof. Rubber or other resilient plugs **40** in bosses **41** are provided to minimize vibration between the machine and the support upon which it is placed.

The work plate **42** is supported on the main frame **30** by preferably spaced pivotal connections **43**, only one being shown in Fig. 2, including suitable rearwardly projecting lugs **44** on the main frame **30** and cooperating lugs **45** on the work plate **42** with set screws **46** therebetween, as may be seen best in Fig. 2. Because of the pivotal association of the work plate **42** with the main frame **30** ready access may be had to the various driving connections.

In order to provide an effective oil seal between the main frame **30** and the work plate **42** and also to provide a very effective noise and vibration absorber the present invention provides a cork, felt or light pad **47**, preferably located in a suitable channel **48** in the top edge of the various sides of the main frame **30**.

The work plate **42**, preferably and as shown, is adapted to advantageously support a trimming mechanism **49**, thread handling and control mechanism **50**, a presser device **51**, and a trimming mechanism and presser device shifter **52** on its upper side, and to support the main drive shaft **38** and associated needle operating mechanism **53**, looper mechanisms **54** and **55**, feeding mechanism **56** and the main driving mechanism **57** on its underside.

Each of the main elements of the machine, as in the case of the main frame described immediately above, will now be described in sufficient detail to enable a clear understanding of their relationship with the thread handling mechanism. For a more complete description of these other mechanisms reference is made to my copending application Serial No. 11,488 filed March 16, 1935, of which the present application is a continuation in part.

Main driving mechanism

The main driving mechanism **57**, best seen in Fig. 4, comprises a substantially one piece main drive shaft **38** having a sleeve bearing **58** near the middle and having a ball bearing **60** at the left side and a similar ball bearing, not shown, on the right side. These bearings **58** and **60** are supported relative to the work plate **42** in suitable coaxial bores **61** and **63** either by a forced fit or by conventional holding screws in walls **64** and **66** depending from the work plate. The bearing at the right, not shown, is supported in a bore in the depending wall **65**. If preferred, these bores may be conventional split bores with cap sections as shown in my aforesaid application Serial No. 11,488 filed March 16, 1935. A main drive pulley **67** is secured to the right end of the drive shaft in any suitable manner. Additional driving connections from the main driving mechanism to individual mechanisms will be described hereinafter.

Needle operating mechanism

The needle operating mechanism **53**, in the form herein disclosed, includes a needle carrier **68** pivotally supported for arcuate movement in bearings on the underside of a top housing **69** secured to the work plate **42** by screws **70**, as may be seen best in Fig. 2. The needle **71** may be clamped in a suitable hole in the carrier arm **68** by a nut **72**. A rearwardly extending arm **73** as may best be seen in Fig. 11, is secured to the shaft **74** of the needle carrier by a yoke **75** and a screw **76** to hold an eccentric **77** to the left side of the housing **69** and thereby prevent axial movement of the shaft.

In order to impart oscillatory movement to the needle **71** and the carrier arm **68** from the raised inoperative position, shown in Fig. 3 to the lower operative position shown in Fig. 11, the present invention provides a very short crank connection **78** comprising a crank-arm **79** secured to the crank **80** on the main drive shaft **38** as by a conventional cap **81** and screws **82** and joined by a pivot stud **83** to the rearwardly extending arm **73** as may be seen in Figs. 4 and 11, thus providing very short and substantially direct driving connections with very little inertia. The needle operating mechanism is much more completely disclosed in my aforementioned copending application Serial No. 11,488.

Trimming mechanism

The trimming mechanism **49** is best disclosed in Figs. 3 and 11. In its preferred form, as illustrated, it comprises an upper movable cutter **84** having an adjustable connection with a cutter carrier arm **85** mounted for pivotal and axial movement with a shaft **86** which is supported in upstanding lugs **87** and **88** on the work plate **42**.

The lower cutter **89**, disclosed most clearly in Figs. 1, 11 and 12, comprises a blade **90** secured in a channel **91** in a lower cutter carrier **92** by means of a holding screw **93**. Preferably it is provided with an integral finger piece **94** at its lower end adapted to facilitate vertical shifting of the cutter in the channel. The lower cutter carrier, as seen in Figs. 1 and 12, is provided with a tongue **95** entering a channel **96** in the underside of the work plate **42** and with a secondary tongue **97** entering a channel **98** in a retaining plate **99** secured to a depending wall **100** on the work plate. These channels permit the carrier to be slid transversely relative to the line of feed. A spring **101**, see Figs. 2 and 12, located in a bore **102** in the front depending wall **100** normally urges a follower **103** outwardly to engage a pin **104** on the carrier **92** to thereby yieldingly pull and maintain the lower cutter blade **90** in good shearing engagement with the upper cutter **84**. A depending finger **105** on the upper cutter is always in engagement with the lower cutter blade **90** so that the spring **101** will not pull the lower cutter out of shearing engagement or into a position directly underlying the upper cutter.

A driving connection **106** for the upper cutter **84**, best seen in Figs. 3 and 11, comprises a crank-arm **107** having a bearing **108** at its lower end adapted to receive the eccentric **77** on the shaft **74** of the needle carrier **68**, and at its upper end having a pivotal connection **109** to the cutter carrier arm **85** as by a stud **110**. The bearing **108** preferably, as shown, is made integral with the crank-arm **107** so that eccentric **77** may be

slid into the bearing prior to tightening the arm 107 on the shaft 74. As the needle carrier 68 is oscillated, the eccentric 77 through the crank-arm 107 imparts absolute coordinate oscillatory movement to the carrier 85 and cutter 84 and also to the pivotally mounted shaft 86 to which the cutter carrier 85 is fixed.

Presser device

The presser device 51 which may be seen best in Figs. 2 and 3 comprises a carrier block 111 secured on a rod 112 by a screw 113, the rod having axial and rotary movement in the upstanding lugs 87 and 88 on the upper side of the work plate 42. The carrier block is provided with a finger 114 having a channel 115 adapted to receive a spring carrier-arm 116 and to locate it against lateral displacement, while a screw 117 holds it against vertical displacement relative to the block. Divers presser feet 118 may be secured to the front end of the spring carrier-arm.

The main pressure of the presser foot toward the work plate is accomplished by a coil spring 119 located in a suitable bore 120 in the carrier block 111, as may be seen best in Fig. 3, preferably having a ball 121 at the lower end adapted to slide over the work plate 42. The bore 120 prevents the spring from tilting and cramping the carrier block, while a screw stud 122 permits various pressure adjustments.

Secondary pressure control is provided by a regulating screw 123 on a finger portion 124 of the carrier block while an arm 125 extending rearwardly of the carrier block 111 is provided to lift the presser foot into an inoperative position relative to the work plate 42. The presser device is much more completely disclosed in my copending application Serial No. 86,922, filed June 24, 1936.

Feeding mechanism

Because of the fact that the novel thread handling mechanism of the present invention is capable of being associated with feeding mechanisms other than the differential feeding mechanism fully described in my copending applications Serial No. 11,488 and Serial No. 27,773 filed March 16, 1935 and June 21, 1935, respectively, and in order to enable a clearer showing of certain of the other features, the differential feed dog and associated operating connections disclosed in the above named applications have been omitted from the drawings.

The feeding mechanism 56 herein disclosed, see particularly Figs. 3, 4 and 13, includes a feed dog carrier 126 supporting a feed dog 127 for reciprocation in a slot 128 in a throat plate 129. Feed rocking movement is imparted to the feed dog through a feed rocker frame 130, pivotally connected to the carrier 126 by a shaft 131 and operatively connected by a crank-arm 132 to an eccentric 133 on a head 134 on the main drive shaft 38.

Feed lifting movement is imparted to the feed dog through a crank 135 on the main drive shaft 38, fitted in a split bearing 136 slidably mounted in an elongated slot 137 in the feed dog carrier 126.

With the above arrangement of elements a four motion travel is imparted to the feed dog in timed relation with the needle and looper movements.

Looper mechanisms

The looper mechanisms may be seen best in Figs. 3 and 4 and comprise a lower looper mechanism 54 and an overedge looper mechanism 55, the latter having a retracted position under the work plate 42, as shown in full lines in Fig. 4, and an advanced operating position above the work table and materials being sewed, as shown in dot and dash lines in Fig. 4. These looper mechanisms are capable of forming a usual single, double, and triple thread seam, type 501, 502, 503, 504, and 505 "Federal specifications for stitches, seams, and stitching" shown in Figs. 18, 20, 22, 24, and 25 respectively.

The novel thread handling mechanism 50 described hereinafter assists materially in the formation of these various stitches. The mechanism for the three thread stitch (Figs. 24 and 25) is most completely illustrated in the present drawings and for that reason will be described first.

The lower looper mechanism 54 (Fig. 3 and Fig. 4 particularly) comprises a looper carrier-arm 138, supporting a looper 139, on a shaft 140 pivotally mounted in a bearing 141 in the depending wall 100, and having an arm 142 extending laterally of the machine to a crank connection 143 with the crank 144 on the main drive shaft. Preferably, the connection comprises a crank-arm 145 with a ball and socket joint 146 at the upper end and a similar ball and socket joint 147 at its lower end. The lower looper 139 is secured to the looper carrier-arm 138 by screws 148 and may be readily interchanged for other slightly different shaped loopers when the size of the thread, materials being operated upon, stitch, or other similar factors make such change desirable.

The overedge looper mechanism 55 comprises a looper carrier 149, interchangeably supporting a looper 150, on a shaft 151 shown in Figs. 3 and 4, and which has a secondary arm 152 with a crank connection 153 to the crank 154 on the main drive shaft. The crank connection preferably includes a crank-arm 155 having a ball and socket joint 156 at its upper end to the crank 154 and a similar ball and socket joint 157 to the arm 152 at its lower end. The shaft 151 is journaled in a bearing 158 in the depending wall 100. The looper 150 is supported by the carrier 149 on a removable pivot screw 159, and intermediate its length is connected to a crank-arm portion 160 of a shaft 161 by a second removable pivot screw 162. This looper mechanism imparts both a vertical and oscillatory movement to the looper 150; viz, when the crank 154 is in the uppermost position it pulls the crank-arm 155 upwardly and causes the shaft 151 to be moved into its farthest counter-clockwise position wherein the carrier 149 and the lower end of the looper 150 are moved down and wherein the crank-arm 160 is similarly moved down so that the top end of the looper is underneath the work support and is in a retracted position relative to the materials being sewed.

However, when the crank 154 is rotated toward the lower position it imparts a clockwise rotation to the shaft 151, initially lifting the overedge looper 150 to a point above the top of the work plate 42 and then imparting a counter-clockwise movement to the looper in order to move the thread carrying point thereof over the top of the material for well known cooperation with the needle 71.

In general, and dependent upon the type of seam desired, the lower looper mechanism 54 may carry a hook-type looper 139' as shown in Figs. 17 and 21, or carry an eye-type looper 139 as shown in Figs. 4, 19 and 23 particularly. Similarly, the overedge looper mechanism 55 may carry a hook-type overedge looper 150' as shown

in Figs. 17 and 19, or an eye-type overedge looper 150 as shown in Figs. 4, 21 and 23 particularly. The main body section of all the loopers and structure for supporting and driving them is alike, the only difference being in the shape at the top end as illustrated. A change over from one type of looper to another may be easily accomplished in the case of the lower looper by removing the screws 148 and in the case of the overedge looper by removing the pivot screws 159 and 162.

When the loopers 139' and 150' of a hook-type (Fig. 17) are used, and a thread 164 is carried through the work 165 by the needle 71 the lower hook-type looper 139' catches the needle loop, carries it to the edge of the material where the overedge hook-type looper 150' catches it in the notch 166 during its upward movement and during retraction of the lower looper 139' to carry it into the path of the needle to form the stitch type 501, as shown in Fig. 18.

When an eye-type lower looper 139 and a hooktype overedge looper 150' (Fig. 19) are used, the lower looper 139 and a lower looper thread 167 are passed through the loop of the needle thread 164, whereupon the notch 166 of the overedge looper 150' catches the lower looper thread to carry it upwardly over the edge of the work and into the path of the needle 71 to form the double thread seam, type 502, clearly illustrated in Fig. 20.

When a lower hooked looper 139' and an overedge eye-type looper 150 (Fig. 21) are used, the lower looper 139' catches the loop of the needle thread 164 and carries it to the outer edge of the work 165 where the overedge looper 150 carrying an upper looper thread 168 passes through the needle loop upwardly over the work and into the path of the needle which, as it passes into the work, catches and holds the looper thread 168 to form the overedge seam, type 503, shown in Fig. 22.

Three thread seams are formed by the lower eye-type looper 139 and the overedge eye-type looper 150 (Fig. 23). The lower looper 139 catches the loop of the needle thread 164, carries its own lower looper thread 167 to the edge of the work 165 where the overedge looper, while carrying its own upper looper thread 168 over the work to be engaged by the needle, passes through the lower looper thread 167. By suitable adjustment of the thread handling mechanism 50 the three thread seams, type 504 or 505 of Figs. 24 and 25 respectively, may be formed.

Thread handling mechanism

Ordinarily, it is a very real problem to thread an overedge sewing machine, and especially one in which three threads are used. Very often the operating parts are at such inaccessible and awkward places that the thread must be directed through divers paths, which increase the possibility of the thread being broken as well as increasing the difficulty of properly threading the needle and the loopers. The present invention provides a machine which is remarkably easy from the standpoint of threading, tensioning, and thread control which are all highly important from the standpoint of proper overedge seam formation.

The thread handling mechanism 50 of the present invention has many novel features and is unusually efficient. As may be seen in Figs. 1, 2 and 5, all the threads may be passed in substantially one direction, may be threaded through the machine easily, may be observed easily for tensioning, tangling, and breaking, and as described hereinafter are regulated advantageously. These factors all aid materially in having the machine perform satisfactorily in forming stitches at high speeds. Of particular importance, only one take-up finger 169 is adapted to control all three threads instead of three separate fingers. The action of the threads is simple and free of strain so that there is no danger of breaking. Also, a change from a tight seam to a loose seam is effected by merely turning a part.

Considering in more detail the novel thread handling mechanism provided by the present invention it is seen that secured to an upstanding flange portion 170 adjacent the right side edge of the work plate 42 is a battery 171 of thread tensioning devices 172, 173 and 174 for the lower looper, overedge looper and needle threads 167, 168 and 164 respectively. Each of these devices includes an upstanding pin 175 on which is mounted a pair of tension disks 176 and 177 normally maintained in yielding engagement by a spring 178. Adjusting nuts 179 in screw threaded relation with the pins 175 of the looper tensioning devices 172 and 173 enable a variation of the tension applied to the looper threads 167 and 168.

Of particular importance, however, it is to be noted that the tensioning device 174 for the needle thread, preferably and as shown in detail in Figs. 7 and 8, includes a plate 180 loosely mounted on the upstanding pin 175 and interposed between the spring 178 and a modified adjusting nut 181 having apertures 182 and 183 therein adapted to receive fingers 184 and 185 on the plate 180. When, as shown in Fig. 7, the plate 180 is moved to a position in which the fingers 184 and 185 are in register with and pass through the apertures 182 and 183 in the adjusting nut, the spring pressure on the tensioning disks 176 and 177 is reduced. When, however, as shown in Fig. 8, the plate is moved downwardly and turned so that the fingers 184 and 185 are not in register with the apertures 182 and 183 in the adjusting nut there is an increase in the spring pressure on the tensioning disks 176 and 177. Fingers 186 on the plate 180, extending upwardly and thence inwardly over the adjusting nut, facilitate a ready manipulation of the plate to vary the spring pressure on the tension disks 176 and 177.

A slightly different needle thread tensioning device 174 is shown in Figs. 1, 2 and 5. Like the device shown in Figs. 7 and 8 it includes a pair of tension disks 176 and 177 normally maintained in yielding engagement by a spring 178. Also, a plate 180' is provided loosely mounted on an upstanding pin 175 and interposed between the spring 178 and an adjusting nut 181'. This adjusting nut 181' has holes 182' therein adapted to receive pins 184' and 185' on the plate 180'. When the plate 180' is pushed downwardly to compress the spring 178, shoulders 184*a* and 185*a* on the pins 184' and 185' are adapted to engage with the underside of the nut 181'. When the shoulders 184*a* and 185*a* are disengaged from the underside of the nut 181' the shoulders pass upwardly through the holes 182', see Fig. 1, thus permitting the plate 180' to move upwardly and the spring 178 to expand. A connecting plate 180*a* on the top of the pins 184' and 185', from which end extend upwardly ears 180*b*, provides an advantageous structure for facilitating a manipulation of the plate 180' to vary the spring pressure on the tension disks 176 and 177.

There is thus provided in both the form shown

in Figs. 7 and 8 and in the form shown in Figs. 1, 2 and 5, an especially advantageous means for quickly and accurately moving the thread tensioning device 174 to two different tension stations. Thus, after determining the proper tension for different types of stitches it is possible to set the adjusting nut 181, or 181' as the case may be, in a definite position and to thereafter insure a uniform variation in the tension by merely forcing the spring downwardly a distance equal to the heighth of the fingers 184 and 185, or of the shoulders 184a and 184b. Such an arrangement is especially useful when the tensioning device is in a light tension position to facilitate the formation of the loose seam disclosed in Fig. 24 and when it is desired to quickly change over from this seam to the tight seam shown in Fig. 25, the formation of which latter seam is facilitated by an increase in the needle thread tension.

Preferably, and as shown, a guide plate 187 is associated with the battery 171 of tensioning devices, having eyes 188, 189 and 190 therein for directing the respective looper and needle threads to the tensioning devices.

Positioned adjacent the battery 171 of tensioning devices is a nipper or thread holding mechanism 191 comprising a lower plate 192 secured to the top housing 69 and a spring finger 193 movable into and out of clamping position with respect to the lower plate in timed relation with the stitching mechanism. Timed oscillation of the finger 193 of the nipper mechanism 191 is achieved by an operative connection to the trimming mechanism 49 through an attachment to the oscillatable trimming mechanism shaft 86 by a connecting lug 194.

Of particular importance, to the left of the nipper mechanism there is secured to the top housing 69 a thread take-up device 195 in which only one take-up member is required to condition the needle thread and one or both looper threads. Preferably, and as shown most clearly in Figs. 5 and 6, the thread guiding element 196 of this take-up device includes a plurality of U-shaped plates 197, 198 and 199 secured to the top housing 69 by a screw 200 and nut 201 which hold the spacers 202, 203 and 204 in frictional engagement with the respective plates to thereby prevent inadvertent movement thereof. Each plate has eyelets 205 therein adapted to receive thread from the respective looper and needle thread tensioning devices 172, 173 and 174.

In its now preferred form, a single finger 169 is provided upon the top of the crank-arm 145 of the main drive shaft 38 and passes upwardly through an aperture 206 in the work plate 42 to oscillate and reciprocate within the U-shaped guide plates 197, 198 and 199 once each time the needle 71 and loopers 139 and 150 are actuated, and in synchronization therewith to take up the slack thread as the needle and loopers move toward a retracted position. The guide plates 197, 198 and 199 may be shifted en masse toward or away from the movable take-up member and may be shifted individually relative to the take-up member and relative to each other so that a wide variety of thread conditioning may be effected at one point and with only one movable member.

As the needle thread 164 passes from the tensioning device 174 it is directed to the eyelets 205 in the upper U-shaped plate 197 and thence passed through a knot detector and thread cutter 207 interposed between a thread puller bar 208 positioned to the right of the needle carrier 68, and the thread take-up device 195. This knot detector and thread cutter 207 comprises a cutting knife 209 secured to the upper cutter carrier arm 85 by a screw 210 and movable upwardly and downwardly therewith, and a second cutting knife 211 normally maintained in spaced relation to the knife 209 but movable into cutting relationship thereto when a knot, slub, or the like, in the needle thread passes through the detector. The cutting knife 211 includes two superposed fingers 212 and 213, at least one of which is preferably of spring material, held together by pins 214 and 215, one of the pins 215 passing completely through each of the fingers and through a supporting plate 216 secured to the thread guiding element 196 of the thread take-up device 195 by screws 217 and 218. As shown most clearly in Figs. 2, 15 and 16, a spring 219 interposed between the knife 211 and a projection 220 on the rear of the thread guiding element 196 of the take-up device normally maintains the knife 211 in spaced relation to the cutting knife 209, the stop 221 maintaining the knife 211 in spaced relation to the take-up device.

Under normal conditions the needle thread 164, passing between the fingers 212 and 213 of the knife 211, is not sufficient to swing the knife 211 on the pivot provided by the pin 215 into cutting relationship with the cutter 209. However, when a knot approaches the detector sufficient pull is exerted on the knife 211 to compress the spring 219 and bring the knife 211 into cutting relationship with the oscillating knife 209 carried by the upper cutter carrier arm 85. In this manner each time a knot or slub is detected in the needle thread, the detector and cutter is swung to a position to sever the needle thread.

The provision of this thread cutter and detector is of considerable importance because as the needle 71 utilized is a curved one there is a tendency for the extra strain on the thread, caused by a knot coming against the needle when it approaches the eye thereof, to bend the needle out of its proper curvature path causing skipped stitches and a breakage of needles. By means of the thread knot detector and cutter provided by the present invention this danger of breaking or adversely bending the needle and causing defective work is eliminated.

The overedge looper thread 168 passes from the tension device 173 to a guide tube 222 and thence through the eyelets 205 in the lower U-shaped plate 199 of the take-up device 195. From the take-up device the overedge looper thread passes through a guide tube 223 in the top housing 69 to eyes 224 and 225 in the overedge looper 150.

The lower looper thread 167 passes from the tension device 172 and is guided by the eyelets 226 to pass between the oscillatable finger 193 and the fixed plate 192 of the nipper or thread holding device 191. From the nipper device the lower looper thread 167 passes through the eyelets 205 in the middle or intermediate guide plate 198 of the take-up device 195 and thence through a guide tube 227 in the work plate 42 to an eyelet 228 in a slide 229 associated with the lower cutter carrier 92 in a manner to be hereinafter described in detail. From the eyelet 228 the lower looper thread 167 passes to the eye 230 in the lower looper 139.

To facilitate threading of the loopers 139 and 150 special and advantageously located sights and guides are provided by the present invention.

Thus sights 231 and 232 in a backing plate 233 for the upper cutter 84 and in the throat plate 129 respectively (Figs. 5, 9 and 10) guide the lower looper thread 167 to the eye 230 of the lower looper. Also to facilitate a threading of the lower looper the slide 229, to which reference was made above, is movable to the right and to the left to bring the eyelet 228 therein from its normal position within the chamber 36 defined by the side walls of the main frame to a position outside of the chamber and in the recess 39 formed in the front wall 32 of the main frame. In this manner the eyelet 228 may be readily threaded and the lower looper thread 167 then passed through the aligned sights 231 and 232 above referred to and through the eye 230 in the lower looper. After the thread has been inserted through the eyelet in the slide and through the eye in the looper 139 the slide may then be moved to its normal position within the chamber 36.

A particularly advantageous manner of mounting the slide 229 for movement of the eyelet 228 into and out of the chamber 36 is taught by the present invention. As seen most clearly in Fig. 12, the lower cutter carrier 92 is provided with an opening 234 therein adapted to receive a guide lug 235 on the slide 229. A plate 236 secured to the guide lug 235 by means of a pair of screws 237 laps the front side of the lower cutter carrier 92 and serves to maintain the slide 229 in association with the rear side of the lower cutter carrier 92. With this construction the slide 229 may be easily moved to the right and to the left relative to the lower cutter carrier to carry the eyelet 228 from its normal position within the chamber to a position outside of the chamber where it may be easily threaded. A knurled section 238 at the right end of the slide 229 enables a ready grasping thereof by an operator to move the slide to desired positions.

For facilitating the threading of the overedge looper 150, as shown in Figs. 2, 4, 5 and 9, a channel 239 is provided in the work plate 42 beneath the guide tube 223, and a sight 240 is formed on the throat plate 129 aligned with the plane of travel of the overedge looper. By this arrangement, when the overedge looper 150 is moved to a position, shown in Fig. 9, the eyelet 224 of the overedge looper is aligned with the sight 240 and a thread may be readily passed through the sight and into the eyelet 224 of the looper 150.

The provision of the various sights and guides above described for facilitating the threading of the two loopers 139 and 150 are of considerable importance from the standpoint of an economical operation of the machine. Because of their incorporation much time is saved that would otherwise be taken up by the threading of the respective loopers.

The needle thread 164 upon passing from the take-up device 195 and through the knot detector 207 then passes over the puller bar 208 prior to entering an eyelet 241 carried by the needle carrier 68 and the working eye 242 in the needle 71. This puller bar 208 is of a substantially arcuate shape, corresponding generally to the path traversed by the needle carrier 68, and is pivotally mounted at its rear end 243 in an upstanding lug portion 244 of the work plate 42 to enable the free end 245 of the bar to be moved to and from raised and lowered positions relative to the work plate. When the free end 245 is in a lowered position, the bar 208 offers relatively little resistance to the needle thread and little is pulled from the tensioning device 174, but when moved to a raised position greater resistance is offered to the thread and a greater amount of thread is pulled from the tension device 174. With this thread puller bar 208, the pulling of the needle thread occurs mainly before the needle and thread enter the work so that thread pulling strain is gone while the needle and thread are being forced through the work, since the arc of the free end of the puller bar recedes with respect to the arc of the needle travel. A small upturned portion 246 at the free end 245 of the puller bar serves to prevent the thread from slipping off the bar as it is carried forwardly thereon by the needle carrier. By a simple manipulation of the bar it is thus possible to cause a greater amount of needle thread to be pulled to form a seam, such as shown in Fig. 24, or a less amount of needle thread to be pulled to form a seam, such as shown in Fig. 25.

With the thread handling mechanism provided by the present invention it is readily apparent that both looper threads 167 and 168 and also the needle thread 164 are all guided separately across the work plate 42 in one direction and in full view of the operator. Only one movable member 169 is utilized to take up the slack in all three sewing threads 164, 167 and 168. By loosening the nut 201 it is possible to move the U-shaped plates 197, 198 and 199 forwardly or rearwardly relative to the take-up finger 169, either together or separately and relatively to each other. In this manner various amounts of slack may be taken up depending on the particular type of seam being sewn.

The nipper 191, oscillating with the trimmer shaft 86 and hence in timed relation with the movement of the loopers 139 and 150 and needle 71 moves to a thread holding position each time the single take-up finger 169 moves to take-up the slack in the various threads. In this manner it is assured that the take-up finger 169 will pull up slack from the looper 139 rather than from the tensioning device 172 when the looper is retracted. A set screw 247 in the lug 194 by which the nipper 191 is associated with the shaft 86 enables a clamping of the nipper mechanism to the shaft in different positions so that, if desired, the timing of the nipper movement with respect to the take-up finger movement may be varied.

If desired, the thread guiding element of the take-up mechanism may be made in the form of an integral U-shaped plate, as shown in Fig. 14, rather than built up of a plurality of separate U-shaped guide plates, as heretofore described and shown most clearly in Fig. 5. This modified U-shaped guide plate 248 is provided with three sets of eyes 249, one set for each of the respective looper threads 167 and 168 and needle thread 164. While the extent of take-up of the different threads may not be separately adjusted as in the case of the three plate take-up device first described, still, it is possible, by moving the entire guide plate 248 forwardly or rearwardly relative to the movable finger 169, to vary the take-up of all three threads simultaneously.

Figs. 26 through 30, inclusive, disclose a further modified form of thread handling mechanism 50b which is similar in many respects to the forms previously described because only one take-up or control finger 269 conditions the needle thread and either one or two looper threads.

The main points of difference are that a modified guide 261 is provided in which sets of eyes 164a, 164b, 167a, 167b and 168a and 168b are pro-

vided at an angle to each other in opposite walls 261*a* and 261*b* so that the threads travel in a practically straight line from the tensions 164*c*, 167*c* and 168*c* to the eyelets or the like beyond the guide 261 as may be seen best in Figs. 26, 28 and 30; also in the provision of a long take-up or control finger 269 provided with holes 164*d* and 167*d* whereby the looper and needle threads 167 and 164 are acted upon by the finger 269 at both sides of its circular travel, as it is operated in the manner of the finger 169 by the looper mechanism 54 described hereinbefore (e. g. if the line or axis between the eyes 164*a* and 164*b* and of the eyes 167*a* and 167*b* are substantially midway the circular travel of the finger 269). A similar hole may be provided for the looper thread 168, but has been found unnecessary. In some instances a notch 169*d* has been found helpful when it is desired (Fig. 26) to have the finger 269 work upon the thread 168 a longer time or pull a greater extent.

The finger 269 may be secured to the top of the connecting arm 145' like the finger 169. Preferably, however, it is made long (see Figs. 26 and 27) with a block and slot connection 270 at the center to a pin 271 in the top of the arm 145' and has an adjustable connection 272 at its lower end. The latter preferably comprises a serrated finger 273 secured to a cap 274 as by a screw 275, the finger being adapted to enter a slot 276 in the finger 269 where it is locked in any desired position by a nut 277. By locating the control finger 269 inwardly or outwardly on the serrated finger 273 respectively greater and shorter extents of travel are imparted to the top end of the control finger and location thereof relative to the thread eyelets in the guide 261 may be changed, to efficiently control the thread and to vary the appearance and form of the overedge stitch. Shifting of the guide 261 forwardly or rearwardly of the machine and of the control finger 269 under the post 200 and lock nut 201 serves a similar purpose. The guide 261 may have an enclosed front 261*e* serving as a protector.

The latter form of thread control mechanism 50*b* works so satisfactorily that it is not necessary to use the thread nipper. The control finger 269 serves effectively during one part of its movement or circular travel to pull the needle and looper threads and to pull thread from the tensions to form stitches and in the other part of its movement serves to effectively pull up any slack in the threads as the needle and loopers move into retracted positions. Also, because of this action it serves to effectively form what may be termed a half hitch of the overedge looper thread on the needle, of the needle thread on the lower looper and of the lower looper thread on the overedge looper or spreader, when the take-up occurs. Consequently the stitched materials are not adversely puckered and a uniform result is assured.

In place of the knot detector and automatic cutter 207 hereinbefore described a simple stationary knot or slub catcher and thread breaker 207*a* may be provided (see Fig. 28) comprising merely a pronged member 280 adjacent an eye in the guide 261 having a slot 281 adapted to receive and pass a normal thread but to prevent a knot from passing through. The split member seizes or stops the knot or slub and thereby causes the thread to break. Preferably the pronged member is located in a nest 282 of a block 283 secured to either side of the guide 261, as by a screw 284, in a threaded hole 285. Tightening or loosening screw 286 adjusts the slot 281 for thin and thick thread.

In some forms of stitch and work (e. g. thick thread and heavy materials) it is desirable to have the needle thread pass in an almost straight line to the needle 71, rather than over the puller member 208 before described. A structure for this purpose is disclosed in Fig. 29 comprising a guide 287 in a plate 288.

Whether the take-up mechanism device in Fig. 5, the modified take-up devices disclosed in Fig. 14 or in Figs. 26 through 30 are used there results a particularly simple mechanism in which only one take-up finger 169 or 269 is utilized for taking up the slack on all three of the threads 164, 167 and 168. Moreover, it is to be observed that either the three plate guiding elements 196 or the one plate guiding elements 248 and 261 serve to localize the one, two or three threads, and that the aperture 206 in the work plate 42 through which the take-up finger extends and in which it oscillates provides an opening through which oil mist created by the high speed operation of the driving connection may pass from the interior of the chamber 36 upwardly to be deposited on the various threads being passed through the eyelets of the take-up device. Since the threads are always of small diameter and pass through the guide at a very high speed they collect but an infinitesimal amount of oil mist, just enough to facilitate the threads passing through and over subsequent guides and to thereby minimize thread breakage, and not enough to discolor, stain, or otherwise mar the materials, sewed.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

Having thus described the invention what is claimed as new is:

1. In an overedge sewing machine the combination of sewing mechanism including a movable needle, lower looper and an overedge looper; feeding mechanism; means for guiding three threads separately to the needle, lower looper and the overedge looper; only one movable take-up member associated with said last named means for operation on said threads; and driving mechanism for operating said sewing mechanism, feeding mechanism and the one movable take-up member concurrently.

2. In an overedge sewing machine the combination of sewing mechanism including a movable needle, lower looper and an overedge looper; feeding mechanism; means for guiding three threads separately to the needle, lower looper and the overedge looper; driving mechanism adapted to operate said sewing mechanism and the feeding mechanism concurrently; a crank-arm in said driving mechanism and associated with the sewing mechanism; and only one take-up member actuated by said crank-arm and associated with the guiding means and adapted to condition the threads therein.

3. In an overedge sewing machine the combination of sewing mechanism including a movable needle, and at least one looper; feeding mechanism; normally stationary means, for guiding needle and looper threads at longitudinally spaced points; only one movable take-up member associated with said normally stationary means for operating on said needle and looper threads intermediate said spaced points; and driving mechanism for operating said sew-

ing mechanism, feeding mechanism and one movable take-up member concurrently.

4. In an overedge sewing machine the combination of a sewing mechanism including a movable needle and at least one looper; feeding mechanism; normally stationary means, for guiding needle and looper threads at longitudinally spaced points; a normally stationary puller member for the needle thread; only one movable take-up member associated with said normally stationary thread guiding means for operating on said needle and looper threads intermediate said spaced points; and driving mechanism for operating said sewing mechanism, feeding mechanism and movable take-up member concurrently.

5. In an overedge sewing machine the combination of a sewing mechanism including a movable needle and at least one looper; feeding mechanism; means for guiding needle and looper threads; a normally stationary puller member for the needle thread; only one movable take-up member associated with said thread guiding means; a two station tension for the needle thread adapted with said take-up member to alter the form of stitch; and driving mechanism for operating said sewing mechanism, feeding mechanism and movable take-up member concurrently.

6. In an overedge sewing machine the combination of sewing mechanism including a movable needle and at least one looper; feeding mechanism; means for guiding needle and looper threads; only one movable take-up member associated with said last named means for operation on said needle and looper threads; a thread nipper; and driving mechanism for operating said sewing mechanism, feeding mechanism, movable take-up member, and nipper concurrently.

7. In an overedge sewing machine the combination of sewing mechanism including a movable needle, and at least one looper; feeding mechanism; means for guiding needle and looper threads; only one movable take-up member associated with said last named means; a trimming mechanism; a nipper actuated by said trimming mechanism; and driving mechanism for operating said sewing, feeding and trimming mechanisms and the take-up member coordinately.

8. In an overedge sewing machine the combination of sewing mechanism including a movable needle, lower looper and an overedge looper; feeding mechanism; means for guiding three threads separately to the needle, lower looper and the overedge looper; only one movable take-up member associated with said last named means; adjustable means adapted to support said threads in divers positions relative to the take-up member; and driving mechanism for operating said sewing mechanism, feeding mechanism and the one movable take-up member concurrently.

9. In an overedge sewing machine the combination of sewing mechanism including a movable needle, lower looper and an overedge looper; feeding mechanism; means for guiding three threads separately to the needle, lower looper and the overedge looper; only one movable take-up member associated with said last named means; a plurality of thread guiding members, shiftable relatively to each other, and each adapted to support one of said threads in various positions relative to each other and relatively to the take-up; and driving mechanism for operating said sewing mechanism, feeding mechanism and the one movable take-up member concurrently.

10. In an overedge sewing machine the combination of a sewing mechanism; an arcuately movable needle carrier in said sewing mechanism; a normally stationary puller member for the needle thread of a substantially arcuate shape adjacent the needle carrier; feeding mechanism; and driving mechanism for operating the sewing and feeding mechanisms.

11. In an overedge sewing machine the combination of a sewing mechanism; an arcuately movable needle carrier in said sewing mechanism; an adjustable puller member of substantially arcuate shape adjacent the needle carrier and movable into different arcuate positions with respect to the arcuate travel of the movable needle carrier; feeding mechanism; and driving mechanism for operating the sewing and feeding mechanisms coordinately.

12. In an overedge sewing machine the combination of sewing mechanism including a movable needle, and at least one looper; feeding mechanism; means for guiding needle and looper threads; only one movable take-up member associated with said last named means; a thread cutter; driving mechanism for operating said sewing mechanism, feeding mechanism and one movable take-up member concurrently; and means for rendering said thread cutter operative concurrently with the operation of the driving mechanism when a knot is present in the thread passing to the sewing mechanism.

13. In an overedge sewing machine the combination of a sewing mechanism; feeding mechanism; a thread control mechanism; a combined knot detector and thread cutter associated with said thread control mechanism; driving means for operating said sewing mechanism and feeding mechanism concurrently; and means for rendering said thread cutter operative concurrently with the operation of the driving mechanism when a knot is present in the thread passing to the sewing mechanism.

14. In an overedge sewing machine the combination of sewing mechanism including a movable needle; an overedge looper in said sewing mechanism, having a thread eye; feeding mechanism; means for guiding needle and looper threads; only one movable take-up member associated with said last named means; means for accurately directing a thread to the eye in the overedge looper when the latter is in a predetermined position; and driving mechanism for operating said sewing mechanism, feeding mechanism and one movable take-up member concurrently.

15. In an overedge sewing machine having a top plate the combination of sewing mechanism including a movable needle; an overedge looper in said sewing mechanism, having a thread eye; feeding mechanism; means for guiding needle and looper threads; means associated with said top plate for accurately directing a thread to the eye in the overedge looper when the latter is in a predetermined position adjacent the top plate; and driving mechanism for operating said sewing mechanism and feeding mechanism concurrently.

16. In an overedge sewing machine the combination of sewing mechanism including a movable needle; a chamber having open and closed positions; a lower looper in said sewing mechanism, having a thread eye; feeding mechanism;

means for guiding needle and looper threads; a slide carried by said chamber adapted to be threaded with the looper thread exteriorly of the chamber and to be moved within the chamber while the chamber is closed; and driving mechanism for operating said sewing mechanism and feeding mechanism concurrently.

17. In an overedge sewing machine the combination of sewing mechanism including a movable needle; a chamber having open and closed positions; a lower looper in said sewing mechanism, having a thread eye; feeding mechanism; means for guiding a thread to the looper from within the chamber, movable from a position outside the closed chamber where it may be threaded to a position within the closed chamber; and driving mechanism for operating said sewing mechanism and feeding mechanism concurrently.

18. In an overedge sewing machine the combination of sewing mechanism; a movable needle carrier in said sewing mechanism; a lower looper; means to facilitate threading the lower looper; an overedge looper; means to facilitate threading the overedge looper; feeding mechanism; means for guiding three threads separately to the needle, lower looper and overedge looper, and for localizing said threads; only one movable take-up member associated with said last named means; a two station tension for the needle thread; a normally stationary puller member for the needle thread; a nipper for one of said looper threads; a knot detector and thread cutter; and driving mechanism for operating the sewing mechanism, feeding mechanism, take-up member, thread cutter, and nipper concurrently.

19. In an overedge sewing machine the combination of sewing mechanism including a movable needle carrier and at least one looper; means to facilitate threading the looper; feeding mechanism; means for guiding threads separately to the needle and to the looper and for localizing said threads; only one movable take-up member associated with said last named means; a two station tension for the needle thread; a normally stationary puller member for the needle thread; a nipper for one of the looper threads; a knot detector and thread cutter; and driving mechanism for operating the sewing mechanism, feeding mechanism, take-up member, thread cutter, and nipper concurrently.

20. In an overedge sewing machine the combination of a thread control mechanism; a split member associated with said thread control mechanism adapted to receive and pass a normal thread, and to effectively prevent passage of the thread when knots and slubs on the thread engage therewith; and means for varying the size of the split member.

21. In an overedge sewing machine the combination of a sewing mechanism including a movable needle and a movable looper; feeding mechanism; normally stationary means, for guiding needle and looper threads at longitudinally spaced points; only one take-up and control member associated with said normally stationary means, provided with apertures for respectively accommodating the needle and looper threads and operating on said threads intermediate said spaced points; and driving mechanism for operating said sewing mechanism, feeding mechanism and one movable take-up and control member concurrently.

22. In an overedge sewing machine the combination of a sewing mechanism including a movable needle and a movable looper; feeding mechanism; means for guiding thread to the needle and to the looper, and provided with passages for the thread; driving mechanism for operating said sewing and feeding mechanism concurrently; a crank arm in said driving mechanism; a take-up and control member actuated by said crank arm for operating on threads to the needle and to the looper; and means for locating said control member in divers positions relative to the arm and to the thread passages in the guiding means.

23. In an overedge sewing machine the combination of a sewing mechanism including a movable needle, and at least one looper; feeding mechanism; normally stationary means, for guiding needle and looper threads at longitudinally spaced points; driving mechanism for operating said sewing mechanism and feeding mechanism concurrently; a crank arm in said driving mechanism; and only one take-up member actuated by said crank arm and associated with said normally stationary means for operating on said needle and looper threads intermediate said spaced points.

24. In an overedge sewing machine the combination of a sewing mechanism including a movable needle and at least one looper; feeding mechanism; means for guiding needle and looper threads; only one movable take-up member associated with said thread guiding means for operating on said needle and looper threads; a two-station tension for the needle thread adapted with said take-up member to alter the form of stitch; and driving mechanism for operating said sewing mechanism, feeding mechanism and movable take-up member concurrently.

25. In an overedge sewing machine the combination of sewing mechanism including a movable needle, and at least one looper; feeding mechanism; means for guiding two threads separately to the needle and the looper; only one movable take-up member associated with said last named means for operating on said needle and looper threads; adjustable means adapted to support said threads in divers positions relative to the take-up member; and driving mechanism for operating said sewing mechanism, feeding mechanism and the one movable take-up member concurrently.

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