Feb. 16, 1960 E. H. CONRAD 2,925,058

ATTACHMENT FOR OVER-LOCK STITCH SEWING MACHINE

Filed May 28, 1958 2 Sheets-Sheet 1

FIG. 1

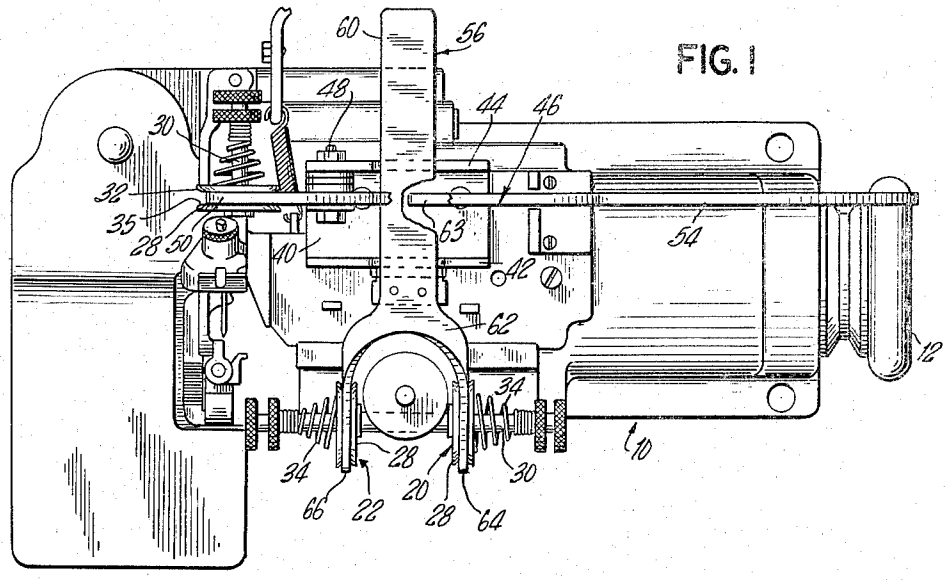
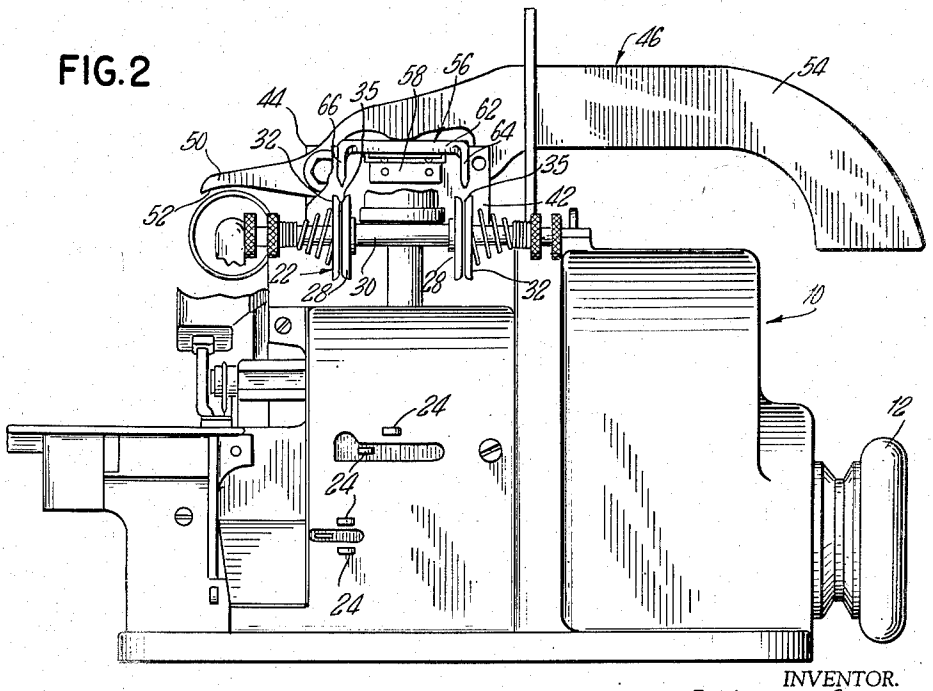


FIG. 2



INVENTOR.
E. HENRY CONRAD

BY

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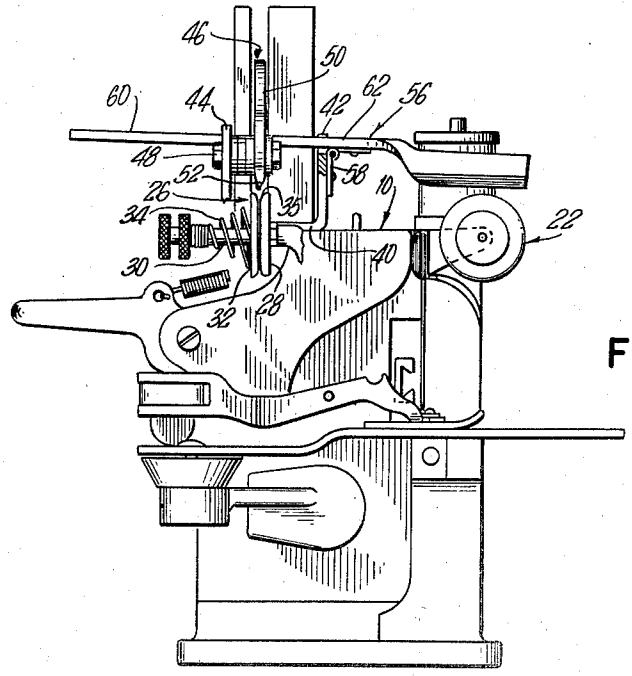
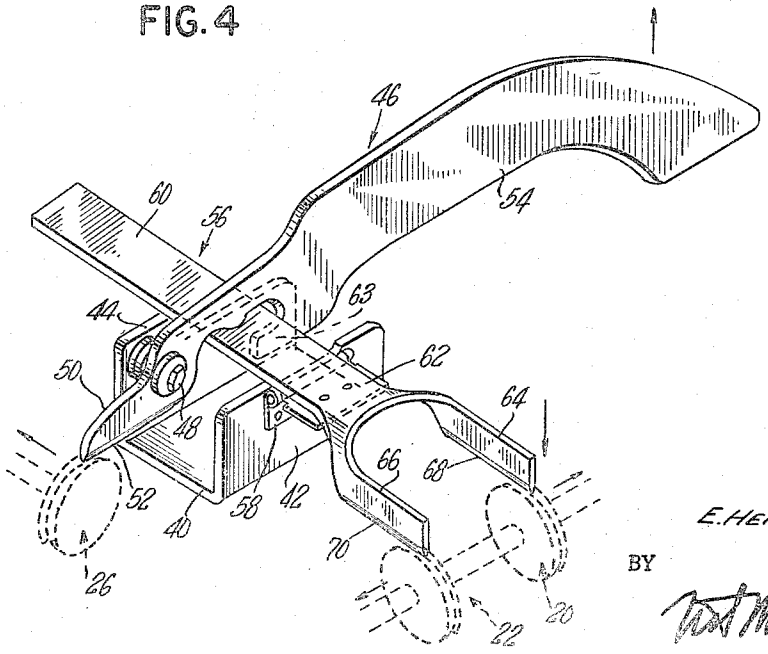


FIG. 3

FIG. 4



INVENTOR.
E. HENRY CONRAD

BY

Wood M. Helfand

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ATTACHMENT FOR OVER-LOCK STITCH SEWING MACHINE

Erich Henry Conrad, Teaneck, N.J.

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14 Claims. (Cl. 112—254)

The present invention relates to a sewing machine and, more specifically, to such sewing machine in which a plurality of threads are fed to or in the direction of the needle from different sides of the machine, as is the case with an overlock-stitch machine, such as the Merrow overlock stitching machine; and is directed to the provision of means associated with or attached to such machine by which the several thread-tensioning devices for the several different threads may be simultaneously loosened, to permit the free and easy drawing out of the several threads from the machine, for the purpose of convenient severance, between the several successive pieces of work produced on the machine.

In sewing machines of the character to which the present invention relates, particularly overlock-stitch machines, a plurality of threads are fed to or towards the needle from at least two sides, namely, the front and a side of the head of the machine. Each of these threads is tensioned, on its way to the needle, by individual tensioning means, generally consisting of a pair of discs, at least one of which is spring-tensioned against the other, between which discs a thread passes. When the stitching or sewing done on such machine is longitudinal in character, so that successive pieces of work are linearly disposed relative to one another, the problem of severing the pieces of work from one another is relatively minor, because, since these successive pieces of work are linearly disposed, they may be continuously processed with intervening blank stitches, in a continuous row, and may be severed from one another at any time after a row of work pieces is completed. However, when the stitching done on the machine is non-linear, as when it comprises, for example, an overlock stitched hem on a circular item, when successive pieces of work do not follow one another in a straight row, but curve back on the work table of the machine, to interfere with the operator's work, it is necessary to provide long spacing sections of thread between the several pieces of work to permit them to move away in a linear direction from the machine, or to sever them conveniently and promptly as they are completed. Heretofore the provision of such long pieces of thread between pieces of work could not be easily effected because it could be done only by the blank running of the machine for a relatively prolonged period of time between the completion of one piece of work and the insertion of the next, or by the manual pulling of the threads. Blank running of the machine is time-wasting. Since the threads are multiple, come from different directions, and each of them is individually tensioned, their pulling is physically very difficult and also requires a substantial interval of time.

The object of the present invention is to provide means, in association with a sewing machine of the character described, for relieving the tension on the threads, to permit their easy drawing out to thereby make the provision of spacing thread sections between the work physically easier and more rapid.

It is also an object of the present invention to provide,

in association with the machine described, means for relieving the tension on each of the threads fed through the machine simultaneously, by a single movement of the operator's hand, to thereby further facilitate and speed the operation of the machine.

It is another object of the present invention to provide thread-tension-releasing means for sewing machines of the character described comprising a single device or unit which may be in the form of an attachment that can be secured in place upon any already existing sewing machine.

It is a further object of the present invention to provide thread-tension-releasing means or device for sewing machines of the character described which are of relatively simple construction; which may be economically produced and relatively quickly and easily installed; which are simple, easy and convenient to operate and are highly effective and efficient for their purposes.

The foregoing and other objects and advantages of the thread-tension-releasing device of the present invention will become more readily apparent to those skilled in the art from the embodiment thereof shown in the accompanying drawing, in association with an overlock stitch sewing machine, and from the description following. It is to be understood, however, that such embodiment is shown by way of illustration only, to make the principle and practice of the invention more readily comprehensible, and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

Fig. 1 is a top plan view of the head of an overlock-stitch sewing machine with a thread-tension-releasing device of the present invention secured thereon and shown in operating position; and partly broken away to disclose structural details;

Fig. 2 is a front elevational view of the same, with the thread-tension-releasing device shown in normal, non-operating position;

Fig. 3 is an end elevation of the sewing machine head shown in Fig. 1; and

Fig. 4 is a perspective view of the thread-tension-releasing device of the present invention, shown in detached state with the thread-tensioning means indicated diagrammatically in broken lines.

Referring now, in greater detail, to the accompanying drawings, the same show a sewing machine head, including a housing **10**, for the actuating mechanism of the needle and presser foot that is operated by a pulley wheel **12**; individual tensioning means for three threads, two fed toward the needle from the front of the machine, and one fed towards the needle from the table-facing end of the machine. The two tensioning means for the front-fed threads are generally designated as **20** and **22**, and have associated thread guides **24**. The tensioning means on the work table end of the machine is generally designated as **26**.

Each of the tensioning means **20**, **22** and **26** consists of a first disc, **28**, mounted in fixed position on a horizontally disposed shaft, **30**, fitted on the housing **10**, and an associated disc, **32**, slidably mounted on said shaft, and urged towards said fixed disc **28** by an abutting end of a coil spring **34**, fitted about the shaft **30**, whose other end may abut a knurled nut that is threaded on the shaft **30**, for pressure adjustment. Each of the tensioning means discs **28** and **32** is formed with a peripheral flange that flares diagonally outwardly away from that of the other, to provide a groove, **35**.

The device of the present invention is intended to simultaneously separate and space the disc **32** of each of the thread-tensioning means **20**, **22** and **26**, away from its associated fixed disc **28**, so as to release the thread passing between the discs, for easy pulling out from the

machine, for spacing the work, or similar purposes. The device comprises a preferably U-shaped bracket having a base, 40, by which it may be secured to the top of the housing 10, and spaced, upstanding arms, 42 and 44, extending therefrom. A lever, generally designated as 46, is pivotally mounted on one of the bracket arms, as 44, by a pivot pin, 48. The lever 46 is preferably pivoted in off-center position with its shorter arm, 50, which may be provided with a tapered bottom edge, 52, extending forwardly over and in alignment with the groove 35 of the tensioning means 26; the longer arm, 54, of the lever 46 counterbalancing the arm 50 to maintain the lever in normally elevated position above such groove 35.

Pivoted over the edge of the other of the bracket arms 42, in transverse relation to the lever 46, is a second lever, generally designated as 56, which may be secured in place intermediate its ends by a hinge, 58, one leaf of which is secured to the bracket arm 42 and the other secured to the lever 56. One arm, 60, of the lever 56 extends in the direction of the lever 46 and is engaged thereby for simultaneous movement therewith, as by the hook, 63, formed on the underside of its arm 54, which engages under the arm 60 of the lever 56. The other arm, 62, of the lever 56, is formed with a forked end each of whose tines, 64 and 66, is preferably formed with a tapered edge, 68 and 70, respectively, and extend, respectively, over the grooves 35 of thread-tensioning means 20 and 22.

The operation of the thread-tension releasing device of the invention will become apparent from the foregoing description. Normally the lever arm 50 and the tines 64 and 66 are maintained in spaced position relative to the thread-tensioning means 26, 20 and 22, respectively, by the counterbalancing effect of the longer lever arm 54, which may be of sufficient length and weight for the purpose to counter-balance its arm 50, and at the same time press down upon the arm 60 of the lever 56. When it is desired to release tension on the threads passing through the tensioning means, the lever arm 54 is elevated by the operator. This depresses the lever arm 50 into the groove 35 of thread-tensioning means 26, to space its disc 30 away from its disc 28, simultaneously the hook 62 on the lever arm 56 elevates the arm 60 of the lever 56 to depress the tines 64 and 66, at the other end of the lever 56, into the grooves 35 of the thread-tensioning means 20 and 22, respectively, to move their respective discs 30 away from the associated discs 28, to release the tension on the threads passing between them. Release of lever arm 54 will automatically return the device to normal, inoperative position.

This completes the description of the device of the present invention and of the method of its operation. It will be readily apparent that such device is of relatively simple and economical construction; that it may be readily modified with respect to shape and size, to be suitable for use on various types of sewing machines having multiple, differently oriented thread-feeding and tensioning means; and that it may be easily and conveniently installed on such machines. It will also be apparent that such device is easy, simple and convenient to operate and is certain and effective in its operation.

It will be further apparent that numerous variations and modifications in the thread-tension releasing device of the present invention may be made by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth, and without the exercise of any inventive ingenuity. I desire, therefore, to be protected for any and all such variations and modifications that may be made within the spirit of the invention and the scope of the claims hereto appended.

What I claim is:

1. In combination with an overlock-stitch or like sewing machine head, having a plurality of thread-tensioning means, said tensioning means located on different sides of said sewing machine head, and each comprising a pair of parallel, vertically disposed, discs each having an edge portion flaring in a direction opposite to that of the other, to form a groove, and at least one of said discs being slidably mounted and spring-tensioned against the other, of means for releasing said tensioning means comprising a first lever, means pivotally mounting said first lever intermediate its ends on said sewing machine head with one arm thereof overlapping the discs of a thread-tensioning means on one side of said sewing machine head and in alignment with the groove between the flared edges thereof, a second lever, means pivotally mounting said second lever intermediate its ends on said sewing machine head with an arm thereof overlapping the discs of a spring-tensioning means on another side of said sewing machine head and in alignment with the groove between the flared edges thereof, and means interengaging the other arm of said second lever with said first lever for simultaneous movement into the said grooves for spreading said discs away from one another upon the movement of the other arm of said first lever.

2. The combination of claim 1, wherein means are provided for normally maintaining said first lever with its said first arm out of contact with its aligned groove.

3. The combination of claim 1, wherein said first lever has its first named arm disposed above the tensioning means it overlaps and has its other arm of greater weight than said first-named arm thereof, whereby said first-named arm is overbalanced to be maintained out of contact with the groove aligned therewith.

4. The combination of claim 1, wherein said second-named arm of said second lever is interengaged with the second-named arm of said first lever.

5. In combination with a sewing machine head having more than two thread-tensioning means disposed on two adjacent sides of said head and at least two of said tensioning means being on the same side of said head, each of said tensioning means including a pair of parallel discs at least one of which is movable and is spring-tensioned against the other, said discs each having a flared marginal edge portion forming an annular channel with the edge portion of the other disc, of means for simultaneously loosening said tensioning means comprising a first lever, means tiltably supporting said lever intermediate its ends on said machine head pointing to one of said sides on said machine head, a second lever, means tiltably supporting said second lever intermediate its ends at an angle to said first lever, and pointing to the other of said sides, the lever pointing to said side having the two tensioning means having a forked arm, said forked arm supported in position to have its tines each overlapping one of the thread-tensioning means on said side and aligned with the channel thereof, the other of said levers having an arm overlapping the tensioning means on the other side of said sewing machine head and aligned with the channel thereof, means interengaging said levers for simultaneous movement of their channel aligned ends toward and away from the contiguous aligned channel.

6. The combination of claim 5, wherein said first lever and said second lever are interengaged by the other of their arms.

7. The combination of claim 5, including means for normally, automatically maintaining said aligned lever arms in spaced relation to their aligned channels.

8. The combination of claim 5, wherein one of said levers is supported in overbalanced position, to normally maintain its aligned arm away from the contiguous tensioning means channel.

9. The combination of claim 5, wherein said levers are interengaged by the other of their arms and one of said levers has its engaged arm overbalanced to maintain the aligned arms of each of said levers away from the associated aligned tensioning means.

10. In combination with a sewing machine head hav-

ing two thread-tensioning means on one side thereof and another thread-tensioning means on an adjacent side thereof, each of said tensioning means comprising a pair of parallel discs supported on said sewing machine head, at least one of said discs of each pair being slidably spring-tensioned toward the other and each disc of each pair having its marginal edge portion outwardly flared to form a groove with the edge portion of the other, of means for simultaneously spacing said discs from one another to relieve the tension, comprising a U-shaped bracket secured by its bight to the top of said sewing machine head, a lever arm pivoted intermediate its ends on one of said bracket arms with one arm of said lever aligned with the groove of the one tensioning means on one side of said sewing machine head, a second lever pivotally supported intermediate its ends on the other of said bracket arms, said second lever having a forked end each of whose tines is aligned with the groove of one of the tensioning means on the other side of said sewing machine head, a slot formed in the other arm of said first lever, the other arm of said second lever engaged in said slot for simultaneous movement of the two levers into and out of the grooves of said tensioning means for spacing and releasing their discs from and toward one another, and means for normally maintaining said levers with their disc-engaging ends out of contact with said discs.

11. The combination of claim 10, wherein said means for normally maintaining said disc-engaging lever ends out of contact with said discs comprises an overbalancing weight on said other arm of said first lever.

12. A thread-tension releasing attachment for an overlock stitch sewing machine head having thread-tensioning means on each of two adjacent sides thereof, said tensioning means each comprising a pair of parallel discs supported on said sewing machine head with at least one of said discs movably mounted and spring-tensioned against the other, comprising a substantially U-shaped bracket adapted to be secured by the bight thereof to the top of said sewing machine head, a first lever pivotally supported intermediate its ends on one of the arms of the said bracket and a second lever pivotally supported intermediate its ends on the other of the arms of said bracket at substantially right angles to said first lever, and means interengaging said lever for simultaneous tilting in the same direction.

13. The attachment of claim 12, wherein each of said levers is formed with a tensioning means contacting outer arm and are interengaged by their other arms.

14. The attachment of claim 12, wherein said second lever is formed with a forked outer arm, the tines of said arm each adapted to engage against the discs of a separate thread-tensioning means for spacing them apart and is engaged by its other arm on the said first lever.

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