Jan. 31, 1950 W. C. BOYER 2,496,116

THREAD CONTROLLING DEVICE FOR SEWING MACHINES

Filed Feb. 1, 1947

FIG.1.

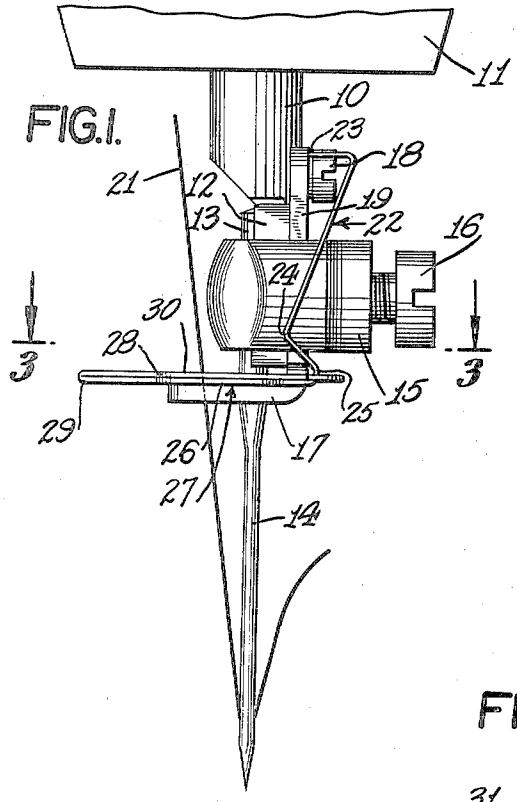


FIG.2.

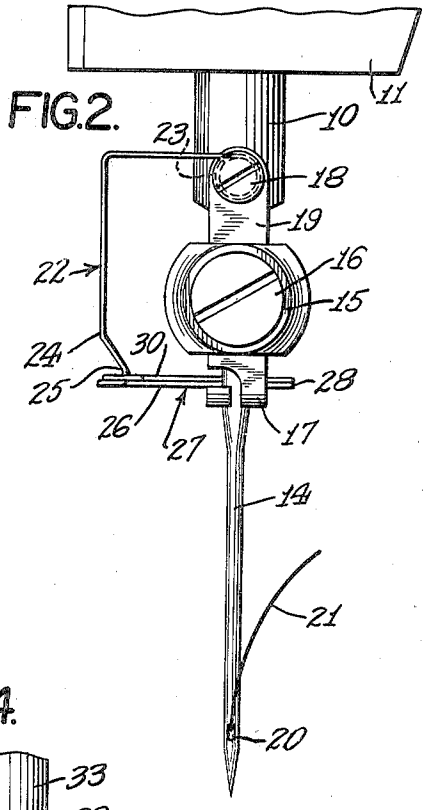


FIG.4.

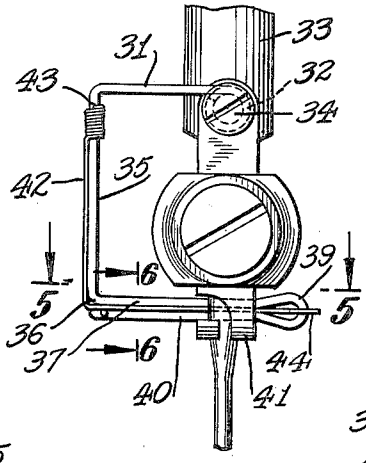


FIG.3.

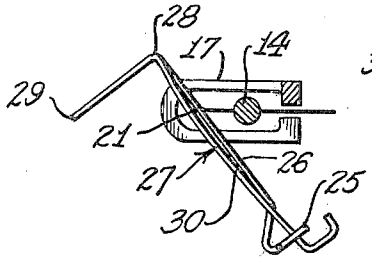


FIG.5.

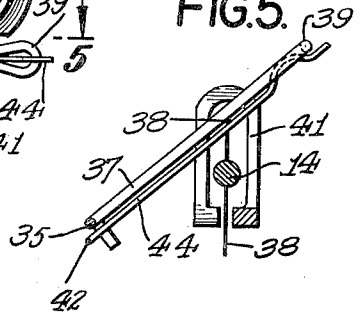
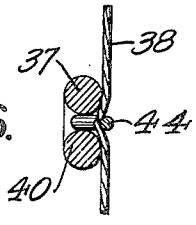


FIG.6.



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Patented Jan. 31, 1950 2,496,116

UNITED STATES PATENT OFFICE

2,496,116

THREAD CONTROLLING DEVICE FOR SEWING MACHINES

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Application February 1, 1947, Serial No. 725,889

5 Claims. (Cl. 112—254)

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This invention relates to sewing with thread made from synthetic organic plastic material or with thread having properties similar to such material, and to a device for enabling such thread to sew properly in a sewing machine.

Among the objects of the invention is to provide an arrangement for controlling a thread during the reciprocating strokes of a needle so as to enable high speed machine sewing. Heretofore difficulties have existed in providing a thread of synthetic organic plastic material with proper sewing characteristics. Thread having physical properties of such material tends to lash about or loop, particularly during the withdrawal of the needle from the material being sewed, with the result that the proper functioning of the shuttle and the forming of satisfactory stitches are impaired. The conditions are aggravated particularly when the sewing is conducted at high speeds, so that proper sewing is ordinarily accomplished at speeds of machine operation below such maximum speeds as can be used for sewing with silk and cotton threads. This is probably because of the high stretchability of synthetic organic plastic material, such as "nylon," as compared with silk and cotton. Effort has been made to improve the sewing characteristics of such material by applying a finishing oil to the thread, but the present invention obviates the need of changing the physical properties and behavior of the synthetic material and accomplishes proper sewing machine performance at high speeds. The object of the invention is accomplished by causing a portion of the thread extending from the eye of the needle on the feeding side of the needle to be held substantially taut as the needle is withdrawn from the material being sewed. This is accomplished by resilient means, such as a spring, which is fastened to move with the needle. The thread is relatively lightly engaged. The device is so constructed and arranged as to offer only moderate or slight restraint to the free passage of the thread to the eye of the needle during the advancing stroke of the needle. During the retracting stroke of the needle the portion of the thread between the spring and eye of the needle is drawn from the material being sewed in a moderately taut condition, and the thread is not permitted to lash about and form undesired loops below the material.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended that the specific description herein be deemed illustrative and that the patent

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shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the particular showing herein to indicate the scope of this invention.

Referring to the drawings, Fig. 1 illustrates a side elevation of an embodiment of the present invention;

Fig. 2 is a view of the device illustrated in Fig. 1 as seen from the right;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 illustrates a modified form of device;

Fig. 5 is a section on line 5—5 of Fig. 4; and

Fig. 6 is an enlarged sectional view on line 6—6 of Fig. 4.

The head of a conventional sewing machine which contains the reciprocating mechanism and guides for the needle bar 10 is illustrated at 11. The needle bar 10 may be of any reciprocatory type. As shown in the drawing, the needle bar has a lower end 12 which is provided with flat sides and a groove for receiving the head end 13 of a needle 14. The needle is clamped in place and fixedly attached to the needle bar by a clamp 15, which is provided with a screw 16 for securing the clamp. The guard 17 is secured to the needle bar 10 by means of a screw 18 and by the clamp 15 through which the shank 19 of the guard passes. The guard extends horizontally and is U-shaped as illustrated in Fig. 3. The needle extends downwardly through the guard. The needle has an eye 20 at its lower end through which the thread 21 is threaded. The thread extends from its source of supply through the guard 17 and to the eye of the needle, and thence into the stitch of the material being sewed on the other side of the needle.

The device 22 by which the thread is engaged between a source of supply and the eye of the needle is constructed and arranged to extend laterally to the needle and to be carried so that it will reciprocate with the needle. As shown in Fig. 1, this device is located above the guard 17 and comprises a spring element in the form of a wire having a loop 23 at its upper end whereby the device is anchored to the needle bar 10 by screw 18. The wire extends laterally from loop 23 and then downwardly with bends at 24 and 25. Bend 25 forms an open loop whose lower end extends to the plane of a horizontally-extending portion 26 which forms one leg of a bifurcated spring element or arm 27. Leg 26 is bent at 28 and again bent at 29 into a reverse bend which extends into the second leg 30 of the bifurcated spring element 27. The free end of leg 30 extends through the open loop 25 which serves as a stop against

the normal flexure of leg 30 when there is no thread disposed between legs 26 and 30.

When the device is in use, the bifurcated arm is so disposed as to extend across the normal path of travel of a thread coming from the source of supply and extending to the eye of the needle, as shown in Figs. 1 and 3. The thread passes between the legs 26 and 30 and is lightly engaged thereby. The engaging action is sufficiently light to allow the thread to be drawn between the legs on the advancing or down stroke of the needle, and to exert sufficient restraint on the thread to prevent the thread from looping or forming slack between the spring device and the eye of the needle during withdrawal of the needle from the material being sewed. Any slack which may occur in the thread extending from the source of supply is localized above the spring during the upward stroke of the needle.

The embodiment of the invention illustrated in Figs. 4, 5 and 6 includes a frame 31 made of wire or other suitable material having sufficient rigidity to maintain its form. One end of the frame is provided with an opening or loop 32 and is firmly secured to the lower end of needle bar 33 by means of a screw 34. The frame has a downwardly extending mid-portion 35 ending at its lower end in a bend 36 which extends into a leg 37 directed to lie adjacent the path of the thread 38, Fig. 5. The leg 37 is bent back on itself at 39 to form a second leg 40 of a bifurcated arm. In this form of device the function of the usual guard 41 may be served by the bifurcated arm of the frame and in that case the guard may be dispensed with, if desired.

A spring 42 is fastened to the frame at one end 43. The spring extends along the mid-portion 35 of the frame and is then bent to provide a free arm 44, which extends parallel to the bifurcated arm and opposite the space between the bifurcation. The spring is so biased as to exert light pressure on the thread travelling between the bifurcated arm and the spring. The device illustrated in Figs. 4, 5 and 6 functions in the same manner as the device previously described.

What is claimed is:

1. As an article of manufacture, a sewing machine attachment comprising a spring element for applying a restraining force to the free passage of a thread between its source of supply and the eye of a needle, said spring element consisting of a wire having a loop at one end which is engageable by a screw for securing the wire to a needle bar of a sewing machine, said wire having a portion thereof extending away from said loop and downwardly of the needle bar to a bend therein which continues the wire into one leg of a bifurcated spring element disposed substantially horizontally and extending transversely of the axis of the needle bar, the wire of said leg continuing into a further bend and providing a length of wire in the plane of said leg which terminates in a U-bend disposed in a substantially vertical plane with the wire continuing from said U-bend into a second length of wire which is parallel to said first-mentioned length and then continues into a bend extending into a second leg in a horizontal plane displaced from the plane of said first-mentioned leg whereby said two legs of the wire constitute a bifurcated spring element with the said legs biased toward each other for engaging a substantially vertically disposed thread therebetween.

2. A sewing machine device comprising a reciprocatory needle bar, a sewing needle, means for securing said needle to said bar, and a wire carried by said bar and constructed and arranged to apply a restraining force to the free passage of a thread between its source of supply and the eye of a needle, said wire comprising a bifurcated spring element providing two legs disposed substantially horizontally and extending transversely of and away from the axis of the needle bar, said legs being disposed in planes one above the other with adjacent portions of the legs in contacting relationship and at least one of said legs being biased to flex cross-wise of the other in scissors-like fashion for engaging a substantially vertically disposed thread therebetween.

3. A sewing machine device comprising a reciprocatory needle bar, a sewing needle, means for securing said needle to said bar, and means carried by said bar and constructed and arranged to apply a restraining force to the free passage of a thread between its source of supply and the eye of a needle, said means comprising a spring wire having a free arm disposed substantially horizontally and extending transversely of and away from the axis of the needle bar and supporting means for the spring wire, said supporting means and said free arm of the spring wire having cooperating portions for engaging a thread therebetween.

4. As an article of manufacture, a sewing machine attachment comprising a spring element consisting of a spring wire having a free arm and means for supporting the wire, said wire being mounted on said supporting means for cooperation therewith for applying a restraining force to the free passage of a thread between said supporting means and said free arm of said spring wire, said supporting means and said free arm of said wire having portions thereof extending in substantially parallel planes and said free arm of said wire being biased for engaging a thread between cooperating portions of said supporting means and said free arm of said spring wire.

5. As an article of manufacture, a sewing machine attachment comprising a frame and a wire spring attached thereto, and means for mounting said attachment to reciprocate with a needle of a sewing machine, said frame and said wire spring each having a free arm substantially parallel to one another for cooperating together to apply a restraining force to the free passage of a thread between its source of supply and the eye of said needle, said frame being relatively stiff and the free arm of said wire spring being biased towards the free arm of said frame for engaging a thread between portions thereof.

WILLIAM CLIFFORD BOYER.

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