

Aug. 8, 1967

M. F. IVANKO

3,334,604

THREAD REPLENISHING MECHANISMS FOR SEWING MACHINES

Filed Jan. 8, 1965

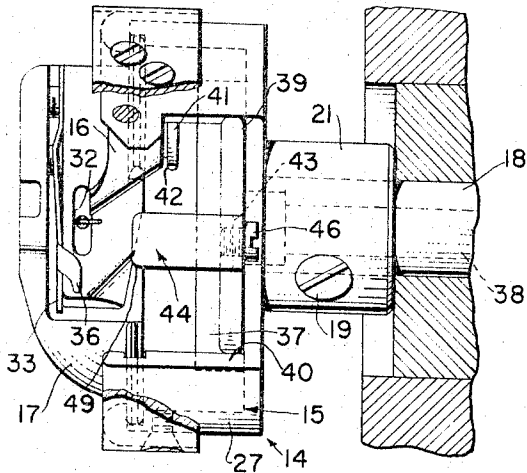


Fig. 1.

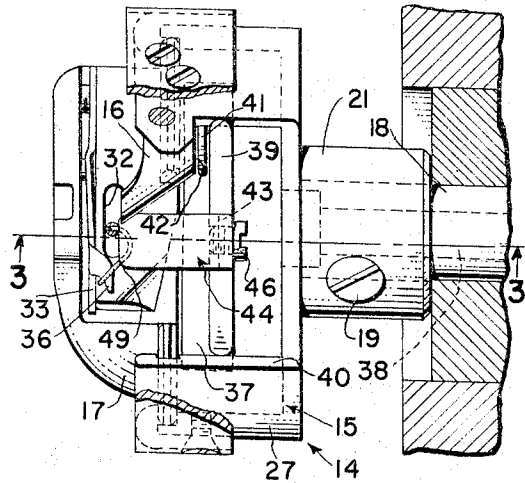


Fig. 2.

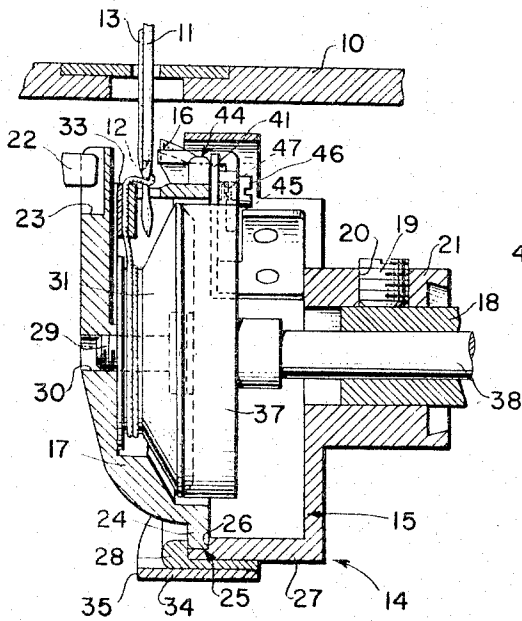


Fig. 3.

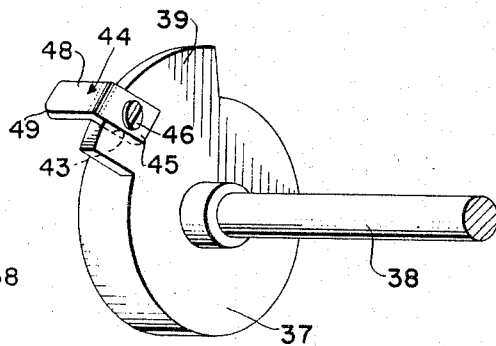


Fig. 4.

WITNESS.

Joseph V. Hill

INVENTOR.

Michael F. Ivanko

BY

Marshall J. Broom
ATTORNEY.

1

2

3,334,604

THREAD REPLENISHING MECHANISMS FOR SEWING MACHINES

Michael F. Ivanko, Rockaway, N.J., assignor to The Singer Company, New York, N.Y., a corporation of New Jersey

Filed Jan. 8, 1965, Ser. No. 424,409
5 Claims. (Cl. 112—181)

ABSTRACT OF THE DISCLOSURE

A finger-like deflector for physically blocking the mouth of a loop-seizing beak on a loop taker during the time when thread is wound on a bobbin in place in the loop taker to prevent the loop-seizing beak from seizing slack thread and attempting to pass it around the bobbin thereby breaking the thread.

This invention relates to thread replenishing mechanisms for sewing machines and more particularly to a loop deflector to prevent a loop-seizing beak from seizing loops of thread when thread is being wound on a bobbin in place in a loop-taker.

While the present invention has utility in any bobbin thread replenishing mechanism in which thread is wound on a bobbin while the bobbin is in place in a loop-taker, the accompanying drawing illustrates the invention embodied in a loop-taker construction of the type disclosed in a United States patent of S. J. Ketterer et al., No. 3,063,392, granted Nov. 13, 1962. In the United States Patent No. 3,063,392, winding of replenishment thread on the bobbin is accomplished by pressing a bobbin driver against the bobbin to rotate the bobbin and deflect a first loop of thread seized from the needle by the loop-seizing beak onto the bobbin instead of allowing it to pass around the bobbin as in the formation of lockstitches. The bobbin driver has a clamping member extending from its periphery to hold the thread against the back of the loop-seizing beak so that thread can be wound on the bobbin as the bobbin is rotated by the bobbin driver. Unless a complicated needle reciprocation throw-out mechanism is provided, during the time that thread is being wound on the bobbin the needle will continue to reciprocate into the work-supporting bed. If the thread should accidentally become slack in the vicinity of the loop-taker, the loop-seizing beak may seize the loop of slack thread and in attempting to pass it around the bobbin would break the thread thus prematurely ending the bobbin thread replenishing operation.

It is, therefore, a primary object of this invention to provide a thread replenishing mechanism with an automatic loop deflector for preventing a loop-seizing beak from interfering with a thread replenishing operation in a loop-taker.

The objects of the invention are accomplished by providing an automatic loop deflector having a finger-like member which physically blocks the mouth of a loop-seizing beak against seizure of loops of thread subsequent to a first loop during a bobbin thread winding operation. The loop deflector is L-shaped with one member fixed in a recess in the back surface of a thread clamping member on the periphery of a bobbin driver and the other member adapted physically to block the mouth of the loop-seizing beak when the bobbin driver is pressed against a bobbin during a bobbin thread winding operation.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing in which:

FIG. 1 is a top plan view of a loop-taker with a bobbin driver and a loop deflector in a retracted position for sewing;

FIG. 2 is a top plan view of the loop-taker of FIG. 1 with the bobbin driver pressed against the bobbin for winding thread on the bobbin and the loop deflector blocking the mouth of the loop-seizing beak;

FIG. 3 is a cross sectional view taken substantially along the line 3—3 in FIG. 2; and

FIG. 4 is a perspective view of the bobbin driver and the loop deflector.

With reference to the drawing, the invention is illustrated as embodied in a sewing machine having a frame of which only a portion of a work-supporting bed 10 is shown. A needle 11 is mounted on the frame in a conventional manner for endwise reciprocation. The needle has an eye 12 adapted to carry thread 13 from a source of thread supply (not shown).

Mounted in the bed to cooperate with the needle to form lockstitches is a loop-taker, indicated generally at 14, of the type disclosed in the aforementioned patent of Ketterer et al., No. 3,063,392. In general, the loop-taker includes a cup-shaped rotating member 15 carrying a loop-seizing beak 16 which rotates around a stationary bobbin case 17. The rotating member is secured to a bed shaft 18 by means of a setscrew 19 screwed into a threaded bore 20 in a hub portion 21 of the rotating member.

The bobbin case 17 is held stationary by means of a lug 22 which is mounted on the frame and extends into a notch 23 in the bobbin case. A bearing rib 24 on the bobbin case mates with a raceway 25 formed by an annular groove 26 in a flange portion 27 of the rotating member 15 and a gib 28 which is removably connected to the rotating member to close the end of the raceway.

Journalled inside the bobbin case 17 on a screw 29 held in a threaded bore 30 in the bobbin case is a bobbin 31. The bobbin case also has a needle aperture 32 and a thread tension spring 33. A thread camming member 34 connected to the rotating member 15 and having a camming edge 35 cooperates with the thread tension spring and a stop member 36 on the thread tension spring at the beginning of each bobbin thread replenishing operation in a manner presently to be described.

The bobbin thread replenishing mechanism includes a bobbin driver 37 fixed on the end of a push rod 38 which is axially shiftable inside the hollow bed shaft 18 and mounted for rotation with the bed shaft. The bobbin driver has a clamping member 39 on its periphery which slides in a gap 40 in the flange portion 27 of the rotating member 15. The clamping member cooperates with a spring 41 which is mounted on the rotating member to clamp thread seized by the loop-seizing beak 16 against the back 42 of the beak during a bobbin thread replenishing operation.

A recess 43 milled in the back surface of the clamping member 39 accommodates an L-shaped finger or loop deflector 44 which has one member 45 fixed in the recess by means of a screw 46 held in a threaded bore 47 in the clamping member. The other member 48 extends finger-like toward the mouth of the loop-seizing beak 16. A curvilinear thread camming surface 49 is formed on the leading edge of the finger-like member.

In operation, during a sewing operation, the bobbin driver 37 remains in its retracted position as shown in FIG. 1 so that the loop-seizing beak 16 can seize loops of thread 13 from the needle 11 and pass them around the bobbin 31 to form lockstitches. When it is desired to replenish thread on the bobbin, approximately 90 degrees of rotation after the loop-seizing beak has seized a loop of thread from the needle the bobbin driver is pressed against the end of the bobbin to rotate the bobbin

and deflect the loop of thread onto the bobbin instead of allowing the loop to pass around the bobbin as in the formation of lockstitches. Simultaneously, the clamping member 39 on the bobbin driver presses the spring 41 against the thread to clamp the thread against the back 42 of the loop-seizing beak so that subsequent rotation of the bobbin by the bobbin driver will wind thread on the bobbin. The camming edge 35 of the thread camming member 34 in cooperation with pull exerted on the thread by the rotation of the bobbin deflects the thread into the thread tension spring 33 where it positions itself against the stop member 36. The loop deflector 44 blocks off the mouth of the loop-seizing beak 16 so that the loop-seizing beak cannot seize any subsequent loop of thread from the needle until the bobbin driver 37 is retracted at the end of the bobbin thread replenishing operation. The curvilinear thread camming surface 49 assists in brushing away slack thread which might become caught on the loop deflector. Thus, a bobbin thread replenishing mechanism has been provided which is capable of winding thread 13 on a bobbin 31 in place in a loop-taker 14 independently of needle reciprocation.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention.

Having thus set forth the nature of the invention, what is claimed herein is:

1. A thread replenishing mechanism for a lockstitch sewing machine having a frame, thread supply means associated with the frame, a needle mounted in the frame for endwise reciprocation and having an eye to carry thread, and a loop-taker mechanism mounted in the frame in cooperative relation with the needle and having means for containing thread and a loop-seizing beak adapted to move in timed relation with the needle to seize loops of thread from the needle to form lockstitches by passing said loops around said means for containing thread, said thread replenishing mechanism comprising means for selectively replenishing thread from the thread supply into said means for containing thread while said means for containing thread is in place in the loop-taker mechanism, and a finger-like deflector means for automatically physically blocking the mouth of the loop-seizing beak against seizure of loops of thread when thread is being replenished in said means for containing thread.

2. A bobbin thread replenishing mechanism for a lockstitch sewing machine having a frame, a thread supply associated with the frame, a needle mounted in the frame for endwise reciprocation and having an eye to carry thread from the thread supply, and a loop-taker mechanism mounted in the frame in cooperative relation with the needle and having a bobbin mounted inside and a loop-seizing beak adapted to move in timed relation with the needle to seize loops of thread from the needle to form lockstitches by passing said loops around said bobbin, said bobbin thread replenishing mechanism comprising means for selectively rotating the bobbin and deflecting a first loop of thread seized by the loop-seizing beak onto the bobbin instead of allowing the loop to pass around the bobbin, means rotating with the bobbin for holding an extremity of thread from the thread supply so that thread can be wound on the bobbin when the bobbin is rotated by said first means, and a finger-like deflector means for automatically physically blocking the mouth of the loop-seizing beak against seizure of loops of thread subsequent to said first loop when thread is being wound on the bobbin.

3. A bobbin thread replenishing mechanism for a lockstitch sewing machine having a frame, a thread sup-

ply associated with the frame, a needle mounted in the frame for endwise reciprocation and having an eye to carry thread from the thread supply, and a loop-taker mechanism mounted in the frame in cooperative relation with the needle and having a bobbin mounted inside and a loop-seizing beak adapted to move in timed relation with the needle to seize loops of thread from the needle to form lockstitches by passing said loops around said bobbin, said bobbin thread replenishing mechanism comprising a bobbin driver selectively axially shiftable against an end of the bobbin to rotate the bobbin and deflect a first loop of thread seized by the loop-seizing beak onto the bobbin instead of allowing the loop to pass around the bobbin, means rotating with the bobbin for holding an extremity of thread from the thread supply so that thread can be wound on the bobbin when the bobbin is rotated by the bobbin driver, and a loop deflector connected to the bobbin driver and shiftable with the bobbin driver physically to block the loop-seizing beak against seizure of loops of thread subsequently to said first loop when thread is being wound on the bobbin.

4. A bobbin thread replenishing mechanism for a lockstitch sewing machine having a frame, a thread supply associated with the frame, a needle mounted in the frame for endwise reciprocation and having an eye to carry thread from the thread supply, and a loop-taker mechanism mounted in the frame in cooperative relation with the needle and having a bobbin mounted inside and a loop-seizing beak adapted to move in timed relation with the needle to seize loops of thread from the needle to form lockstitches by passing said loops around said bobbin, said bobbin thread replenishing mechanism comprising a bobbin driver selectively axially shiftable against an end of the bobbin to rotate the bobbin and deflect a first loop of thread seized by the loop-seizing beak onto the bobbin instead of allowing the loop to pass around the bobbin, a clamping member extending from the periphery of the bobbin driver for holding the thread against the back of the loop-seizing beak so that thread can be wound on the bobbin when the bobbin is rotated by the bobbin driver, and a finger-like deflector member connected to said clamping member and shiftable with the bobbin driver physically to block the mouth of the loop-seizing beak against seizure of loops of thread subsequent to said first loop when thread is being wound on the bobbin.

5. A bobbin thread replenishing mechanism for a lockstitch sewing machine having a frame, a thread supply associated with the frame, a needle mounted in the frame for endwise reciprocation and having an eye to carry thread from the thread supply, and a loop-taker mechanism mounted in the frame in cooperative relation with needle and having a bobbin mounted inside and a loop-seizing beak adapted to move in timed relation with the needle to seize loops of thread from the needle to form lockstitches by passing said loops around said bobbin, said bobbin thread replenishing mechanism comprising a bobbin driver selectively axially shiftable against an end of the bobbin to rotate the bobbin and deflect a first loop of thread seized by the loop-seizing beak onto the bobbin instead of allowing the loop to pass around the bobbin, a clamping member extending from the periphery of the bobbin driver for holding the thread against the back of the loop-seizing beak so that thread can be wound on the bobbin when the bobbin is rotated by the bobbin driver and having a recess in the back surface, and an L-shaped loop deflector having one member fixed in the recess in the bobbin driver and the other member adapted physically to block the mouth of the loop-seizing beak against seizure of loops of thread subsequent to said first loop when the bobbin driver is shifted to wind thread on the bobbin.

5

6

References Cited

UNITED STATES PATENTS

944,740	12/1909	Madison	-----	112—181	JORDAN FRANKLIN, <i>Primary Examiner.</i>
1,794,255	2/1931	Stephenson	-----	112—181	5 HERBERT F. ROSS, <i>Examiner.</i>
					3,038,429 6/1962 Ketterer et al. ----- 112—186 X
					3,063,392 11/1962 Ketterer ----- 112—181