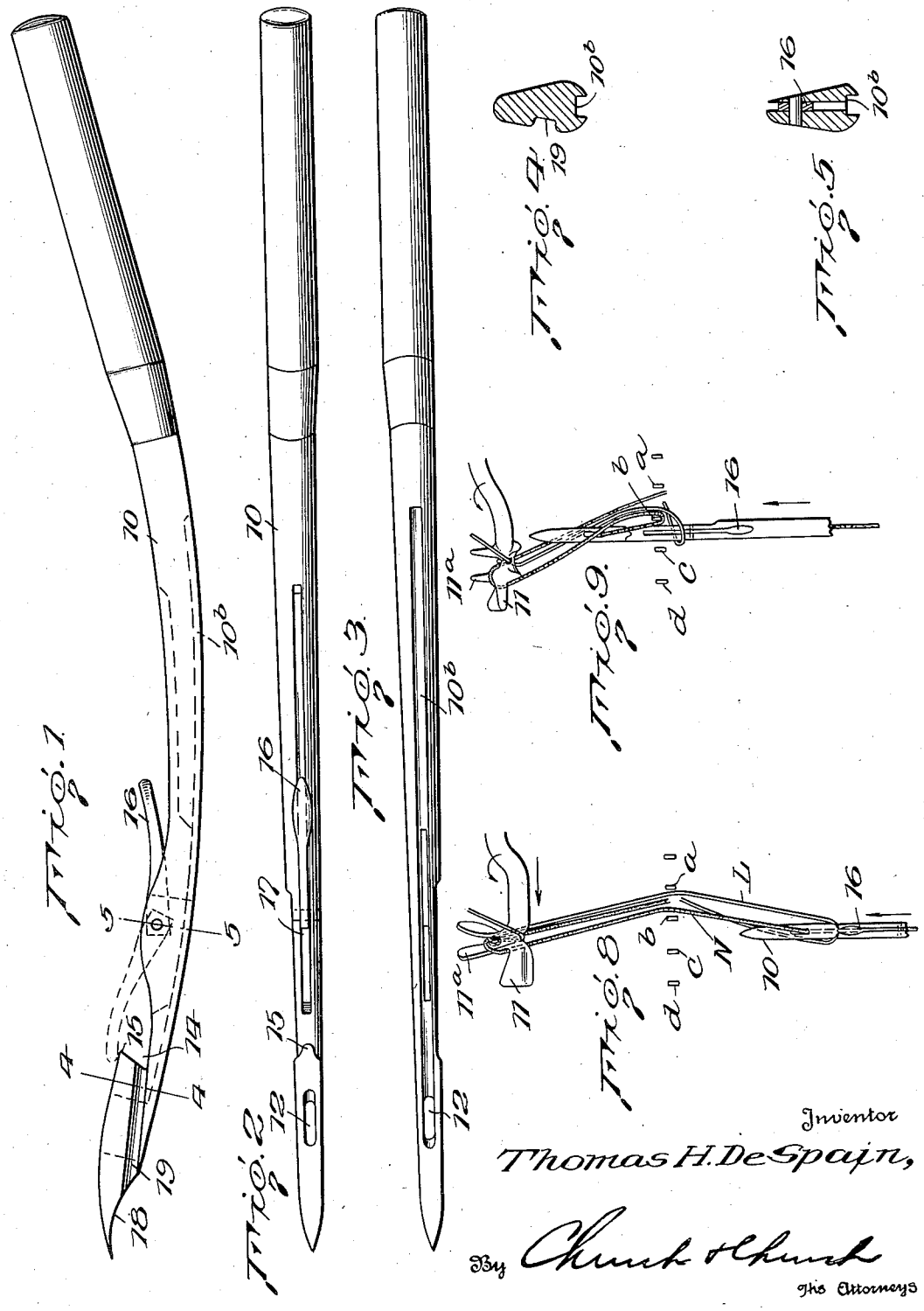
May 19, 1936. T. H. DE SPAIN 2,041,674

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Original Filed Oct. 15, 1934 2 Sheets-Sheet 1



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Fig. 12.

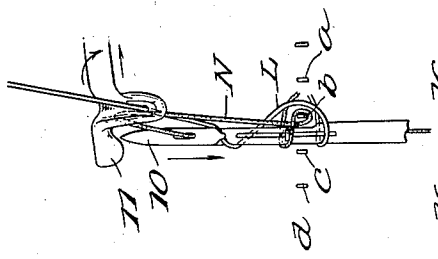


Fig. 6.

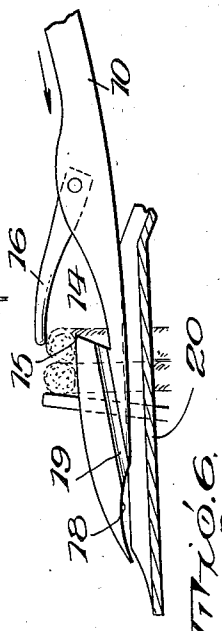


Fig. 7.

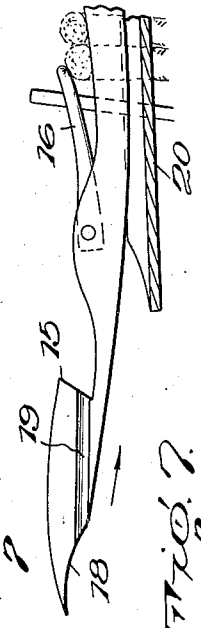


Fig. 11.

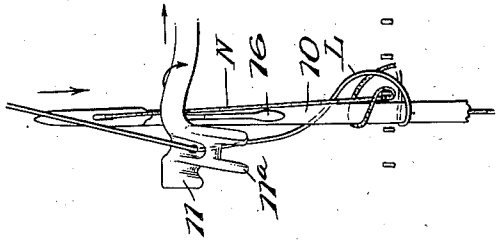


Fig. 13.

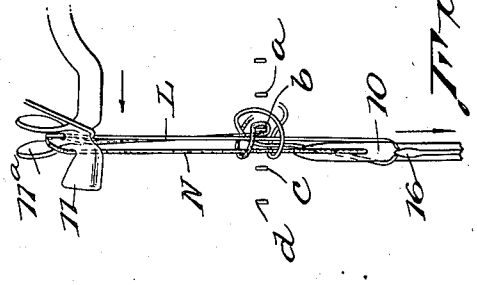
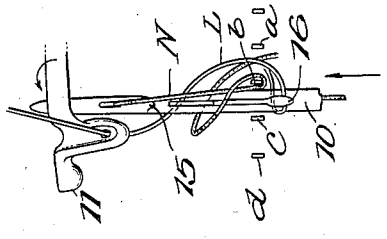


Fig. 10.



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Patented May 19, 1936 2,041,674

UNITED STATES PATENT OFFICE

2,041,674

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Thomas H. De Spain, Paducah, Ky., assignor to Southern Textile Machinery Company, Paducah, Ky., a corporation of Kentucky

Original application October 15, 1934, Serial No. 748,401. Divided and this application February 4, 1935, Serial No. 4,933

3 Claims. (Cl. 112—223)

This invention relates to improvements in sewing needles and particularly to a needle for use in a sewing mechanism wherein two threads are used to form a two-thread interlocking stitch.

More specifically, the present invention contemplates a needle adapted for use in a sewing mechanism of the looper type, i. e., where a needle is used for one thread and a looper device is used for the second thread, but the present needle is so designed that it, alone, penetrates the work. In other words, the present needle is provided with the usual "eye" for its own thread, herein called the needle thread, and with means, preferably a recess or hook, in which the looper thread is caught at one side of the work when the needle penetrates the work and is pulled through the work to the opposite side thereof upon retraction of the needle and released from said hook at said opposite side of the work.

Another object is to provide a needle of this type with means for insuring one side of the loop of looper thread drawn through the work by the needle passing beneath the needle point when the needle is moved laterally, a movement given the needle when retracted, to interlock the two threads at that side of the work.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawings—

Figure 1 is a side elevation, on an enlarged scale, of a needle embodying the present invention;

Fig. 2 is a top plan view;

Fig. 3 is a bottom plan view;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 1;

Fig. 6 is an enlarged view illustrating the needle entering the work, the needle being shown in elevation;

Fig. 7 is a similar view illustrating the retractive movement of the needle; and

Figs. 8 to 13 constitute a series of views illustrating various positions of the needle during a complete cycle of movements.

As above indicated the present needle is especially adapted for use in a sewing mechanism where two threads are used in forming a series of interlocking stitches. In the present instance, one thread is shown at "N", and the other at "L", the thread "N" being threaded through the needle 10 and, therefore, called the needle thread and the other, "L", called the looper thread, through the looper 11.

Near its point, the needle 10 is formed with the usual eye 12 for the needle thread and adjacent the eye it is provided with a recess 14 preferably undercut to form a hook 15. Pivoted in the shank of the needle is a latch 16 which, in one position, is adapted to close recess 14 with its tip extending over hook 15 (Fig. 6) and which, in its other position is adapted to rest on the needle shank as illustrated in Figs. 1 and 2, leaving the recess fully open. If desired, the needle shank may be slotted as at 17 to accommodate the latch.

In operation, the needle is adapted to engage a loop of the looper thread at one side of the work, and carry it through the work, after which the said loop is dropped from the needle, all as will later be described in detail. Before said loop is dropped, however, it is essential that one side of said loop pass under the needle point. To insure such action, the needle point is cut away or formed with an undercut, as at 18, and extending from said undercut to the recess 14 is a guide in the form of a groove 19 in the side surface of the needle.

The purpose of this peculiar needle construction will be better understood by a description of a cycle of operations of the needle and for this reason, reference is made to Figs. 8 to 13, wherein the formation of a two-thread interlocking stitch is illustrated, together with the several positions occupied by the looper and needle. The present invention is fully disclosed in connection with a dial looper in applicant's copending application, Serial No. 748,401, filed October 15, 1934, of which the present application is a division, and reference is made to said pending case for one form of operating connections for the sewing instrumentalities. For present purposes, it is deemed sufficient to simply describe the movements of the needle and looper, to which the threads are fed from a source of supply through suitable guide means. With the needle and looper in the positions shown in Fig. 8, said members are actuated as follows: Needle 10, as indicated by the arrow, is advanced along a work point 20 (see Fig. 6) between jacks "b" and "c" and after passing through the loops of fabric on said point, it is projected through a loop of needle thread which, at that time, is held on a hook 11a of the looper (Fig. 9), having been deposited on said looper hook in the previous cycle of operations. This forward motion of the needle is carried to the point illustrated in Fig. 10 and, due to the rotation of the looper 11, in the direction of the arrow

in Figs. 8 to 10, the loop of needle thread is dropped off the looper and deposited around the needle shank. After this has been accomplished, the direction of movement of the needle and looper are reversed, as indicated by the arrows in Fig. 11. In other words, as the needle is retracted, the looper is rotated in an opposite direction and also moved laterally so as to lay a loop of looper thread over and around the needle. This loop of looper thread is caught in the recess 14 of the needle and drawn through the work as illustrated in Figs. 12 and 13. The timing of the several parts is also such that, immediately after the loop of looper thread has been laid around the needle, the looper picks off from the needle a loop of needle thread, as shown in Fig. 12, so that when the parts again reach the positions shown in Fig. 8, there is a loop of needle thread held on the looper to be placed around the needle on the next advance movement of said needle. After the looper has picked off, so to speak, the loop of needle thread from the needle, its movement laterally of the needle is again reversed, as indicated in Fig. 13, so that when the needle is again advanced through the work the loop of needle thread on the looper will be so positioned with respect to the needle that the needle point will be projected therethrough, as shown in Fig. 10.

When the needle has been retracted it, also, is given a step-over or lateral movement so that, when advanced again, it will enter between jacks "*c*" and "*d*". This movement is shown in Fig. 8 where the needle has been withdrawn from between jacks "*a*" and "*b*" and will next enter between jacks "*b*" and "*c*" as previously described. During this step-over or lateral movement, it is essential that one side of the loop of looper thread "L" pass beneath the needle point and not over said point. If it should pass over the point, it would go free of the recess 14, and the needle thread would not be passed through the looper thread loop. It is for this reason that the needle point is undercut, as at 18, and formed with the guide or groove 19 in its side. Said groove receives the side portion of the looper thread loop and the undercut 18 facilitates movement of the thread beneath the point as the needle is moved laterally.

As the needle is advanced through the work, the latch 16 is opened by the work, as shown in Fig. 6, in order that the looper thread can move into recess 14, after the loop of said thread has been laid around the needle as described in connection with Fig. 12. This opening of the latch is also necessary to free the loop of looper thread previously engaged in the needle hook. That is, as the latch is opened, the looper thread loop then in the recess is caused to slide along the needle shank by reason of the fact that said loop is held by the work and jacks while the needle continues its advance movement. Said looper thread loop thus clears the opened latch and during the next retraction of the needle, said latch is closed by engagement with the work (Fig. 7). Continued retraction of the needle causes the thus freed looper thread loop to slide over the closed latch and off the needle point as illustrated in Fig. 13. The closed latch, during retraction, also insures retention of loop of looper thread last positioned in recess 14.

It will be understood, especially in view of applicant's copending application, previously referred to, that in the present mechanism the work points and jacks constitute parts of a continuously rotating dial such as are customary in the commercial dial looper machines. It should also be added that the needle may also be formed with an extended guide 10b for the needle thread.

What I claim is:

1. A needle for two-thread sewing mechanisms having an eye therein for a needle thread, a hook for a loop of a second thread, the surface of said needle opposite said hook being concave adjacent the point of the needle to guide one side of said loop across said concave surface when said needle is given a lateral movement whereby the two sides of said loop of second thread are passed laterally of the needle thread at opposite sides of the latter.

2. A needle for two-thread sewing mechanisms having an eye therein for a needle thread, a hook recess in its surface for a loop of a second thread, the surface of said needle opposite said recess being concave, said concave surface merging with the point of the needle, and a guide way in the surface of said needle extending from said recess to said concave surface whereby one side of a loop of said second thread in said recess will be deflected across said concave surface at said opposite side of the needle when said needle is moved laterally.

3. A needle for two-thread sewing mechanisms having an eye extending therethrough for a needle thread, a hook recess in the surface of the needle adjacent one end of said eye and adapted to releasably retain a loop of a second thread, said eye being located between said recess and the point of the needle, the surface of the needle adjacent the other end of said eye being concave, and a guide way in the surface of said needle intermediate said concave surface and recess, said guide way and concave surface directing one side of a thread loop in said recess transversely of said concave surface when the needle is moved laterally, the two sides of the loop of said second thread passing at opposite sides of the needle thread when the needle is moved laterally.

THOMAS H. DE SPAIN.