Oct. 23, 1956 L. H. SURBECK 2,767,670

SELF-THREADING SEWING MACHINE NEEDLES

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FIG. 1.

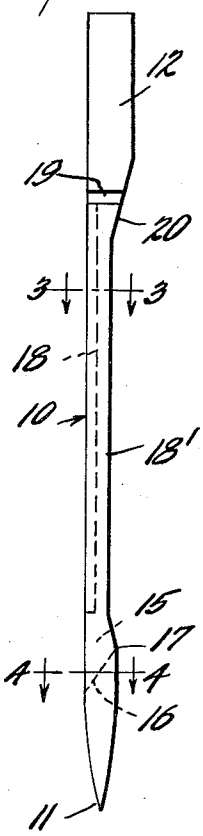


FIG. 2.

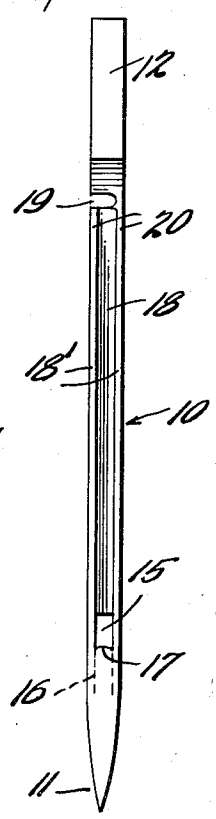


FIG. 3.

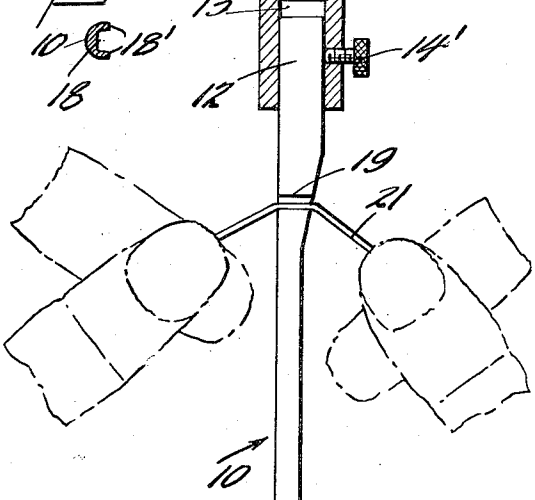


FIG. 5.

FIG. 4.

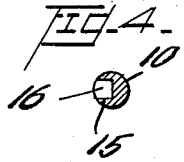


FIG. 6.

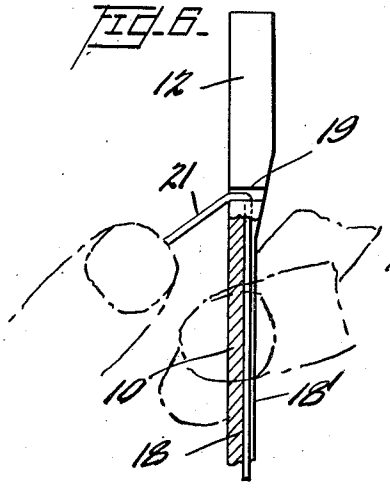
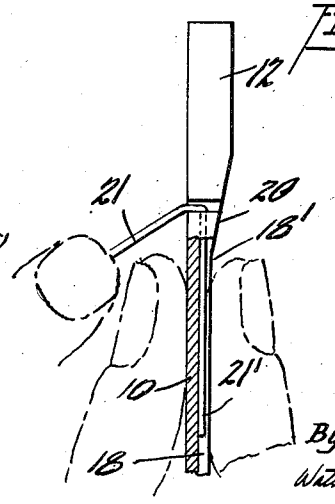


FIG. 7.



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FIG. 8.

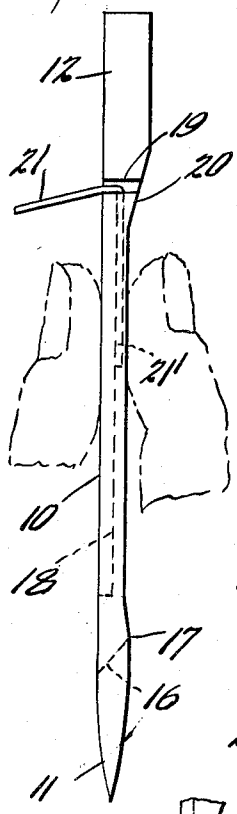


FIG. 9.

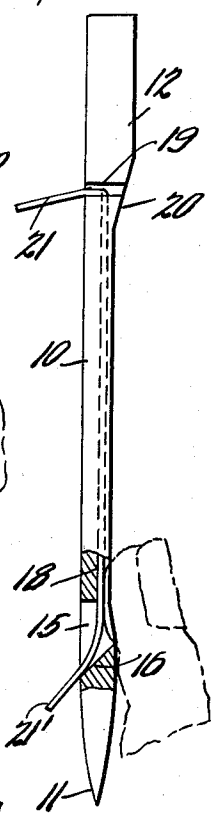


FIG. 10.

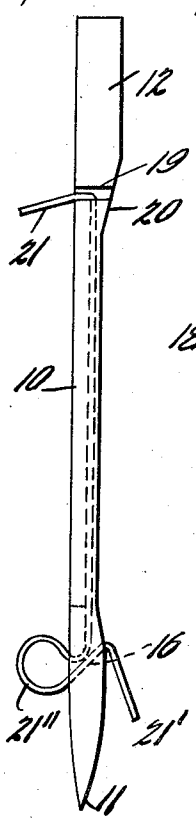


FIG. 11.

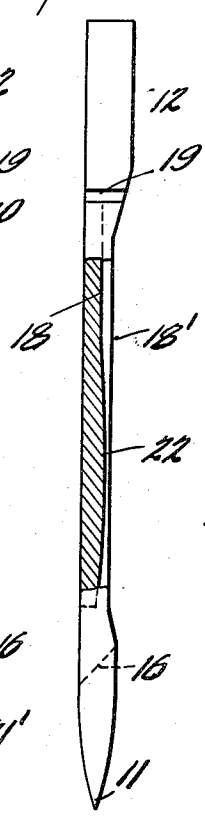


FIG. 12.

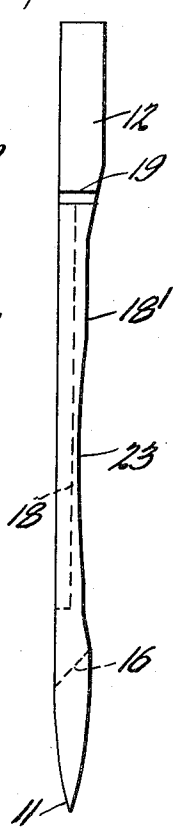


FIG. 13.

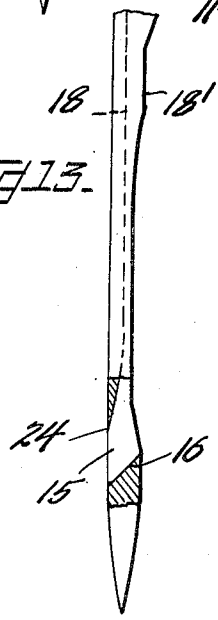


FIG. 14.

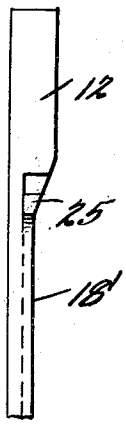
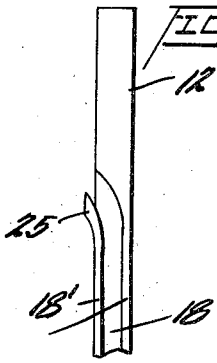


FIG. 15.



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SELF-THREADING SEWING MACHINE NEEDLES

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Application April 26, 1954, Serial No. 425,529

9 Claims. (Cl. 112—224)

This invention relates to sewing machine needles, and more particularly to a self-threading sewing machine needle in which the formation of the needle itself facilitates the threading thereof, eliminating to a considerable extent the eye strain and the other inconveniences occasioned by the necessity of projecting a thread through the eye of the needle in the conventional fashion.

This application is a continuation-in-part of my pending application Serial No. 266,292, filed January 14, 1952, now Patent No. 2,677,485, dated May 4, 1954.

It is the general object of the invention to provide a sewing machine needle comprising a slender shaft provided with a sharp point at one end, the other end being fabricated in the conventional form for attachment to the plunger or reciprocating element of a sewing machine, an eye being provided near the pointed end of the needle as is usual in the case of sewing machine needles. The needle of the present invention is so formed as to facilitate alignment of an end of the thread with the eye of the needle, and also to facilitate projection of the thread end through the said eye.

More specifically, it is an object of the present invention to provide a needle of the class described, that wall of the eye nearest the pointed end of the needle being inclined relative to the axis of the needle, one end of said end wall intersecting the peripheral surface of the shaft at an acute angle, the shaft being formed with a longitudinal groove extending from said eye toward the butt end of the needle, said groove opening into said eye in substantial longitudinal alignment with said acute intersection, whereby a thread may be guided through the eye by introducing the thread into the longitudinal groove and moving it along the groove until the end of the thread impinges the inclined end wall of the eye and, following the latter, is projected through the eye.

A further object is the provision in a needle such as just described, of means near the butt end of the needle for assisting in guiding a thread into said longitudinal groove, which means may consist of a notch extending transversely of the needle and communicating with the longitudinal groove, so that a thread can be first engaged in said notch which will then assist in guiding the thread into and along said groove and thence through the eye, as mentioned above.

Another object is the provision, in a needle of the type described, of a longitudinal groove which, at least throughout a portion of its length, is of lesser depth than the diameter of the thread intended for use with the needle, whereby when the thread is seated in the longitudinal groove, it may be readily engaged by the finger of a user.

Other and further objects, features and advantages will be apparent from the description which follows, taken in connection with the accompanying drawings in which:

Figure 1 is an elevational view of a needle made according to the invention;

Figure 2 is an elevational view taken at 90° to the view of Figure 1;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a section on line 4—4 of Figure 1;

Figure 5 is a view similar to Figure 1, showing the needle secured in the plunger of a sewing machine and illustrating the first step in threading the needle;

Figures 6, 7, 8 and 9 are similar elevational views illustrating successive steps in the threading of the needle;

Figure 10 illustrates an alternative step to that illustrated in Figure 9;

Figures 11 and 12 are views similar to Figure 1, illustrating alternative modifications in the form of the longitudinal groove;

Figure 13 is a fragmentary view partly in section, corresponding to the lower portion of Figure 1 and illustrating a further modification of the longitudinal groove; and

Figures 14 and 15 are partial elevational views of the upper end of the needle, taken at 90° to each other, illustrating a modification of the means of introducing a thread into the longitudinal groove.

In order to facilitate an understanding of the invention, reference is made to the embodiments thereof shown in the accompanying drawings and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

Referring now to Figures 1 and 2, it will be seen that the needle of the present invention comprises generally a slender elongated shaft **10** provided with a sharpened point **11** at the lower end and a rectangular butt portion **12** at its upper end, for seating in a suitable socket **13** in the plunger **14** of a sewing machine (Figure 5).

As in the case of conventional sewing machine needles, the eye **15** is disposed quite near the pointed end of the needle but the eye **15** of the present needle differs in formation from the conventional eye. Thus, the end wall **16** nearest the point **11** is disposed at an angle to the longitudinal axis of the needle, intersecting the peripheral surface thereof at an acute angle, as seen at **17**.

Upwardly or rearwardly of the eye **15**, the shaft **10** is formed with a longitudinal groove **18**, which opens at its lower end into eye **15** at a point in substantial longitudinal alignment with said acute intersection **17**. Opening into the upper or rearward end of the groove **18** is a transverse notch **19**, the depth of which is such as to allow a thread, introduced into the notch, to be guided into the groove **18**.

As will be seen, the notch **19** extends across the full width of the needle which, at that point, is somewhat increased as the cross-section of the needle enlarges toward the butt portion **12**. Thus, the adjacent end portions **20** of the walls **18'** of groove **18** are of increasing height as they approach the notch **19**, which factor assists in location of the thread in the groove **18** by the manipulation now to be described.

Figure 5 illustrates the needle of the present invention, in position in the plunger **14** of a sewing machine, where it is secured by means of a set screw **14'**. The needle is oriented in this view as in Figure 1, with the groove **18** facing to the right and the notch **19** facing in the direction of the viewer. In order to thread the needle, a segment of thread **21** adjacent to one end thereof, is gripped between the thumb and index fingers of the respective hands of the operator, the intervening portion of the thread being engaged in the notch **19**. The operator's right hand is then moved downward as shown in Figure 6 to locate that end of the thread segment in and along the groove **18**, where it is retained by the fingers of the

right hand. The left hand is then moved outwardly to pull the thread end 21' (Figure 7) to a position within the groove 18 and beneath the fingers of the right hand. The right hand is then moved downwardly, a finger frictionally engaging the thread 21, until the end 21' engages the inclined wall 16 of the eye 15 and is projected therethrough, in the position seen in Figure 9. The end 21' can then be grasped and the thread drawn through the eye as far as needed.

Alternatively, if the thread, after being located in the groove 18, is moved downwardly as described, without first locating the end 21' as seen in Figure 8, an intermediate portion of the thread will nevertheless impinge the wall 16 and will be deflected to form the loop 21'' projecting through the eye, as seen in Figure 10, which can then be grasped and pulled as before.

In the modification of the groove 18, illustrated in Figure 11, the bottom wall of the groove is bulged upwardly as at 22 so that the portion of thread overlying the portion 22 of the groove bottom will protrude outwardly beyond the groove walls 18' for ready frictional engagement by the operator's finger.

In the modification of Figure 12, a like result is accomplished by depressing the outer edges of the walls 18' as at 23.

In the embodiment illustrated in Figure 13, the bottom of the groove 18, instead of terminating abruptly to form an end wall of the eye 15, is sloped gradually toward the side of the needle opposite to that on which the groove opens, terminating in a thin edge 24 at the eye 15. In other words, at the point where groove 18 merges with the eye 15, the groove depth extends the full thickness of the needle shaft. This modification increases the certainty of impingement of the thread end 21' against the wall 16, with its resulting projection through the eye.

Figures 14 and 15 illustrate a further modification in which one wall 18' is curved outwardly immediately adjacent the upper end of groove 18 to form projection 25, the notch 19 being omitted in this embodiment. In using this modification, the thread 21 is engaged over the projection 25, instead of in the notch 19, in the first step of threading the needle. Other equivalents of the means for guiding the thread initially into the groove 18 will suggest themselves to one skilled in the art to which the invention relates. Such means, for example, may be separate from the needle and attachable thereto, frictionally or otherwise.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Self-threading sewing machine needle comprising a generally cylindrical shaft having a point at one end and a butt for attachment to the plunger of a sewing machine at the other end, said needle being formed to provide an eye extending therethrough near the pointed end thereof, the end wall of said eye nearest the needle point being continuous and being inclined throughout its length relative to the axis of said shaft, one end of said end wall intersecting the peripheral surface of said shaft at an acute angle, said shaft being formed with a longitudinal groove extending from said eye toward the butt end of said needle, said groove opening into said eye in substantial longitudinal alignment with said acute intersection, said end wall extending from said acute intersection toward the point of said needle.

2. A sewing machine needle as defined in claim 1, the depth of said groove, throughout at least a portion of its length, being less than the diameter of a thread for use with said needle, whereby a thread lying in said groove may be engaged by the finger of a user for moving said thread longitudinally of said groove.

3. A sewing machine needle as defined in claim 2, the floor of said groove being curved longitudinally to vary the depth thereof.

4. A sewing machine needle as defined in claim 2, the upper edges of the walls of said groove being curved longitudinally to vary the depth thereof.

5. A sewing machine needle as defined in claim 1, the depth of said groove increasing gradually throughout a portion thereof adjacent said eye, said groove being deepest at its junction with said eye.

6. A sewing machine needle as defined in claim 1, including means adjacent the butt end of said groove to assist in guiding a thread into said groove.

7. A sewing machine needle as defined in claim 6, said last means taking the form of a transverse notch extending into said needle and into communication with said groove.

8. A sewing machine needle as defined in claim 7, said notch extending through the full thickness of said needle in the direction of the depth of said groove.

9. A sewing machine needle as defined in claim 6, said last means comprising a passage extending transversely of the needle into communication with said groove and means projecting from said needle adjacent the end of said passage to engage a thread and guide it into said passage.

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