

# United States Patent [19]

Ivy

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[45] July 8, 1975

## [54] NEEDLE THREADER

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### Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 274,329, July 24, 1972, abandoned.

[52] U.S. Cl. .... 223/99

[51] Int. Cl. .... D05b 87/00

[58] Field of Search ..... 223/99

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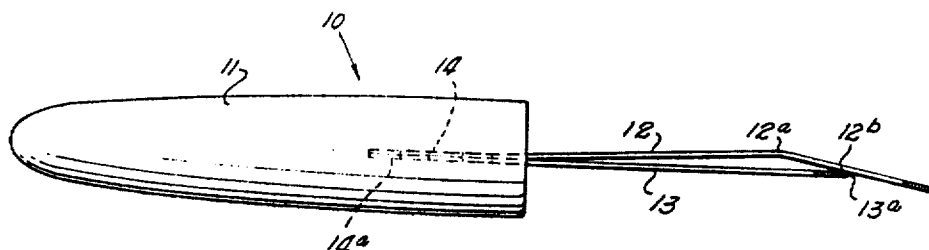
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[57]

### ABSTRACT

A needle threader for pulling particularly bulky thread, such as yarn, through the eye of a needle, including a handle and a pair of slender, leaf-like, flexible members mounted along end portions in the handle and biased together for insertion through a needle eye, gripping a thread, and pulling a section of the thread through the eye. One of the leaf members is longer than the other and includes a bend for holding the needle on the members preliminary to threading and for biasing the members toward each other. One form of the needle threader has leaf members of uniform thickness and width. Another form of the needle threader has leaf members of uniform thickness and graduated width. A further form of the needle threader has leaf members of both graduated thickness and graduated width. A still further form of the needle threader has leaf members of uniform width over a portion of their length and graduated width over the remaining free end portion.

13 Claims, 10 Drawing Figures



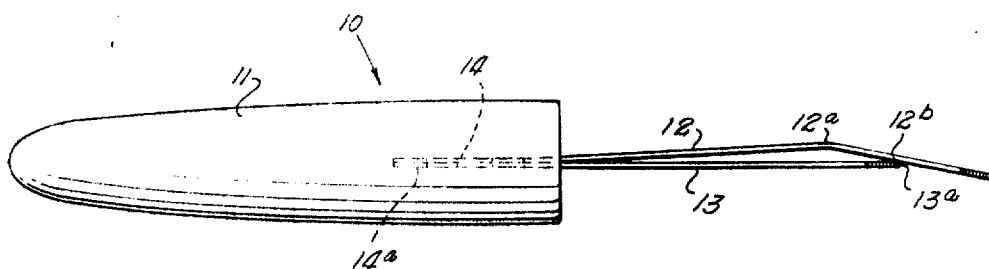


Fig. 1

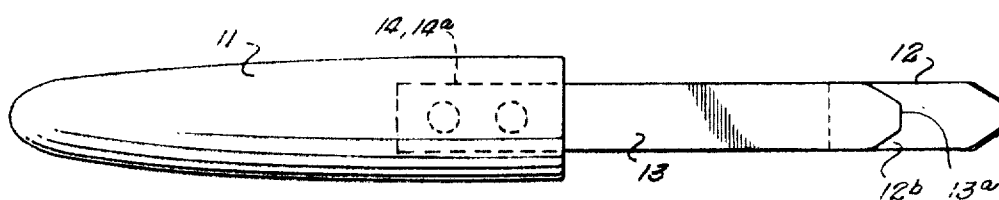


Fig. 2

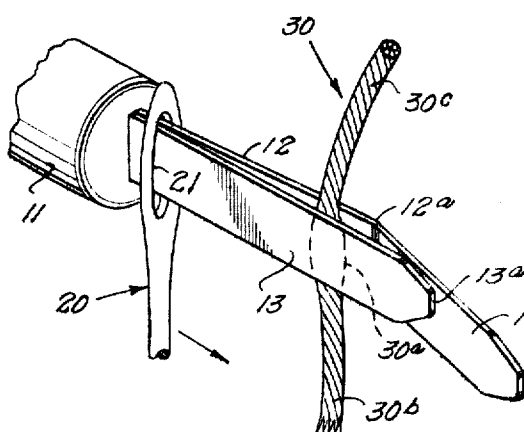


Fig. 3

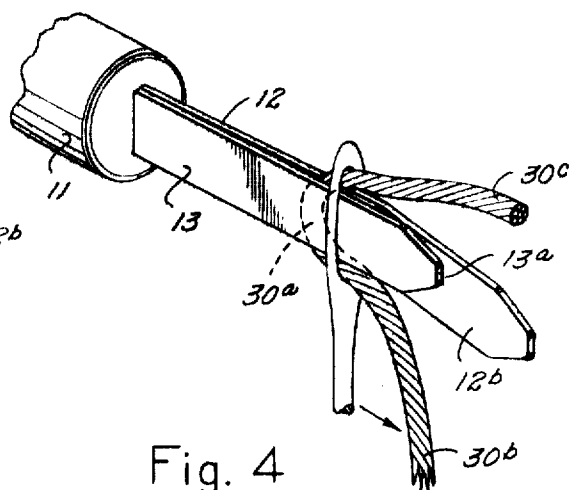


Fig. 4

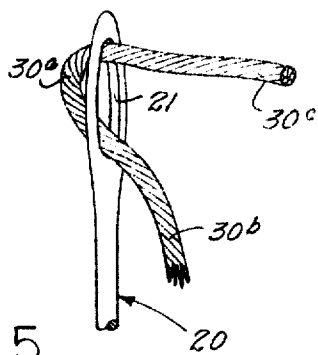


Fig. 5

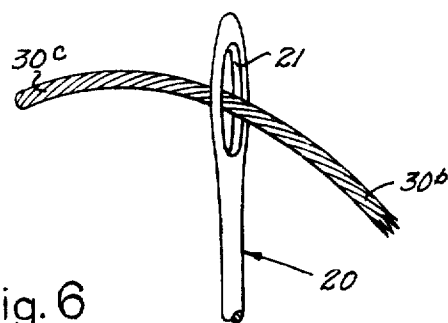


Fig. 6

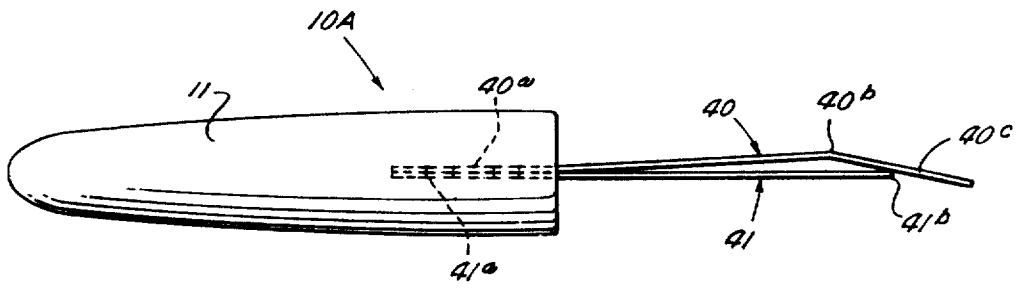


Fig. 7

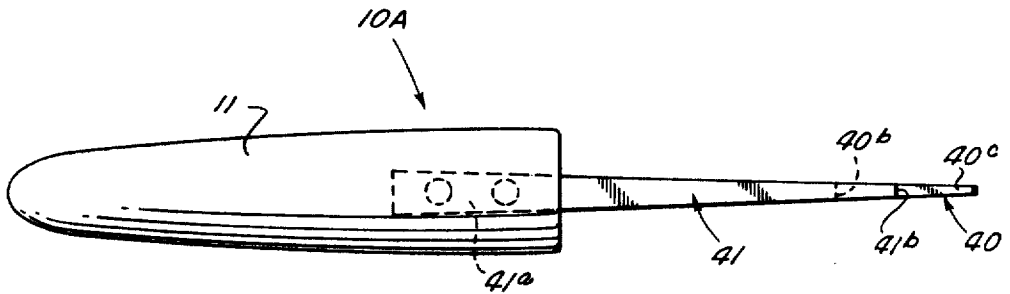


Fig. 8

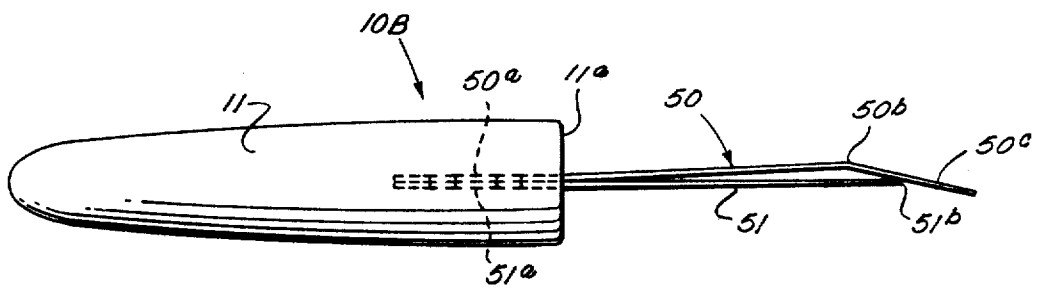


Fig. 9

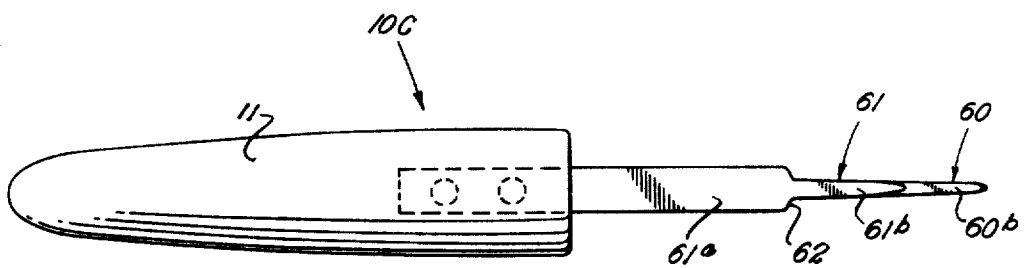


Fig. 10

**NEEDLE THREADER**

This is a continuation in part of application Ser. No. 274,329 filed July 24, 1972, and now abandoned.

This invention relates to sewing apparatus and more particularly relates to needle threaders.

In recent years, handwork of various types has become popular particularly in the areas of decorative work such as the form of embroidery referred to as crewel. In this particular type of handwork, fairly large, loosely formed yarn is used which often presents a problem in threading the yarn through the eye of a needle, especially in the case of a user having a finger manipulation problem, bad eyesight, and the like. Even in cases of persons having excellent eyesight and control of their fingers, problems are presented where the yarn is large in relation to the needle eye through which it is to be threaded. While there are a number of devices for threading needles which are known and commercially available, such devices are not completely satisfactory for threading yarn through a needle eye. Generally, such threaders are formed of small diameter wire bent in the shape of a closed loop which is inserted through the needle eye to grasp the thread and pull back through the eye. Such loop ends on needle threaders are defined by vertically aligned wire portions which are inserted through the needle eye in a single wire thickness relationship since such a closed end bent to a shape which would cause the wire to be pulled through in a double wire thickness relationship would not normally pass through many needle eyes. By having the wire portions of the closed loop vertically aligned, it is, of course, necessary that the thread extend through the loop essentially horizontally, at least at the closed wire loop end where the thread is actually pulled through the needle eye. Such an arrangement is quite satisfactory for threads which are small in diameter relative to the eye of the needle, but are not satisfactory in the case of the heavier yarns which may be difficult to pull through the needle eye in double thickness as is required when pulling it horizontally through by vertically displaced wire portions forming a closed loop end. With one particular yarn and needle, a conventional needle threader could not pull the yarn through the needle eye due to the double thread formed by the closed wire loop end. The same yarn was readily threaded in the same needle by the present invention.

It is a particularly important object of the invention to provide a new and improved needle threader which is especially adapted to pulling heavy yarn through needle eyes.

It is another object of the invention to provide a needle threader which will grasp and pull a yarn segment through a needle eye without folding the yarn to a double diameter thickness as it is pulled through the needle eye.

It is another object of the invention to provide a needle threader which has means for retaining the needle on the threader while engaging the yarn in the threader.

It is another object of the invention to provide a needle threader in which the yarn is easily and quickly engaged with the threader.

It is another object of the invention to provide a needle threader which may be manufactured in a number of sizes to handle assorted sizes of yarn and needle eyes.

It is another object of the invention to provide a needle threader formed of very thin sheet material permit-

ting insertion of the threader members through a very narrow needle eye.

It is another object of the invention to provide a needle threader having thread gripping, leaf-like members of uniform width and thickness over substantially their entire length.

It is another object of the invention to provide a needle threader having leaf-like thread gripping members of uniform thickness and graduated width.

It is a still further object of the invention to provide a needle threader having leaf-like thread gripping members of both graduated thickness and width over their entire length.

It is another object of the invention to provide a needle threader having thread gripping members of uniform width along a base end portion and of reduced graduated width along a free end portion.

In accordance with the invention there is provided a needle threader especially adapted to threading yarn through needle eyes which includes a handle and a pair of thread gripping members formed of narrow, thin, sheet material biased together for insertion through a needle eye and gripping and pulling the thread through the eye. One of the thread engaging members is longer than the other and includes a bend intermediate the opposite ends of the member for biasing the members together and retaining a needle on the members while engaging the thread with the outer end portions of the members. One form of the needle threader has leaf-like thread gripping members of uniform width and thickness over substantially their entire length. Another form of the needle threader has thread gripping members of uniform thickness and graduated width. A further form of the needle threader has thread gripping members of both graduated thickness and graduated width tapering to a point at the free ends of the members. Another form of the needle threader has thread gripping members of uniform width along a base end portion and reduced graduated width along a free end portion.

The foregoing objects and advantages of the invention will be better understood from the following detailed description of a preferred form thereof taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a top plan view of a needle threader embodying the invention;

FIG. 2 is a side view in elevation of the needle threader shown in FIG. 1;

FIG. 3 is a fragmentary perspective view of the needle threader illustrating an early step in the process of threading a needle with the device;

FIG. 4 is a fragmentary perspective view showing the use of the needle threader at a later step in the process of threading a needle with the device;

FIG. 5 is a fragmentary view in perspective of the eye end of a needle and a segment of yarn partially pulled through the eye of the needle with the device of the invention;

FIG. 6 is a fragmentary perspective view of the needle eye end portion and a segment of the thread pulled through the eye in accordance with the invention;

FIG. 7 is a top plan view of another form of needle threader embodying the invention;

FIG. 8 is a side view in elevation of the needle threader shown in FIG. 7;

FIG. 9 is a top plan view of a still further form of needle threader embodying the invention; and

FIG. 10 is a side view in elevation of another form of needle threader embodying the invention.

Referring to the drawings a needle threader 10 embodying the invention includes a handle 11 supporting a pair of thread engaging leaf members 12 and 13. As evident from FIGS. 1 and 2, each of the members 12 and 13 is a relatively long, slender, thin member tapered along a free end portion of the member. The two members are tightly secured together along end portions 14 and 14a embedded to a depth within the handle 11 to firmly hold the members in the handle and together in juxtaposed relationship so that the members will remain biased together along the exposed free portions and will not tend to work loose during use of the device. The handle may be of wood or a suitable plastic molded around the end portions 14 and 14a of the members 12 and 13 with the members being provided with perforations, as evident in FIG. 2, along the embedded portions to enhance the gripping action of the handle on the members.

The leaf members 12 and 13 are preferably formed of a spring-like metal such as steel which may be very strong, very thin, and very resilient to retain the original shapes of the members through many uses and so the members will firmly grip the thread in threading a needle. The member 12 is slightly bent at 12a toward the member 13 intermediate the ends of the members so that a central portion of the member 12 is sprung away from the member 13 due to the engagement of the member 12 at 12b with the free end 13a of the member 13. The cooperative relationship of the bent member 12 with the straight member 13 biases the two members together particularly at the free end of the member 13. The member 12 is substantially longer than the member 13 to facilitate insertion of a thread segment between the members as will be more evident from the description of the operation of the device. The widths of the members 12 and 13 obviously must be less than the length of the smallest needle eye through which the members are to be inserted. The length of the members must be sufficient to permit insertion far enough through a needle eye to allow the members to grip a thread segment and provide the necessary manipulation of the thread to be handled by the members, consistent with lengths which will provide the needed flexibility of the members.

In use the needle threader 10 is held by the fingers of one hand of the user with the short leaf member 13 preferably facing the user. The shank of a needle 20 is held between the thumb and forefinger of the other hand of the user, preferably with the point end of the needle facing downwardly. The needle is rotated to align the eye 21 with the tip end of the leaf member 12. The device 10 is moved toward the eye of the needle inserting the pair of members 12 and 13 through the needle eye until the needle is past the bend 12a of the member 12 and, preferably, is near the handle 11 as shown in FIG. 3. The spacing between the leaf members 12 and 13 at and on opposite sides of the bend 12a in the member 12 provide means for releasably holding the needle 20 on the members since the members along this spaced portion are farther apart than the width of the eye of the needle. Thus, with the members inserted through the needle eye to the location generally represented in FIG. 3, the needle readily remains on the members while manipulating the device for the insertion of the thread. The yarn 30 is then held by the free

hand of the user stretching a portion of the thread vertically between the forefinger of the hand and the thumb and third finger of the hand to provide a short fairly taut vertical segment of the thread for insertion between the members 12 and 13. This portion of the thread is then pressed against the free end portion of the member 12 extending beyond the end 13a of the member 13 so that the member 12 is readily bent slightly away from the member 13 separating the members at the tip 13a. The thread is inserted between the members 12 and 13 until a short segment 30a of the thread section is gripped between the leaf members as seen in FIG. 3. The diameter of the yarn 30 in relation to the lateral spacing between the members 12 and 13 causes the members to frictionally grip and slightly flatten the yarn segment between the members as evident in FIG. 3. Preferably, the yarn segment is inserted between the members beyond the bend 12a of the member 12 for more efficient threading of the needle.

With the needle 20 disposed on the member 12 and 13 and the yarn 30 inserted between the members as shown in FIG. 3, the device is sharply or quickly drawn to the left, as viewed in the drawings, retracting the leaf members 12 and 13 from the needle eye. As the members are drawn from the needle eye and the needle approaches the bend 12a in the member 12 near which the yarn portion 30a is gripped between the members, the members are urged more tightly together, thus pinching the yarn and more firmly frictionally engaging the yarn as the yarn segment 30a is drawn by the members through the needle eye. The stage at which the leaf members are still inserted through the eye and the yarn is partially pulled through the needle eye is represented in FIG. 4. The device is then firmly pulled completely through the needle eye fully withdrawing the leaf members from the eye leaving the yarn partially pulled through the eye as shown in FIG. 5 so that the yarn portion 30a forms a short closed loop on the opposite side of the needle eye from the ends 30b and 30c of the yarn. The yarn loop 30a is of fully adequate size to be gripped by a thumb and forefinger of the user with one of the ends, such as the end 30b, of the yarn being pulled through the needle eye with the result that the needle is now fully threaded. It is to be particularly noted that as seen in FIGS. 4 and 5, and especially emphasized in FIG. 4, as the yarn is pulled through the needle eye only a single thickness of the yarn passes through the needle eye. This is due to the fact that the yarn is held by the flat, inside adjacent faces of the leaf members in a vertical relationship rather than being looped and pulled through horizontally which would present a double thickness of the yarn at the needle eye.

FIGS. 7, 8, and 9 illustrate additional forms of the needle threader which provide increased flexibility for use with varying widths and lengths of needle eyes.

Referring to FIG. 7, an alternate form 10A of the needle threader includes a handle 11 to which are secured leaf-like thread gripping members 40 and 41 which are secured to and embedded in the handle along shank end portions 40a and 41a, respectively. The member 40 is bent at 40b providing the thread gripping end portion 40c. The member 41 is straight so that the tip end 41b engages the inside face of the end portion 40c of the member 40 at about the midpoint of the length of such end portion. The base ends of the members 40 and 41 are secured in contact with each other

along their full inside faces so that the bent end portion 40c springs the members apart, thus causing them to be biased toward each other. The biasing effect maintains the tip 41b against the member portion 40c except when the members are spread apart for the insertion and withdrawal of thread or yarn. In the form of the threader shown in FIG. 7 the thickness of both of the members 40 and 41 is uniform throughout the length of the members. As shown in FIG. 8, however, the widths of both the members 40 and 41 are graduated from the shank ends to semi-pointed configurations at the free ends of the members.

FIG. 9 illustrates a further modified form of 10B of the needle threader which is substantially identical to the needle threader 10A with the added feature of leaf members 50 and 51 which vary in thickness from the shank to the tip ends. The shank end portions 50a and 51a of the thread gripping members 50 and 51 respectively are imbedded in the handle 11 in juxtaposition. As with the other forms of the thread gripping members, the member 50 is bent at 50b providing an end portion 50c extending toward and contacting the free end 51b of the member 51 so that the member 50 is sprung somewhat away from and thus is biased toward the member 51. The members 50 and 51 are tapered in width in the same proportions as the members of the needle threader 10A, and, thus, a side view of the needle threader 10B is identical to the view shown in FIG. 8. The added feature of the threader 10B is that each of the thread gripping members 50 and 51 is graduated in thickness from the handle end of each member to the free or tip end of the member. While it is difficult in a drawing to realistically illustrate the thickness change consistent with the slender shape of the members 50 and 51, there is some thinning of the members as shown in FIG. 9. As a practical matter, a typical example of the proportions of the changes in thickness occurring in the members 50 and 51 is embodied in members which vary from about (0.006) at the shank ends of the members at the handle face 11a to about (0.004) inches at the free tip ends of the members. Thus, the members are each approximately 50 per cent thicker at the handle than at the free tip ends. This graduation in thickness feature accommodates the needle threader 10B more readily to various size needles having varying needle eye widths than the other needle threaders 10 and 10A shown herein. Also, it will be apparent that the width variations in both the needle threaders 10A and 10B provides greater flexibility for use in needles of various eye lengths. The thicker and wider shank portions of the thread gripping members gives them the strength and spring effect required for gripping and pulling threads through needle eyes, while the thinning and narrowing of the thread gripping members embodied in the forms of the threader of both FIGS. 7 and 9 accommodates the threader to a wide variety of eye widths and lengths.

FIG. 10 illustrates a still further form 10c of needle threader embodying the invention. The threader 10c has a handle 11 and thread gripping members 60 and 61 which have shank end portions of uniform width extending from the handle about half the lengths of the members. The members 60 and 61 are then reduced in width and tapered along the other free end portions. More specifically, the member 61 has a shank end portion 61a of uniform width and a free end 61b of substantially reduced tapered width. The longer member

60 similarly has a shank end portion of uniform width and a substantially narrower tapered free end portion 60b. In FIG. 10 the member 61 is superimposed over the member 60 so that most of the member 60 cannot be seen except for the small tip end 60b. The substantial reduction in width of both members occurs at 62. The wide shank portions of the members 60 and 61 gives sufficient strength to grip heavier threads and yarns and pull them through needle eyes. The slender tapered free end portions of the members 60 and 61 allows the threader to be used with small threads in small needle eyes. The members 60 and 61 may be of uniform or tapered thickness and appear in edge views exactly as the threaders 10A and 10B are shown in FIGS. 7 and 9, respectively. The threader 10c is used in the same manner as the other threaders illustrated and described.

What is claimed is:

1. A needle threader comprising a handle; a first thread engaging member secured along one end portion in said handle; a second thread engaging member secured along one end portion in said handle in juxtaposition with said first thread engaging member; said thread engaging members being flat elongated leaves of resilient material and being biased together for frictionally engaging a thread portion therebetween for pulling said thread portion through the eye of a needle; one of said leaves being longer than the other of said leaves and having a free end portion extending outwardly from said handle farther than the free end portion of said other of said leaves; and at least one of said leaves being bent along a line transversely of the longitudinal axis of said leaf providing a free end portion of said leaf converging toward the other of said leaves biasing said leaves together providing means for restraining said needle on said leaves.

2. A needle threader in accordance with claim 1 wherein said first of said leaves having said bend therein is the longest of said leaves.

3. A needle threader in accordance with claim 2 wherein each of said leaves is tapered in width from the shank end to the free end of said leaves.

4. A needle threader in accordance with claim 3 wherein each of said leaves is graduated in thickness from the shank to the tip end of each of said leaves, each leaf being thicker at said shank end.

5. A needle threader in accordance with claim 2 wherein both of said leaves is uniform in width along a first shank end portion and is reduced in width and tapered along a second free end portion.

6. A needle threader comprising: a handle; a first thread engaging leaf secured along a first end portion in said handle; a second thread engaging leaf secured along a first end portion in said handle in juxtaposition with said first leaf; said second leaf being substantially straight and being shorter than said first leaf; said first leaf having a bend therein extending along a line transversely of the longitudinal axis of said leaf aligned between the ends of said second leaf providing a free end portion of said first leaf bent toward and engaging the free end portion of said second leaf whereby said leaves are resiliently biased together for frictionally engaging a thread portion between the inner facing surfaces of said leaves, said leaves being separable for insertion of said thread portion therebetween for frictionally holding said thread portion to pull said thread portion through the eye of a needle; and said bend in said first

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leaf disposing said first and second leaves in spaced relation with each other along a portion of said leaves including and on opposite sides of said bend in said first leaf, said leaves being compressable together to permit insertion through and withdrawal from the eye of said needle whereby said needle is releasably restrained on said leaves and a thread portion is frictionally engaged between said leaves for pulling said thread portion through said eye of said needle.

7. A needle threader in accordance with claim 6 wherein said leaves are disposed to frictionally engage said portion of said thread longitudinally of said eye of said needle whereby said thread portion is pulled through said eye along a single thickness of said thread portion.

8. A needle threader in accordance with claim 7 wherein said thread engaging leaves are comprised of elongated, thin narrow resilient metal sheeting.

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9. A needle threader in accordance with claim 8 wherein said leaves are equal in width.

10. A needle threader in accordance with claim 8 wherein said leaves are tapered in width from the shank end of said leaves to the free tip ends of said leaves.

11. A needle threader in accordance with claim 8 wherein said leaves are tapered in width and thickness from the shank ends of said leaves to the free tip ends of said leaves.

12. A needle threader in accordance with claim 11 wherein said leaves are substantially fifty per cent thicker at said shank end than at said free end.

13. A needle threader in accordance with claim 8 wherein said leaves are uniform in width along a first shank end portion and are reduced in width and tapered along a second free end portion.

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