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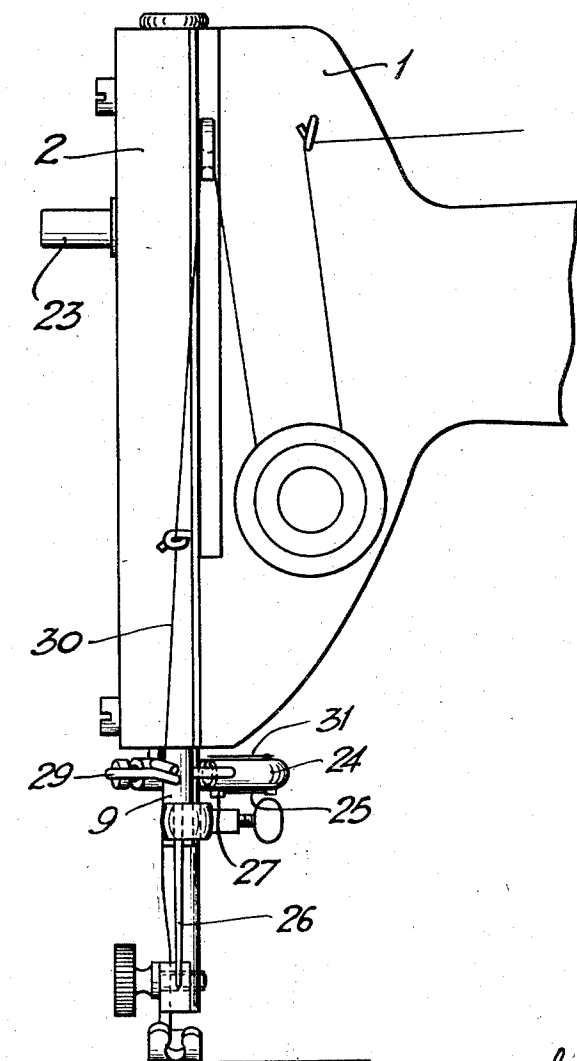
N. R. NAAS
NEEDLE THREADER DEVICE

2,707,448

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Fig. 1.



Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

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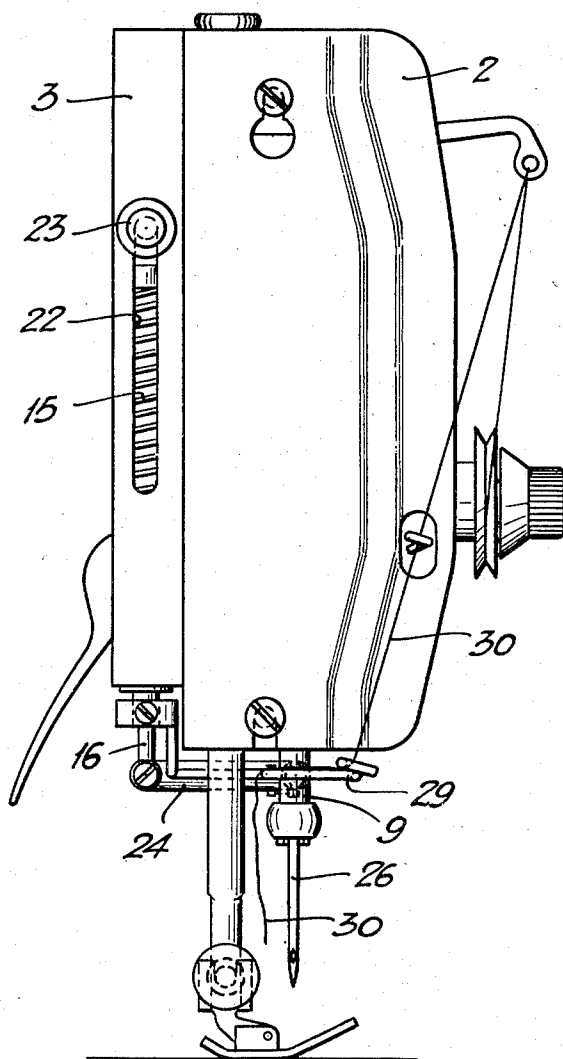
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Fig. 2.



Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

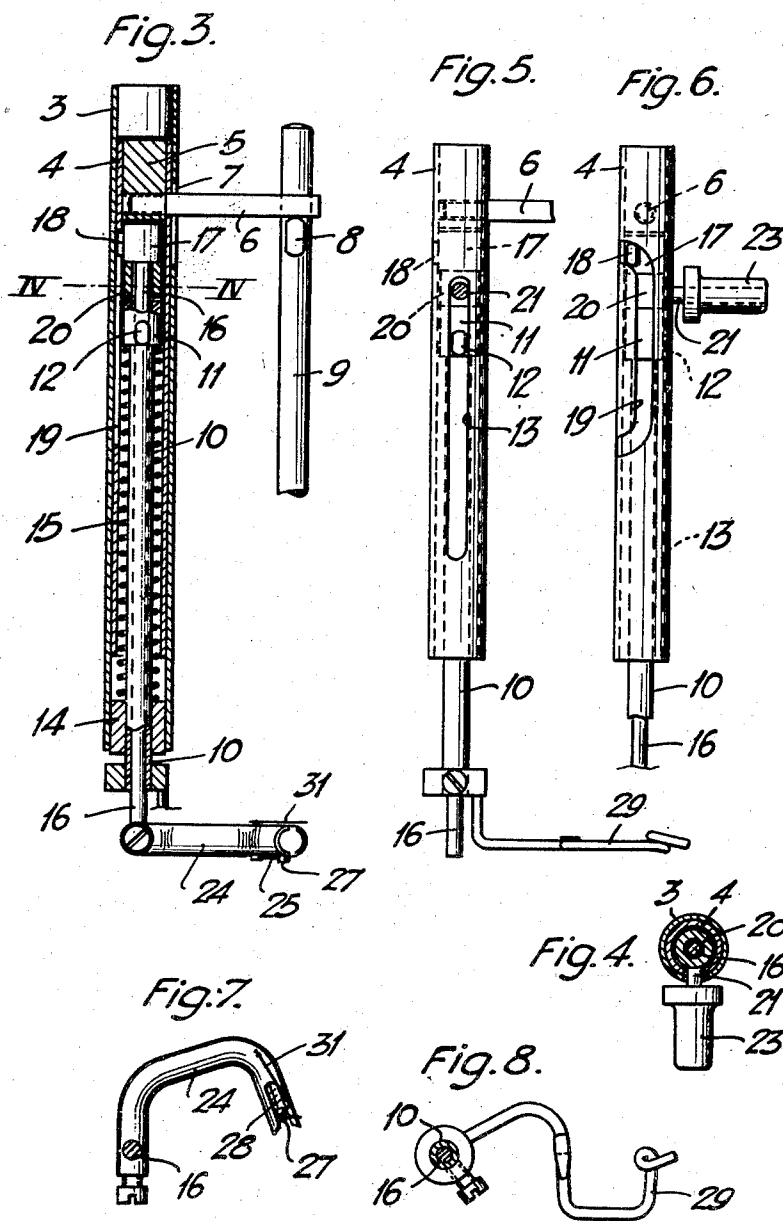
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Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

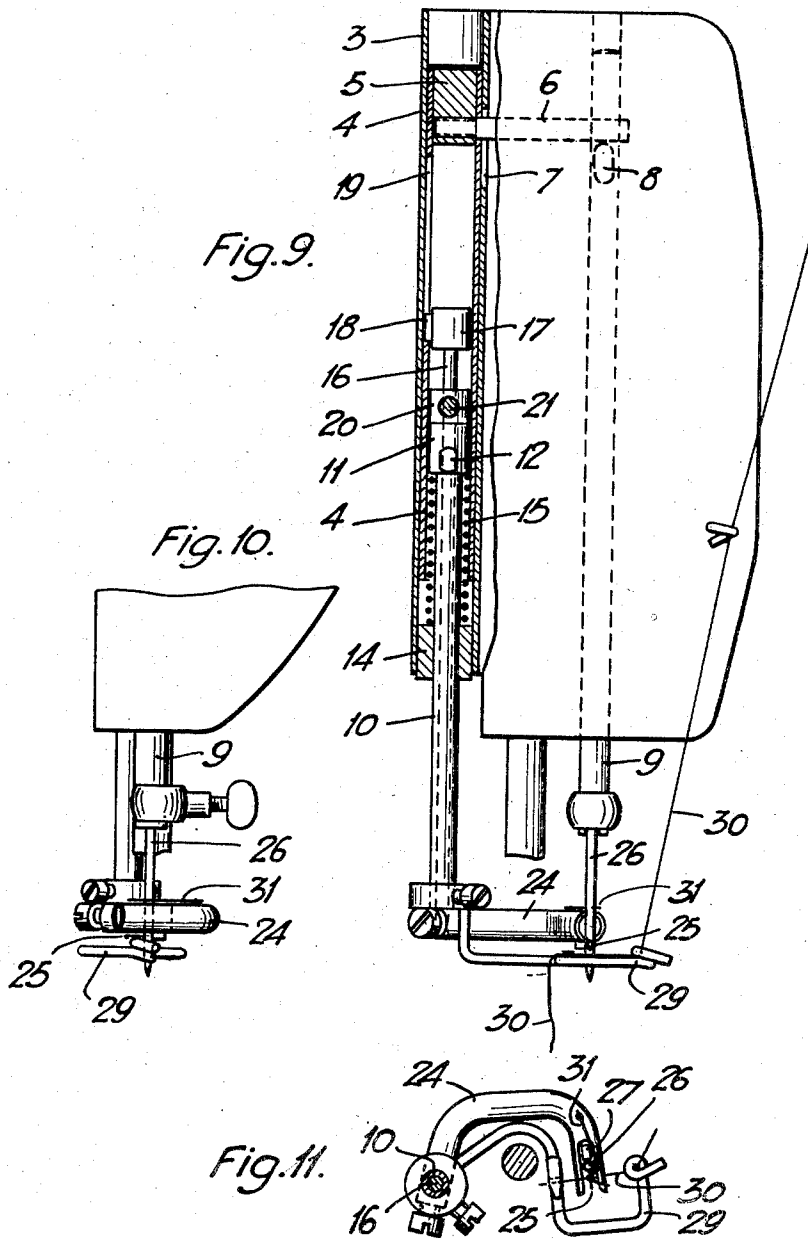
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Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

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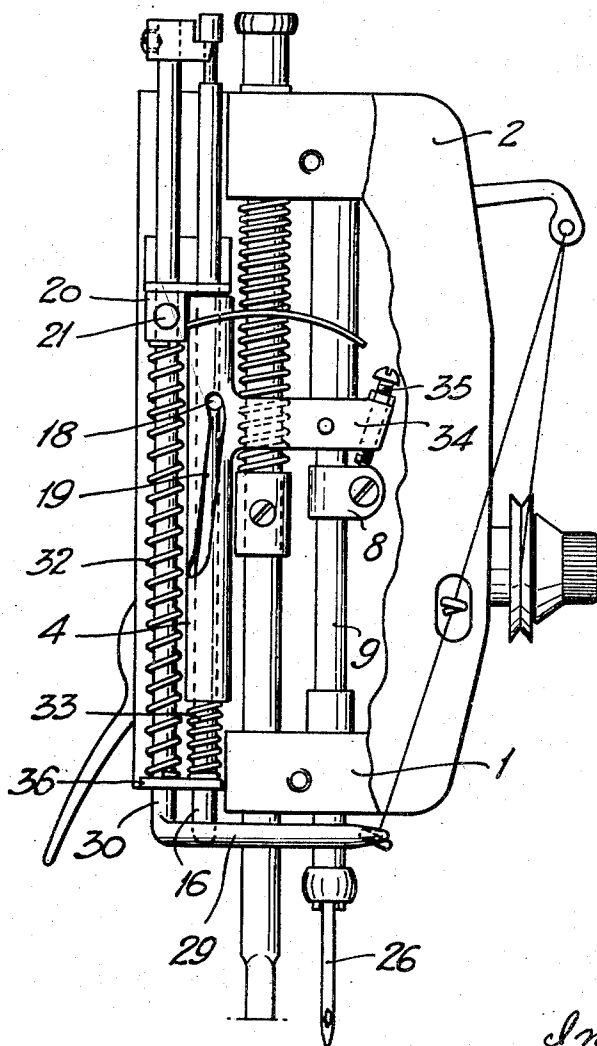
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Fig. 12.



Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

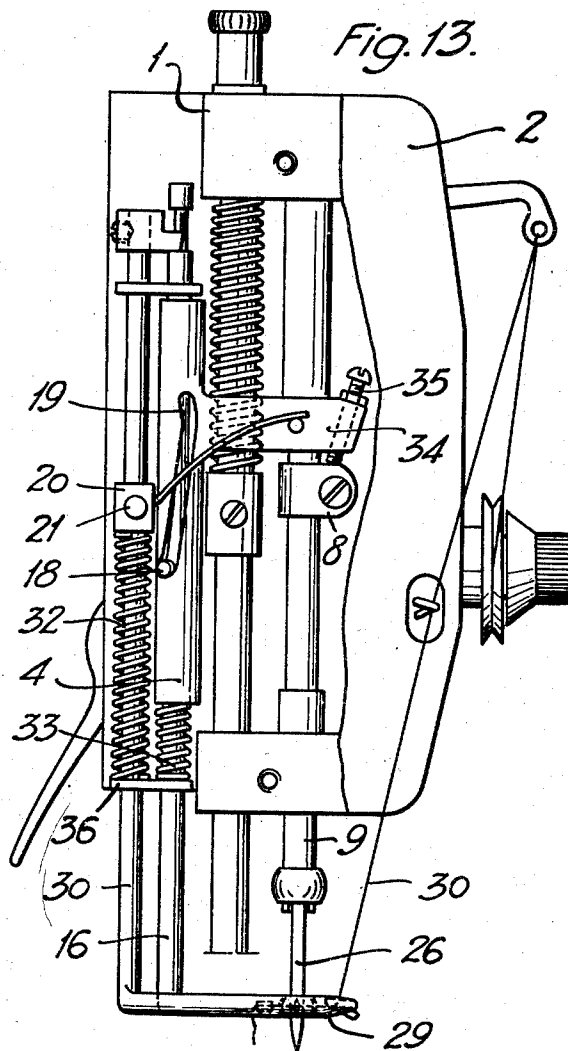
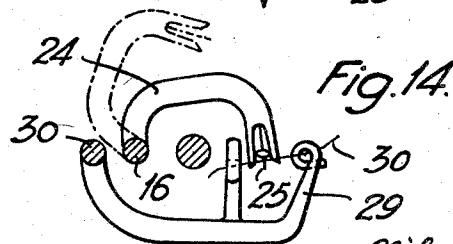
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NEEDLE THREADER DEVICE

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Inventor
Nils Reinhold Naas
by Sommers & Young
Attorneys

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NEEDLE THREADER DEVICE

Nils Reinhold Nääs, Falun, Sweden

Application June 3, 1952, Serial No. 291,507

2 Claims. (Cl. 112—225)

The present invention relates to a needle threader device of the type which consists of a threading member secured in a holder and formed by a thin metal filament or the like provided with a hook shaped end portion adapted by suitable movement of the holder to pass through the needle eye and catch a sewing thread applied in preparatory position, and to return through the needle eye carrying with it the sewing thread.

The main feature of the invention resides in that the holder for the threading member is movably mounted in the sewing machine head in such a way that the threading member, by manual operation, is moved into a position straight in front of the eye of the needle secured in the needle bar and thereupon performs the movement necessary for the threading operation in a plane perpendicular to the longitudinal direction of the needle.

In the drawings two embodiments of the invention are illustrated as example.

Figure 1 is a side elevation of a sewing machine head provided with a needle threader device according to one embodiment of the invention.

Figure 2 is a corresponding end elevation.

Figure 3 is a longitudinal section through an operating and guiding device for the needle threading member.

Figure 4 is a cross section taken on the line IV—IV of Figure 3.

Figures 5 and 6 are different side elevations of detail of the device illustrated in Figure 3.

Figure 7 is a view from above of the holder for the threading member.

Figure 8 is a view from above of a holder for the end portion of the sewing thread.

Figure 9 is an end elevation corresponding to Figure 1 and showing the operating and guiding device in longitudinal section.

Figure 10 is a side elevation of the lower part of Figure 9.

Figure 11 is a view from above of the holders illustrated in Figures 7 and 8 in operative position. Said Figures 1 to 11 illustrate one embodiment of the invention.

Figures 12 and 13 are end elevations corresponding to Figure 2 but showing the threader device according to another embodiment in inoperative and operative position, respectively.

Figure 14 is a detail view of the holders for the threading member and for the end part of the sewing thread.

Reference is at first made to the embodiment first mentioned.

On the end face of a sewing machine head 1 a cover plate 2 is secured by screws, which plate is provided with a casing shaped portion 3, in which a guide bushing 4 is slidably mounted, in the upper end of which a plug 5 is secured, in which a pin 6 is attached, which extends laterally through a slot 7 in the casing shaped portion 3 and over a knob 8 on the needle bar 9. The purpose of said arrangement is as follows. In the guide bushing 4 is a tube 10 provided with a head 11, which is slidably fitted in the bushing 4 and provided with a pin 12 arranged to slide in

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a longitudinal slot 13 in the guide bushing 4. Between the head 11 of the tube and a plug 14 secured in the lower end of the casing shaped portion 3 a helical compression spring 15 is located which tends to raise the head 11 and thereby the tube 10 in upward direction. The tube 10 extends slidably through an aperture in the plug 14, which consequently aids in the guiding of the tube. In the tube 10 is slideably mounted a rod 16, the upper end of which is provided with a head 17, which is slidably mounted in the guide bushing 4 and provided with a side knob 18 engaging a longitudinal slot 19 in the wall of the guide bushing 4, said slot having curved end portions. On the rod 16 below its head 17 is slidably mounted a ring 20 provided with a side pin 21, which extends through the slot 13 in the guide bushing 4 and a corresponding longitudinal slot 22 in the wall of the casing shaped portion 3 and on its other end supports a button 23 for operating the device as explained hereinafter.

The lower end of the rod 16 projects from the tube 10 and a holder 24 for the threading member 25 (Figure 11) is secured on said lower end, said threading member being formed in known manner by a thin metal filament with a hook shaped end adapted to pass through the eye of a sewing machine needle 26. On the threading member 25 is slideably mounted a protecting cage 27 positioned in the forked end of the holder 24 and said cage is pressed by a coil spring 28, so that it tends to take the position shown in Figure 7 in order to cover the end portion of the threading member 25, when this is in non-operating position. On the lower end of the tube 10 a holder 29 for the end of the sewing thread is secured.

The arrangement operates in the following manner.

When the needle 26 is to be threaded the needle bar 9 is brought into or substantially into its uppermost position. Thereupon the button 23 is pressed downwards, whereby the tube 10 is slid downwards, and the rod 16 simultaneously is pushed downwards on account of friction of the tube. When the knob 18, sliding in the slot 19, arrives at the lower curved end of the same the rod 16 is turned, so that the holder 24 of the threading member is swung in clock-wise direction, seen from above, and engages with its forked end the needle 26. The vertical position of the lower end of the slot 19 is such that the threading member 25 by said swinging of the holder is in front of the needle eye. As previously mentioned the needle bar 9 shall take its uppermost position at the threading operation. If, however, on account of deficient carefulness from the operator the needle bar 9 would not be moved exactly to its uppermost position, its knob 18 takes a position a little distance lower in corresponding degree, whereby the guide bushing 4 (which is slidably downwards by its own weight) with the slot 19 will be lowered in the same degree, so that the lower end of the slot nevertheless takes such a position that the threading member 25 at said swinging of the holder 24 is in front of the needle eye and the hook of the threading member passes through the needle, after the spring pressed cage 27 has been pressed back against the pressure of the spring 28 by engagement with the needle and has uncovered the end of the threading member 25. The guide bushing 4 is prevented from rotation by the engagement of the pin 6 in the slot 7. After the rod 16 has reached its lowermost position and the holder 24 has been swung into its operating position, the tube 10 by further pressure on the operating button is further moved a short distance by yielding of spring 15, so that the thread holder 29 is moved to a position below the level of the needle eye, and the thread end, upon raising of the tube 10 together with the thread holder 29 by action of the spring 15 is positioned in the hook of the threading member. Upon further raising of the tube 10 by action of the spring the rod 16 is raised together with the tube, whereupon the ring 20 makes contact with

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the head 17 of the rod 16, and the knob 18 leaves the curved lower end of the slot and moves the holder 24 in counter clock-wise direction as seen from above. By said movement the threading member together with the thread end placed in the hook is drawn back out of the needle eye, whereupon the holder 24 is raised and the needle is passed thereon.

In order that the thread will be surely laid in the hook of the threading member, before the holder 24 is swung in direction from the needle for drawing the threading member out of the needle eye a locking spring 31 is secured at one end on the holder 24, said spring engaging holder 24 and preventing it from performing said swinging movement until the thread holder 29 has been raised such a distance that the thread has been surely attached in the threading member. Only when the rod 16 is positively raised by action of the ring 20 on the rod head 17 the locking spring 31 is released by the positive swinging movement of the holder 24 in direction from the needle as above described.

The embodiment shown in Figures 12 and 13, in which the cover plate 2 is cut away so much that the mechanism in the sewing machine head is visible, differs from the embodiment above described substantially by that the rod 16, which supports the holder 24 of the threading member 25, is not mounted in a tube but directly in the guide bushing 4, which is provided with the longitudinal slot 19, in which the knob 18 on the rod 16 engages for the same purpose as in the first embodiment. The operative button 23 shown in Figures 4 and 6 is omitted, and the pin 21 is secured in the ring. The thread holder is formed at the lower end of a rod 30, which slidably extends through a plate 36 secured on the machine head. Between the plate 36 and the ring 20 is inserted a helical pressure spring 32, and between said plate 31 and the guide bushing 4 is inserted another helical pressure spring 33. Said two springs tend to raise the ring 20 and the guide bushing 4 respectively. The pin 6 extending from the guide bushing 4 in the first embodiment is in Figures 12 and 13 replaced by an arm 34, which extends over the knob 8 on the needle bar 9 and is adapted to bear on the knob 8 in certain position of the bar 9, which position is adjustable by means of a screw 35 which extends through the arm 34, the lower end of said screw being adapted to make contact with the knob 8.

What I claim is:

1. A threading device for sewing machine needles, comprising a sewing machine having a head provided with a substantially vertically disposed, tubular, guide bushing

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fixedly carried thereby, a rod slidable upwardly and downwardly in said bushing, a needle threader holder secured on the lower portion of said rod and extending laterally from said rod to approximately opposite the needle when the needle is in its raised position, a needle threader secured to said holder and formed by a thin metal filament extending substantially tangentially to the axis of said rod, said needle threader being provided with a hook-shaped end portion, said guide bushing being provided with a slot in its tubular wall, extending generally longitudinally of said bushing but deflecting laterally at its lower portion, said rod having a laterally extending projection which engages in said slot of said guide bushing, the lateral deflection of said slot causing said rod to rotate as it moves downwardly with said projection in the laterally deflected portion of said slot and swing the threader into a position in line with and through the needle eye to catch a sewing thread held located beside the needle eye, and, then, upon upward movement of the rod, swings the threader through the return movement necessary for drawing the thread through the needle eye.

2. A device according to claim 1 and in which said slot in said bushing has a closed bottom end, a tube axially slidably mounted in said guide bushing, a stop member carried by said head below said tube in position to be engaged by said tube, the rod, on which the holder for the threader is secured, being rotatably and axially slidably mounted in said tube, said tube on its lower end portion, supporting a holder for the end portion of the sewing thread, manually operable means engaging said tube for sliding said tube axially, the friction between the tube and the rod mounted therein being such that the rod is moved together with the tube, until downward movement of the rod is stopped when said laterally extending projection arrives at the closed bottom end of said slot in said bushing, whereupon the tube is further moved downwardly a short distance to engage and be stopped by said stop member with the sewing thread adjacent the needle eye in position to engage in the hook-shaped end of the needle threader.

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