Jan. 15, 1957 R. BALZER 2,777,623

NEEDLE THREADING DEVICE

Filed Oct. 26, 1953

FIG. 1.

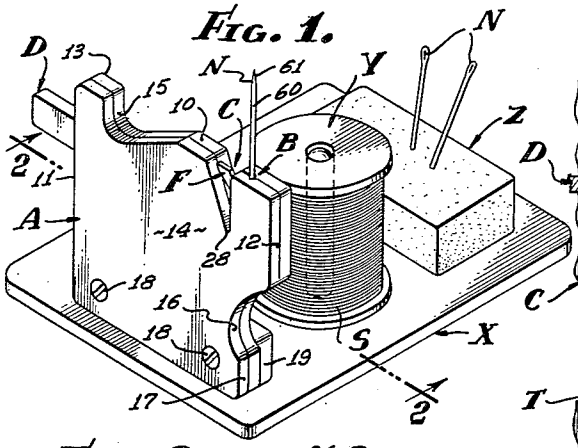


FIG. 6.

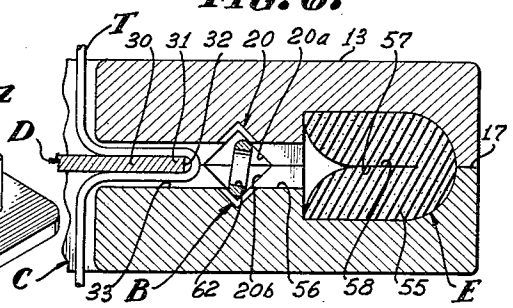


FIG. 7.

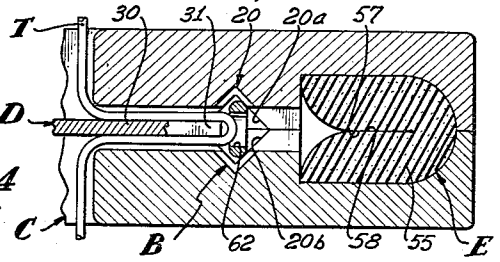


FIG. 2.

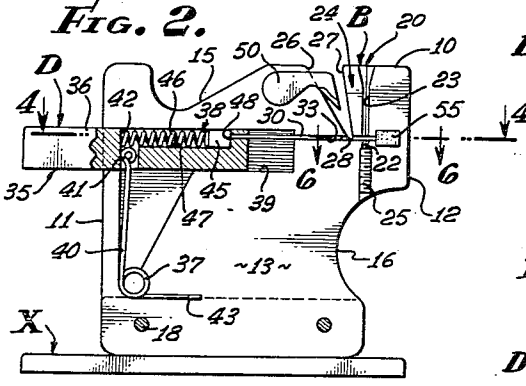


FIG. 8.

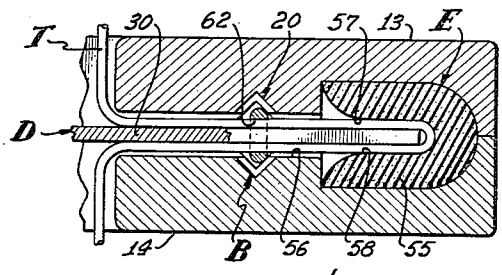


FIG. 3.

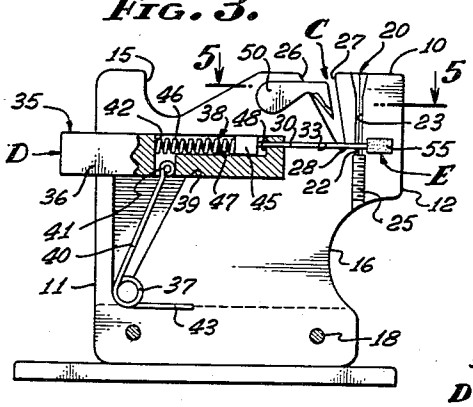


FIG. 10.

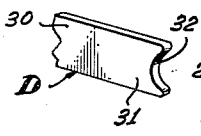


FIG. 9.

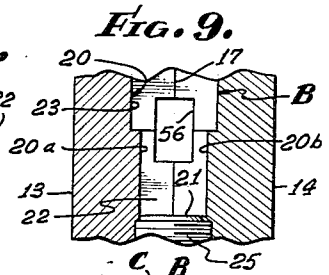


FIG. 4.

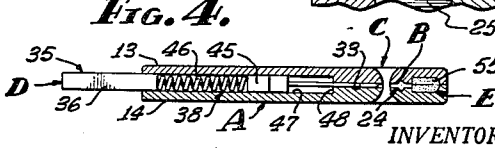
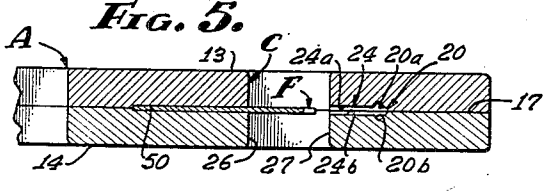


FIG. 5.



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NEEDLE THREADING DEVICE

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Application October 26, 1953, Serial No. 388,368

3 Claims. (Cl. 223—99)

This invention has to do with a needle threading device and it is a general object of this invention to provide a simple, practical, improved needle threader, particularly useful and practical for use by seamstresses and tailors.

The ordinary or usual needle is characterized by an elongate shank sharpened at one end and provided with a head at the other end. Such needles are manufactured in various sizes. However, the needles commonly used for hand sewing are of about the same size and the eyes are located at about the same position in the head.

It is a general object of this invention to provide an article of manufacture operable to aid the threading of common needles, which article is of simple, inexpensive construction and such that it can be quickly, conveniently and effectively used.

Another object of this invention is to provide a device of the character mentioned, which is composed of but few mechanical parts and which is practical for use so that the user can manipulate the device with one hand.

It is an object of this invention to provide a structure of the character referred to which operates to position the needle within the device so that the thread handled thereby is accurately and easily inserted through the eye of the needle, and so that the needle may be withdrawn from the device with the thread applied thereto.

It is a further object of this invention to provide a needle threading device of the character referred to which is completely free of sharp projections or like elements, so that no delicate parts are exposed to damage and so that the hand of the user will not become injured in any way.

It is another object of this invention to provide a needle threading device wherein the actuated parts are housed and protected so that they cannot be damaged in any way during operation of the device.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a perspective view of the needle threader that I have provided. Fig. 2 is an enlarged sectional view taken as indicated by line 2—2 on Fig. 1. Fig. 3 is a view similar to Fig. 2 showing the parts in a different position. Fig. 4 is a plan sectional view taken as indicated by line 4—4 on Fig. 2. Fig. 5 is an enlarged detailed sectional view taken as indicated by line 5—5 on Fig. 3. Fig. 6 is an enlarged detailed sectional view taken as indicated by line 6—6 on Fig. 2. Figs. 7 and 8 are views similar to Fig. 6, showing the parts in different operative positions. Fig. 9 is an enlarged detailed vertical sectional view taken transversely of the body and showing the needle receiving means that I have provided, and Fig. 10 is an enlarged perspective view of the plunger that I have provided for engaging the thread.

The device or structure that I have provided is useful generally for the threading of common needles. However, it can be used to great advantage in threading the smaller sizes of needles. In the drawings, a needle N is shown and is adapted to be received by the threading device that I have provided. The needle is shown as involving an elongate shank **60** with a sharpened tip **61** at one end, and with a head or eye **62** at the other end. The eye **62** receives or passes a thread T as the device is operated in the manner illustrated in Fig. 8 of the drawings.

In accordance with the present invention, the device that I have provided preferably involves an assembly of parts including, a base X, a spool handling means Y carried on the base and rotatably receiving a spool S of thread, or the like, needle handling means Z for receiving and storing a number of needles N, and the needle threading device hereinafter described. The means Y involves a simple pin projecting upwardly from the base X, and the means Z involves a felt pad, or the like, secured to the top of the base.

The needle threading device that I have provided involves, generally, a body A carried by the base X, needle receiving means B in the body A, thread receiving means C in the body A adjacent the means B, threading means D for applying the thread to the head of the needle, thread holding means E for gripping the thread and drawing it through the head of the needle, and thread cutting means F for severing the thread.

The body A may be of any suitable size and shape, and is preferably a flat, vertically disposed element as clearly illustrated in the drawings. The body A has a top **10**, a rear wall or end **11**, a front wall or end **12**, and side walls **13** and **14**. Finger gripping recesses **15** and **16** are provided in the top **10** and front end **12** for engagement by the hand or fingers of the user. As shown in Fig. 1 of the drawings, the body A is divided bi-laterally into two halves or shells which may be secured together at **17**, midway between the sides **13** and **14**, to facilitate manufacture of the body A. It will be understood how the shells of the body may be molded to provide the necessary cavities or recesses necessary to accommodate the mechanism hereinafter described. The body A is secured to the base X by means of suitable screw fasteners **18** engaged with a boss **19** on the base X.

The needle receiving means B is characterized by a guideway **20** that enters the top **10** of the body A to receive and handle the needle N. The guideway **20** is preferably vertically disposed and enters the top **10** near the front end **12** of the body and terminates at a point spaced downwardly from the top **10**. The guideway **20** is adapted to receive the head or eye **62** of needle N, so that the needle is engaged with the guideway throughout a substantial portion of its shank **60**, and so that the tip **61** projects upwardly from the top of the body as shown in Fig. 1 of the drawings.

As shown in Figs. 6 to 9 of the drawings, the guideway **20** may be diamond shaped or substantially square in plan cross section, and is shown formed diagonally within the body A between the sides **13** and **14**. It is a feature of the present invention to so relate the guideway **20** that convergent walls **20a** and **20b** are formed. That is, the walls **20a** and **20b** of guideway **20** are at an angle relative to the side walls **13** and **14** and converge together toward the front end **12** of the body A. The walls **20a** and **20b** are vertically disposed and are parallel with each other, with the exception of the top portions thereof, which are divergent to form an enlarged opening for aiding the entrance of the needle N. As shown in Fig. 9 of the drawings, the guideway **20** terminates in a bottom **21** and has an upper portion **23** that readily and freely passes the head **62** of the needle, and a reduced lower portion **22** for more accurately receiving and centering the head **62** of the needle. The bottom **21** is formed by the end face of an adjusting screw **25** which

may be adjusted to vary the position of the needle head 62 relative to the threading means hereinafter described.

The thread receiving means C is characterized by a slot in the top 10 of the body that extends transversely between the sides 13 and 14. The slot is located adjacent to and toward the rear of the guideway 20, and is preferably V-shaped. The slot has upwardly and outwardly divergent walls 26 and 27, which converge downwardly to a thread positioning vertex portion 28. The wall 26 extends downwardly and forwardly from the top 10, while the wall 27 extends substantially vertically or slightly downwardly and forwardly from the top 10, so that the portion 28 is close to the portion 22 of the guideway 20. The vertex portion 28 is spaced from the top 10 and, as shown in the drawings, is on a level with the bottom portion 22 of the guideway 20.

As shown in the drawings (see Fig. 5) the guideway 20 and the slot are in communication with each other through a thread passage 24. The passage 24 is formed by providing a pair of spaced walls 24^a and 24^b which are vertically disposed, parallel with each other, and which extend longitudinally between the means C and B. The passage 24 is open to the thread receiving slot C, is open to the guideway 20, and opens at the top 10 of body A to allow the thread T to be withdrawn from the device after it has been threaded into the needle as hereinafter described.

The threading means D is provided to transport the thread and acts to pick up the thread T from the means C and pass it through the head or eye of the needle N carried in the means B, and includes, generally, a plunger 30 and actuating means 35 for operating the plunger. The plunger 30 is a slender elongate horizontally disposed part, rectangular in cross sectional configuration and is operable to reciprocate longitudinally between the ends of the body A. A thread engaging end portion 31 is provided on the forward end of the plunger 30 which has a concave face 32 for engaging the thread T. The plunger 30 is slidably carried in a passageway 33 which extends horizontally in the body A and intersects the vertex portion 28 of means C and projects through the lower portion 22 of means B. The passageway 33 extends between the slot and guideway 20, is in communication with the passage 24, and intersects guideway 20 where the upper portion 23 and lower portion 22 are joined.

The actuating means 35 acts to yieldingly reciprocate the plunger 30 toward the forward end 12 of the body A, and is operated by finger pressure. The actuating means 35 includes an actuator 36, a spring 37 yieldingly retracting the actuator 36 and a coupling 38, between the actuator 36 and the plunger 30, yieldingly operating the plunger. The actuator 36 is preferably rectangular in cross section and is an elongate part horizontally disposed and in line with the plunger 30. The actuator 36 is slidably carried in a passageway 39 which extends horizontally through the body A and opens at the rear end 11 thereof, where the actuator is engageable to be depressed by the user.

The spring 37 is carried in a cavity formed in the body A and has an arm 43 anchored in the body, and an arm 40 provided with a head 41 for engaging and operating the actuator 36. The head 41 is round in form and is engaged between opposed walls 42 in the actuator.

The coupling 38 acts as a cushion between the actuator 36 and the plunger 30 and includes a head 45 slidably carried in the actuator 36, and a spring 46 yieldingly urging the head toward the forward end 12 of the body A. The head 45 is secured to and carries the rear end of plunger 30, and is carried in an elongate recess 47 in the actuator 36. A stop or shoulder 48 is provided in the actuator 36 to limit the forward movement of the plunger relative to the actuator, and the spring 46 is engaged in the recess 47 to act between the forwardly facing wall 42 and the head 45 to urge the plunger forward.

When the actuator 36 is operated by the user of the device, it moves forward against the pressure of spring 37 and the plunger 30 is reciprocated forward through the passageway 33. It is to be noted, however, that if any undue resistance exists, the spring 46 will compress allowing the plunger 30 to be stopped so that damage to the plunger, thread or needle will be prevented.

The thread holding means E includes a simple gripping element 55 carried in the body A forward of the means B. As shown in the drawings, the passageway 33 is extended at 56 so that when the plunger 30 is in the position shown in Fig. 8, the thread T is in a position to be engaged by the element 55. The gripping element 55, as shown in the drawings, is a simple folded section of rubber or like resilient material having opposed gripping faces 57 and 58. When the thread is pushed into position, as shown in Fig. 8, and the plunger is withdrawn, the faces 57 and 58 hold the thread in the means E until forcibly retracted therefrom through the passage 24.

The thread cutting means F that I have provided includes a simple knife element 50 carried in the slot of means C. As shown in the drawings, the knife 50 projects forwardly from the wall 26 of the slot between the top 10 and the vertex portion 28 of the slot. The back of the knife faces up and forward, while the cutting edge is faced down. The knife 50 is anchored in the body A between the shells thereof.

In order to thread a needle N, it is merely necessary to drop a needle, head down, into the guideway 20 of the needle receiving means B, draw a suitable length of thread T through the slot of the thread receiving means C so that it lies in the vertex portion 28, operate the actuator 36 of the threading means D so that the plunger picks up the thread at means C and transports it through the eye of the needle carried in the means B, release the actuator, and simply pull the needle out of the means B and away from the device. It will be observed from Fig. 6 of the drawings, that the eye of the needle will not always be perfectly aligned when the needle is inserted by the user. However, from Fig. 7 of the drawings, it will be apparent how the needle eye is perfectly aligned through action of the plunger 30 and the convergent walls 20^a and 20^b. If for any reason the needle eye does not become aligned, then the spring 46 is compressed, as hereinabove described, to protect the device and the thread and needle handled thereby. When the needle is not aligned upon the first operation of the plunger, it is merely necessary to reactuate the plunger one or more times until the needle is in alignment. After alignment of the needle eye the thread is passed through the eye thereof, as shown in Fig. 8 of the drawings, whereupon the actuator is released by the user so that the plunger 30 is retracted from the thread holding means E leaving the thread held thereby. The needle and thread are then free to be removed from the device and the thread to be cut off at the desired length by the means F.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. A needle threading device including, a body having front and rear ends and a top, an elongate vertically disposed needle receiving guideway entering the top at the front end of the body, a vertically disposed thread receiving slot in the top of the body adjacent and to the rear of the guideway, and threading means including a straight horizontally disposed passageway in the body communicating with the lower end of the slot and guideway and terminating forward of the guideway, a horizontally disposed plunger positioned in and adapted to reciprocate in the passageway and intersect the guideway and the slot to engage a thread engaged in the base of the slot and push it through the eye of a needle engaged in

the guideway and in alignment with the passageway, and actuating means at the rear end of the body for the plunger, said actuating means having an actuator accessible at the exterior of the body and positioned in and adapted to reciprocate longitudinally in the body and a resilient coupling between the actuator and plunger yieldingly operating the plunger.

2. A needle threading device including, a body having front and rear ends and a top, an elongate vertically disposed needle receiving guideway having parallel vertically disposed forwardly convergent walls and entering the top of the body at the front end thereof, a thread receiving slot in the top of the body adjacent and to the rear of the guideway, threading means including a straight horizontally disposed passageway in the body communicating with the lower end of the slot and guideway and terminating forward of the guideway, a horizontally disposed plunger positioned in and adapted to reciprocate in the passageway to intersect the guideway and the slot, and actuating means for the plunger at the rear end of the body, said actuating means including an actuator accessible at the exterior of the body and positioned in and adapted to reciprocate longitudinally in the body and drive the plunger, said plunger being operable to pick up thread at the base of the slot and pass it to the forward end of the passageway through the eye of a needle in the guideway and aligned with the passageway, and thread holding means at the forward end of the passageway adjacent to and forward of the guideway for retaining the thread when the plunger is retracted and including a folded body of rubber having opposed thread gripping faces held in pressure engagement with each other by the sides of the body.

3. A needle threading device including, a body having front and rear ends and a top, an elongate vertically disposed needle receiving guideway entering the top of the body at the front end thereof, a vertically disposed thread receiving slot in the top of the body adjacent and to the rear of the guideway, threading means including a straight horizontally disposed passageway extending longitudinally in the body and communicating with the lower ends of the slot and guideway and terminating forward of the guideway, a horizontally disposed plunger positioned in and adapted to reciprocate in the passageway to intersect the guideway and slot to engage a thread engaged in the base of the slot and push it through the eye of a needle engaged in the guideway and in alignment with the passageway, and actuating means for the plunger at the rear end of the body, said actuating means having an elongate horizontally disposed actuator positioned in and adapted to reciprocate longitudinally in the body, a resilient coupling between the actuator and plunger yieldingly operating the plunger, and thread holding means at the end of the passageway adjacent to and forward of the guideway for retaining the thread when the plunger is retracted, the said resilient coupling including a helical compression spring carried by the actuator and engaging the plunger.

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