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SEWING MACHINE NEEDLE THREADER

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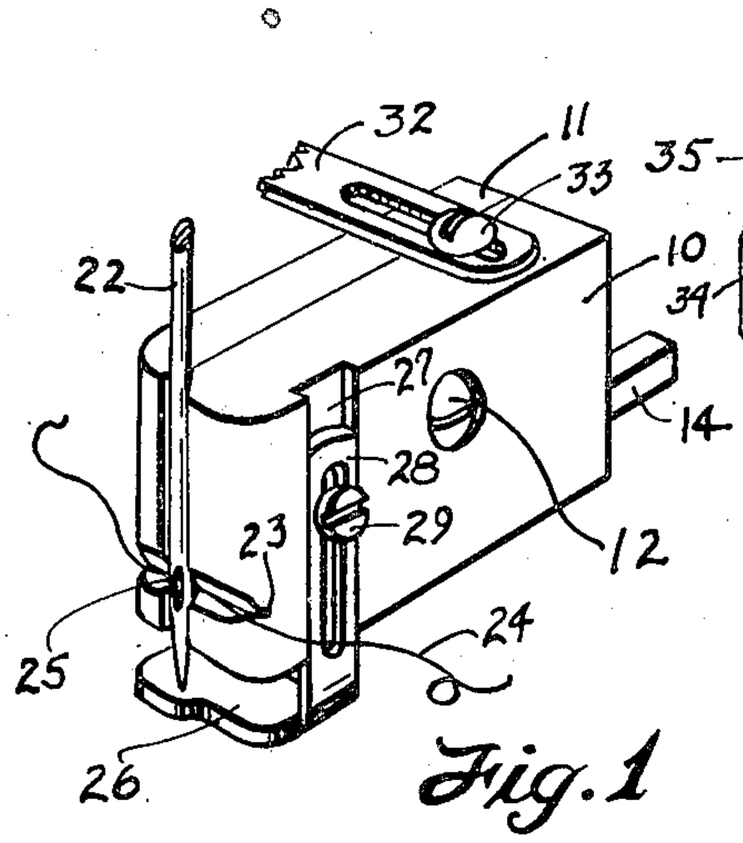

Fig. 1

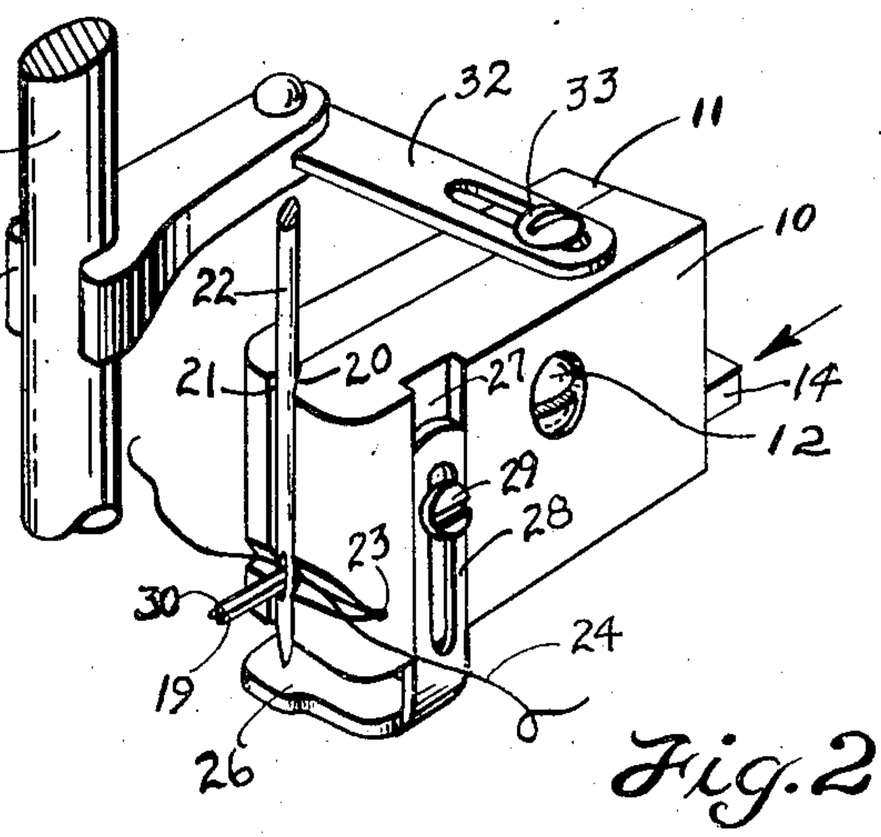

Fig. 2

Fig. 5

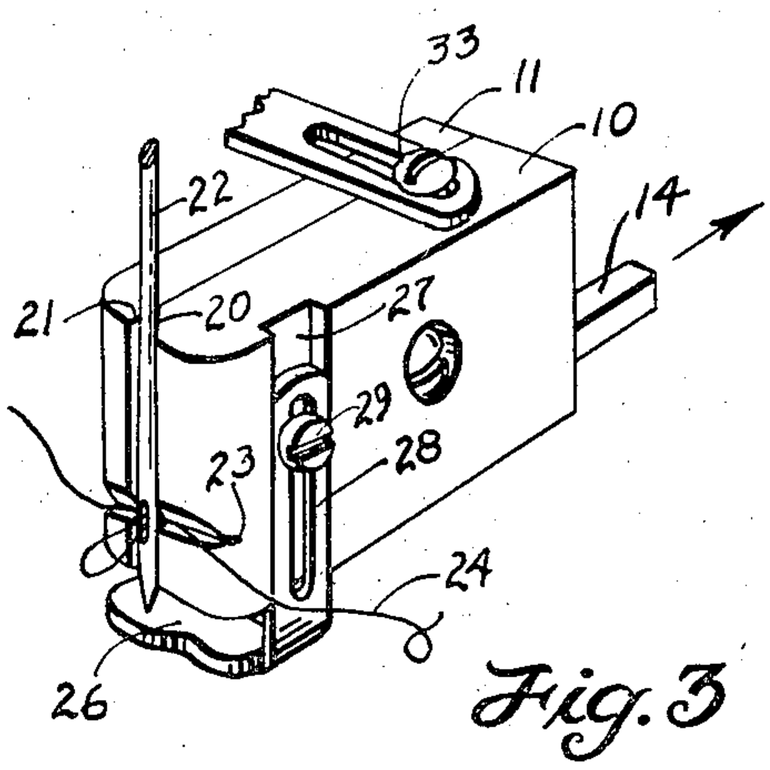

Fig. 3

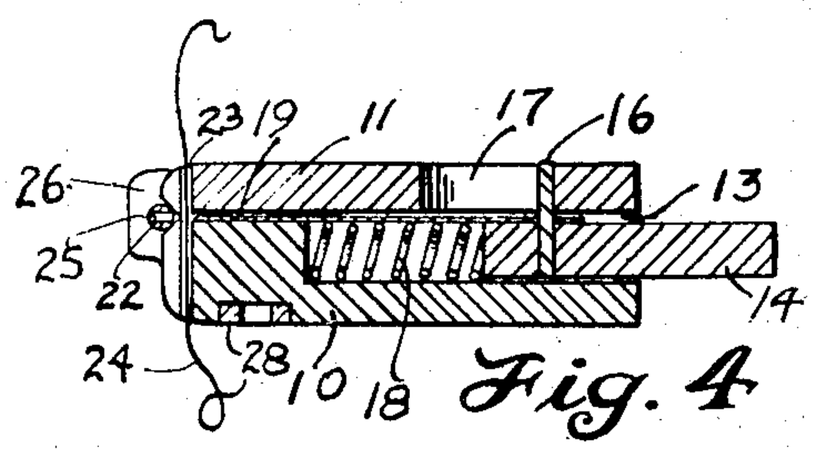

Fig. 4

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SEWING MACHINE NEEDLE THREADER

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5 Claims. (Cl. 112—225)

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This invention relates to improvements in needle threading devices and is particularly adapted for use in connection with threading of sewing machine needles of various measurements as well as threads of different sizes such as encountered in the household type of sewing machine.

It is the principal object of this invention to provide a needle threading device including a threading pin operable to push a strand of thread in the form of a loop through the eye of a needle wherein the threading pin is of such construction and design as to insure greater accuracy in the threading operation, reduce the strain on the pin while in actual service and thereby increase its life, and sufficiently light in weight to facilitate its movement between operative and inoperative positions relative to its mounting.

Another object of this invention is to provide a needle threading device embodying such features of construction and design as to render the same easier to adjust in initially bringing the threading pin into registry with the eye of the needle to be threaded.

Another object is to provide a device of this character which incorporates features of construction and design susceptible of economical manufacture and assembly.

With the above and other objects in view, as will be apparent, this invention consists in the construction, combination and arrangement of parts, all as hereinafter more fully described, claimed and illustrated in the accompanying drawing:

Fig. 1 is a perspective view of the present needle threading device illustrating the threading pin in retracted position.

Fig. 2 is a similar view illustrating the threading pin in advanced position.

Fig. 3 is a similar view illustrating the threading pin in retracted position after completion of movement to an advanced position with the strand of thread arranged in a loop through the eye of the needle.

Fig. 4 is a longitudinal central sectional view through the device as shown in Fig. 1.

Fig. 5 is a slightly reduced perspective view of the present needle threading device illustrating its application to a bracket fixed to the head of the sewing machine.

In carrying out the present invention, a substantially rectangular unit is provided by means of a pair of plates 10 and 11 of metal or other suitable composition, secured mutually in face-to-face upright relation with their edges in registry by means of conventional means, such as a screw 12. The plate 10, which may be of slightly greater thickness than the plate 11, if desired, is machined or otherwise operated upon to provide a longitudinal recess on its inwardly directed surface to provide conjointly with the inner surface of the plate 11, a bore or passageway 13 extending the full length of the joined plates 10 and 11. One end of the passageway 13 is of enlarged transverse cross-sectional dimension to provide a chamber or bearing in which an operating rod 14 may have longitudinal sliding movement toward and away from an operative position in the passageway, with its trailing end protruding from the limits of said passageway in either operative or inoperative position therein. A lateral projection or stud 16 secured to the portion of the rod 14 confined within the passageway 13 projects outwardly through a slot 17 in the side of the plate 11. Thus the longitudinal limits or edges of the slot 17 act to limit the extent of sliding movement of the rod 14 in the passageway 13. A spring 18 arranged in leading relation to the rod 14 presses against the rod 14 and the forwardmost limits of the enlarged portion of the passageway 13 to normally urge the rod 14 and the stud 16 to a position wherein the rod 14 is in retracted or inoperative position, as shown in Fig. 4.

The portion of the passageway 13 extending forwardly from the enlarged portion aforesaid provides a bearing for a relatively thin threading pin 19 which is adapted to project from the forward end of the passageway 13 when the operating rod 14, to which the trailing end of said pin 19 is suitably secured, is in forwardmost or operative position. The threading pin 19 is preferably of spring metal so as to be resilient enough to avoid breakage under strains applied to its leading edge by the strand of thread in engagement therewith as it enters and passes through the eye of the needle.

The upright meeting edges of the plates 10 and 11 intersected by the forward limits of the passageway 13 are preferably bevelled to provide inwardly converging surfaces 20 and 21 defining conjointly a recess or seat adapted to seat or circumferentially embrace needles of various diameter, such as the needle 22 shown in the drawing. A groove 23 defined by the inwardly converging surfaces of a recess arranged to cross the surfaces 20 and 21 in registry with the forward limits of the passageway 13 is extended slightly inward of the inner limits of the surfaces 20 and 21 to afford a pocket in which a strand of thread 24

may be confined to obstruct the path of the threading pin 19 without being susceptible to withdrawal or dislodgment by the force of gravity pending engagement and advancement of the thread through the eye of the needle by the threading pin.

In order that the device may be accurately aligned to insure registration of the passageway 13 relative to the eye 25 of the needle 22 to be threaded, a plate 26 is preferably mounted for adjustment in a path parallel to the axis of the needle in a position to engage the point of the needle. A keyway 27 in the side of the plate 10 provides a suitable seat for a bracket 28 from which the plate 26 is suspended in underlying relation to the needle seat formed by the surfaces 20 and 21. A screw 29 secured to the bottom of keyway 27 is adapted to be adjusted to rigidly secure the bracket 28 in selected position lengthwise of the keyway 27 whereby the height of the plate 26 may be properly maintained in accordance with the aligned positions of the needle eye and the passageway 13.

The threading pin 19 is preferably dished or concaved at its forward edge 30 to facilitate engagement of the strand of thread centrally of its leading end.

In order to conveniently maintain the device in a position to facilitate its application to the needle by movement in a horizontal path, any suitable means may be employed. For example, as shown in Fig. 2, a bar 32 adjustably fastened as at 33 and having a bifurcated head 34 adapted to embrace a presser foot bar 35 of the machine, affords an efficient arrangement for this purpose.

In operating the present threading device, it is advisable to initially operate the machine to position the needle in its upwardmost position. Having then arranged a strand of thread in the groove 23 so as to retain the thread in a position to resist withdrawal or dislodgment by force of gravity, the bifurcated head 34 is manually applied and supported in embracing relation to the presser foot bar 35 at a position lengthwise thereof to assure that the plate 26 is disposed below the point of the needle 22. Thus the needle and the presser foot bar provide laterally spaced supports for maintaining the device in selected horizontally rotated position relative to the eye of the needle 22. Having swung the bar 32 to position the inwardly converging surfaces 20 and 21 in a position to straddle the needle, and having determined the position of the plate 26 in vertical relation to the eye of the needle to assure aligned relation of the eye of the needle and the passageway 13 when the point of the needle rests on the plate 26, the device is elevated until the point of the needle touches the upper surface of the plate 26. By holding the device firmly in this position with one hand, and simultaneously pressing inwardly on the operating rod 14 until it reaches the limit of its forward or inward movement, the threading pin and the loop of thread engaged thereby, are moved accurately through the eye of the needle. Upon releasing the rod 14, the spring 18 is relaxed forcing the rod 14 to inoperative position and simultaneously withdraws the threading pin from the eye of the needle, leaving the thread loop projecting through the eye of the needle.

It might also be desirable to permanently mount the device on the head of a sewing machine by means of a bracket 36 providing an upright bearing 37 on which an arm 38 is rotatable to swing its end fastened as at 40 to the plate 10, in the same manner of swinging movement as

described in connection with the bar 32 and head 34 cooperating with the presser foot bar.

The threading pin 19, when constructed of spring metal having a cross-sectional dimension of .030 inch by .003 inch operating in a passageway having a cross-sectional dimension of .035 inch by .006 inch, with the greatest of said dimensions arranged lengthwise of the axis of the needle 22, and arranged to travel approximately $\frac{3}{32}$ inch between advanced and retracted positions, has been demonstrated to operate with unerring results on needle eyes of various measurement in machines of conventional household type design, and on threads of different sizes applicable thereto.

What is claimed is:

1. A needle threading device comprising a pair of plates secured mutually in face-to-face relation with their edges in registry to provide a rectangular housing, a passageway arranged longitudinally of the inner face of one of said plates, a threading pin movable lengthwise of said passageway toward and away from a position wherein an end portion thereof projects outwardly from said passageway, inwardly converging surfaces formed in a pair of meeting edges of said plates to provide a seat with which the sides of a needle to be threaded are engageable, means mounted for adjustment lengthwise of said inwardly converging surfaces presenting an abutment with which the point of the needle is engageable to maintain said passageway in a position in alignment with the eye of said needle when the sides of the needle are seated against said inwardly converging surfaces, means acting on said threading pin to bias the same into a position wherein said end portion is inwardly retracted relative to said passageway means operable to move said threading pin from a position wherein said end portion is inwardly retracted relative to said passageway to a position wherein its end projects through said eye of the needle, and a pocket intersecting the junction of said converging surfaces and extending inwardly therefrom to support a strand of thread between the needle and the housing in a position obstructing the path of movement of said threading pin during movement of the pin toward a position wherein its end projects through said eye of the needle.

2. A needle threading device comprising a housing, a passageway arranged longitudinally thereof, a threading pin movable lengthwise of said passageway toward and away from a position forwardly of the longitudinal limits of said passageway, inwardly converging surfaces formed in said housing in which a needle may be seated with its longitudinal axis extending lengthwise of said inwardly converging surfaces with the eye of the needle in alignment with the longitudinal limits of said passageway, means operable to move said threading pin from a retracted position within said passageway to a position projecting through said needle eye when the needle is seated against said inwardly converging surfaces of the housing and biased to a position corresponding to retracted position of said threading pin, and a pocket intersecting the junction of said inwardly converging surfaces and extending inwardly therefrom to support a strand of thread between the needle and the housing in a position obstructing the path of movement of said threading pin during movement of the pin toward a position projecting through said needle eye.

3. A needle threading device comprising a threading pin of spring metal adapted to enter and pass through the eye of a needle with a strand of thread of conventional thickness arranged in a loop around the leading edge thereof, a housing provided with a passageway in which said threading pin has longitudinal sliding support from a retracted position to an advanced position projecting from said housing, and return, means for moving said threading pin from a retracted position to an advanced position having sliding support in said housing, and means mounted on said housing for adjustment lengthwise of the axis of a needle to be threaded and presenting an abutment with which the point of the needle is engageable to maintain said passageway in alignment with the eye of the needle.

4. A needle threading device as described in claim 3 wherein said means for moving said threading pin from a retracted position to an advanced position has sliding support in said housing and is biased to a position corresponding to the retracted position of said threading pin.

5. A needle threading device as described in claim 2 including means mounted on said housing for adjustment lengthwise of said inwardly converging surfaces of the housing and presenting an abutment with which the point of the needle is engageable to maintain said passageway in alignment with the eye of the needle.

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