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M. EPSTEIN

2,952,851

SELF-LOADING FASTENER MEANS

Filed June 3, 1959

FIG. 1

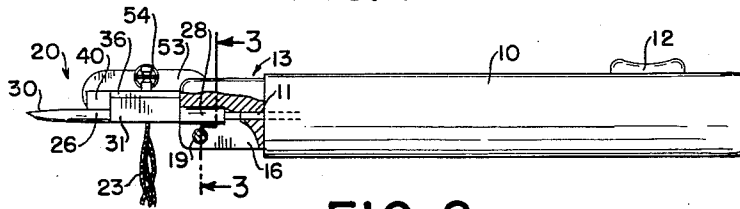


FIG. 2

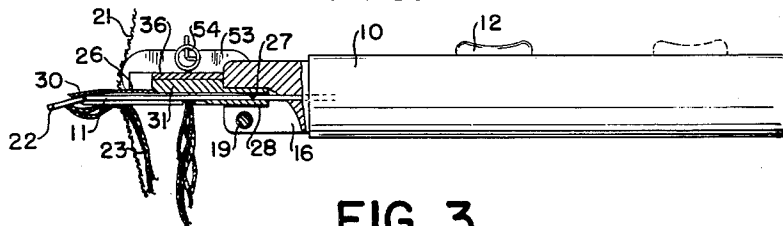


FIG. 3

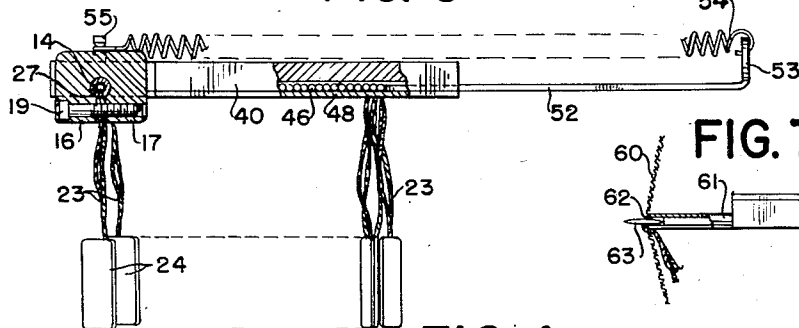


FIG. 7

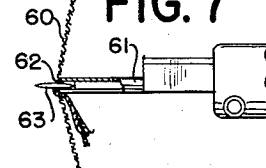


FIG. 4

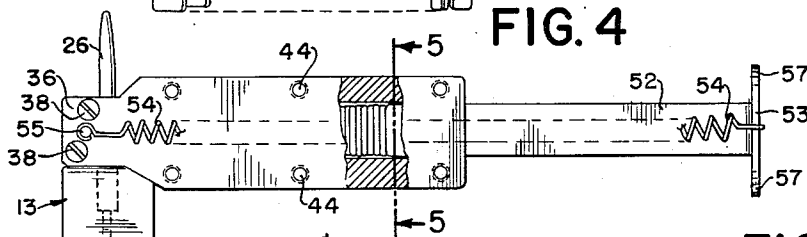


FIG. 6

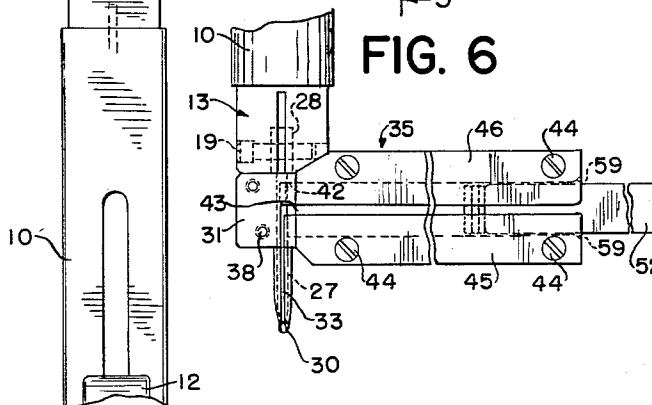
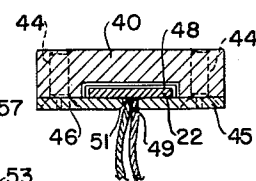


FIG. 5



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SELF-LOADING FASTENER MEANS

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4 Claims. (Cl. 1-46)

This invention relates to manually operated devices for threading through penetrable materials, such as fabrics and the like, thin fastener bars which are attached to extended flexible strands. More particularly, it relates to a device of the type described provided with a detachable self-loading needle assembly which permits a multiplicity of such bars and strands to be successively loaded in threading position automatically upon each operation of the device.

Tags recording price and other data are usually attached to articles of clothing, fabrics, and the like by means of a short loop of string, the ends of which are joined together at the center of a thin transverse fastening bar. When this bar is passed through the material it cannot return therethrough, thereby holding the tag in place. To thread such fastening bars through fabrics, a convenient device is in common use which includes a plunger having a lateral cross section substantially equal to that of the bar and a slotted tubular needle through which the plunger may be manually reciprocated. The fastening bar is first inserted in the needle with the string hanging through the slot and the needle is passed through the fabric. Then the plunger is pushed through the needle and the bar exits therefrom on the backside of the fabric. When the needle is withdrawn, the tag is left securely attached on the frontside since the transverse bar cannot return through the fabric.

A major disadvantage of this otherwise satisfactory tag-threading device is that, after each operation, the next bar and attached string must be carefully inserted into the needle before the operation can be repeated. In fact, the inserting procedure between operations of the device usually takes far more time than the operations themselves. Also, the operator must have with him a supply of string-attached bars and tags from which he can select the ones to be inserted in the device, and oftentimes such a supply can become badly snarled.

It is the broad purpose of this invention, therefore, to provide an assembly for use with such fastening devices which permits a considerable number of these bars and attached strings to be automatically loaded successively into operative threading position after each operation. Thus, the operator need not pause in his work to insert the bars and strings individually but can go from one piece of material to the next without stopping. Moreover, his supply of string-attached bars and tags are kept in orderly arrangement on the device itself and consequently does not tend to become snarled and tangled.

Accordingly, the invention provides a detachable self-loading needle assembly in combination with a device for threading through penetrable materials a thin bar transversely attached to an extended strand. Such a device includes a plunger which has a lateral cross section substantially equal to that of the bar and which is selectively longitudinally reciprocable in a frame from a retracted position therewithin to an extended position projecting therefrom.

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Broadly stated, the new assembly comprises a hollow tubular member substantially defining a rectilinear bore extending completely therethrough. The tubular member is adapted to be fitted to the frame with the bore aligned with the plunger. Also, the plunger is adapted to fit closely within and project substantially to the outer end of the bore when moved to its extended position. Formed in the tubular member is a first slot which extends from the outer end thereof a considerable distance along its length in communication with the bore therewithin. This first slot is narrower than the thickness of the bar and wider than the thickness of the strand. A magazine extends sidewardly from the tubular member and substantially defines a thin elongated chamber opening into the bore. Formed in the magazine is a second slot which intersects the first slot and extends a considerable distance along the length of the magazine in communication with the elongated chamber therewithin. This elongated chamber is adapted to receive a multiplicity of the bars in side-by-side relationship with the respective strands attached to the bars extending through the second slot. A spring-mounted slide is movable within the elongated chamber for urging the bars therewithin toward and into said bore.

By this construction, as the plunger is reciprocated the bars are urged laterally through the chamber by the slide with their attached strands advancing through the second slot. Then they are successively forced longitudinally through and out of the bore with their attached strands advancing through the first slot. In one embodiment of the invention, the tubular member is bevelled at its outer end to provide a pointed terminus for piercing the penetrable material. However, if this would tend to tear the material, a second embodiment is provided wherein the tubular member is faced off at its outer end to provide a flat terminus and the bar itself is pointed to pierce the material.

Preferred embodiments of the invention are described hereinbelow with reference to the accompanying drawing, wherein

Fig. 1 is an elevation partly broken away of a fastening device of the type described equipped with the self-loading needle assembly of the invention;

Fig. 2 is an elevation partly broken away of the device of Fig. 1 with the needle threaded through a piece of fabric and about to discharge a fastening bar;

Fig. 3 is a section partly broken away taken along the line 3-3 of Fig. 1;

Fig. 4 is a plan view partly broken away of the upper side of the device of Fig. 1;

Fig. 5 is an enlarged section taken along the line 5-5 of Fig. 4;

Fig. 6 is an enlarged fragmentary plan view partly broken away of the underside of the magazine and the adjoining portion of the tubular member; and

Fig. 7 is a fragmentary elevation partly in section of another embodiment of the tubular member of the new assembly adapted to thread pointed string-attached bars through penetrable material.

Referring first to Figs. 1 through 4, the device includes a conventional body portion or frame 10 adapted to be gripped in the hand of the user. Slidably mounted in the body portion 10 is a plunger 11 which is selectively longitudinally reciprocable from a retracted position therewithin, as seen in Fig. 1, to an extended position projecting therefrom, as seen in Fig. 2. The plunger 11 is selectively operated by manipulation of a thumb actuator 12 adapted to move the plunger on its slidable mounting.

In reciprocating in and out of the body member 10, the plunger 11 passes through a clamp 13 extending from one end of the body member. As shown in Figs. 1 and 3, the clamp 13 defines an inner cylindrical slit seat 14

concentrically surrounding the plunger 11 in its extended position. A pair of opposed clamping portions 16 and 17 depending from each side of the seat 14 are threaded through by a screw 19 which, when tightened, draws the portions 16 and 17 together and closes the seat 14.

It is the purpose of the clamp 13 to hold a needle assembly 20 through which the plunger 11 may be reciprocated to thread through penetrable fabric 21 (see Fig. 2) a thin bar 22 transversely attached to an extended double string 23. Attached to the lower loop of the string 23 is a small piece of cardboard 24. A tag bearing data relating to the fabric is secured to the string 23 by passing the bar 22 and string 23 through a hole in the tag which is not large enough to pass the piece of cardboard 24.

The new needle assembly 20 is a self-loading unit which includes a hollow tubular member 26 having a rectilinear bore 27 extending completely therethrough. The bore 27 is large enough to permit one of the bars 22 to pass longitudinally through it. At one end of the tubular member 26 is a cylindrical butt portion 28 adapted to fit into and be held by the seat 14 with the bore 27 aligned with the plunger 11. The length of the tubular member 26 and the diameter of its bore 27 are such that, when the butt portion 28 is held in the seat 14, the plunger 11 is adapted to fit closely within and project substantially to the outer end of the bore 27 when moved to its extended position shown in Fig. 2. In the embodiment shown in Fig. 1, the outer end of the tubular member 26 is bevelled to provide a pointed terminus 30 for piercing the fabric 21.

Also included in the tubular member 26 is an integral flat enlarged portion 31 adjoining the butt portion 28. A first slot 33 is formed in the underside of the tubular member 26 extending longitudinally along the length of the tubular member, in communication with the bore 27 therewithin, from the pointed terminus 30 thereof to the central portion of the underside of the enlarged portion 31 (see Fig. 6). This first slot 33 is narrower than the width of the bars 22 but wider than the string 23 attached thereto.

Extending sidewardly from the enlarged portion 31 of the tubular member 26 is a magazine 35. In Figs. 3 and 4, a flat extension 36 is shown on the magazine 35 which overlies the upperside of the enlarged portion 31 and is attached thereto by a pair of screws 38. As shown in Figs. 4 through 6, the magazine 35 includes a channel-like body section 40 having its open side directed downwardly and extending sidewardly from and in the plane of the bore 33 in the tubular member 26. The depth and width of the channel in the body section 40 is somewhat greater than the width and length respectively of the bars 22. Formed in the side of the enlarged portion 31 of the tubular member 20 is a rectangular passage 42 which communicates with the bore 27 therewithin and with the channel in the body section 40 of the magazine 35, and which is substantially equal in cross section to the channel. A short slot 43 in the underside of the enlarged portion 31 extends perpendicularly from the end of the first slot 33 to the magazine 35 in communication with the passage 42.

Secured by screws 44 to the underside of the channel-like body section 40 are a pair of opposed plates 45 and 46 extending inwardly over the channel formed therein from the tubular member 26 to the outer end of the magazine 35. The adjacent parallel edges of these plates 45 and 46 are spaced apart centrally under the body section 40 so that, with the body section 40, they form a thin elongated chamber 48 exposed by a second slot 49. This slot 49 is equal in width to and aligned with the short slot 43 intersecting the first slot 33. As shown in Fig. 5, these opposed edges of the plates 45 and 46 are round off with radii 51. By this construction, the elongated chamber 48 is adapted to receive a multiplicity of the bars 22 in side-by-side relationship with the re-

spective strings 23 attached to the bars extending through the second slot 49.

Longitudinally movable in the chamber 48 is an extended slide 52 having a transverse cross section just slightly smaller than that of the chamber 48. The outer end of the slide 52 extends beyond the end of the body section 40 even when its opposite end projects substantially into the tubular member 26. On the outer end of the slide 52 is an upper rigid holed bracket portion 53 in which one end of a tension spring 54 is attached. The opposite end of the spring 54 is secured by a fastener 55 on the upper side of the enlarged portion 31 of the tubular member 26. Thus, the spring 54 continuously urges the slide 52 into the chamber 48 toward the tubular member 26. Tabs 57, on each side of the bracket portion 53, provided means for pulling the slide 52 out of the chamber 48 against the force of the spring 54. To aid in reinserting the slide 52 into the chamber 48, the corners 59 (see Fig. 6) at the end of the chamber are flared out.

In the operation of this fastening device, the needle assembly 13 is mounted on the frame 10 by gripping the butt portion 28 in the split seat 14 and tightening the screw 19. The slide 52 is then withdrawn from the magazine chamber 48 by pulling outwardly on the tabs 57 against the force of the spring 54. A multiplicity of string-attached bars 22 are then slipped side-by-side into the chamber 48, with their strings 23 depending through the slot 49, until the chamber 48 is approximately three-fourths full. The slide 52 is next reinserted in the chamber 48 and forces the bars therein toward the bore 27 in the tubular member 26. The first bar therefore passes through the passage 42, and its string through the short slot 43, and enters the bore 27.

The pointed terminus 30 of the tubular member 26 is then pierced through the fabric 21 and the actuator 12 is moved forwardly. This causes the plunger 11 to move through the bore 27 and force the bar 22 therein toward the open pointed end of the tubular member 26. The string 23 advances through the first slot 33 as the bar 22 moves forward until the bar exits from the bore 27 on the other side of the fabric 21, as shown in Fig. 1. Then the tubular member 26 is withdrawn leaving the string 23 threaded through the fabric 23 with the bar 22 holding it in place.

As the plunger 11 is returned to its retracted position shown in Fig. 1 (and this may be done manually or automatically by spring-loading the plunger), the intersection of the bore 27 and chamber 48 is cleared by the end of the plunger 11. When this happens, the bars 22 in the chamber 48 are pushed forwardly by the slide 52 so that the next bar automatically loads into the bore 27. The strings 23 therefore advance in the second slot 43 and are prevented from being cut or frayed by the radii 51. Then, the tubular member 26 is inserted through another piece of fabric and the newly-loaded bar is threaded as before. This operation may be repeated a multiplicity of times until the chamber 48 is emptied of string-attached bars.

Turning now to Fig. 7, a modification of this new assembly is shown for threading fastener bars through a particularly fine fabric 60. All the elements of the assembly are the same except that the outer end of its tubular member 61 is faced-off to provide a blunt terminus 62. A pointed fastening bar 63 is used, however, so that the fabric is pierced by the bar 63 alone during operation and not by the tubular member 61 also. The blunt terminus 62 of the tubular member remains on the near side of the fabric 60, as shown, and only the bar 63 does the piercing.

I claim:

1. In a device for threading through penetrable materials a thin bar transversely attached to an extended strand, said device including a plunger which has a lateral cross section substantially equal to that of said bar and

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is selectively longitudinally reciprocable in a frame from a retracted position therewithin to an extended position projecting therefrom, a detachable self-loading needle assembly comprising a hollow tubular member substantially defining a rectilinear bore extending completely therethrough, said tubular member being adapted to be fitted to said frame with said bore aligned with said plunger, said plunger being adapted to fit closely within and project substantially to the outer end of said bore when moved to its extended position, said tubular member having a first slot formed therein extending from the outer end thereof a considerable distance along its length in communication with the bore therewithin, said first slot being narrower than the thickness of said bar and wider than the thickness of said strand, a magazine extending sidewardly from said tubular member and substantially defining a thin elongated chamber opening into said bore, said magazine having a second slot formed therein intersecting said first slot and extending a considerable distance along the length of said magazine in communication with the elongated chamber therewithin, said elongated chamber being adapted to receive a multiplicity of said bars in side-by-side relationship with the respective strands attached to said bars extending through said second slot, and a spring-mounted slide movable within said elongated chamber for urging the bars therewithin toward and into said bore, whereby as said plunger is reciprocated said bars are urged laterally through said chamber by said slide with their attached strands advancing through said second slot and are successively forced longitudinally through and out of said bore with their attached strands advancing through said first slot.

2. In a device for threading through penetrable materials a thin bar transversely attached to an extended strand, said device including a plunger which has a lateral cross section substantially equal to that of said bar and is selectively longitudinally reciprocable in a frame from a retracted position therewithin to an extended position projecting therefrom, a detachable self-loading needle assembly comprising a hollow tubular member substan-

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tially defining a rectilinear bore extending completely therethrough, said tubular member having a butt portion adapted to be fitted to said frame with said bore aligned with said plunger, said plunger being adapted to fit closely within and project substantially to the outer end of said bore when moved to its extended position, said tubular member having a first slot formed in its underside extending from the outer end thereof a considerable distance along its length in communication with the bore therewithin, said first slot being narrower than the thickness of said bar and wider than the thickness of said strand, a magazine extending sidewardly from said tubular member and substantially defining a thin elongated chamber perpendicular to and opening into said bore at one end and having a flared outer end, said magazine having a second slot formed in its underside intersecting said first slot and extending a considerable distance along the length of said magazine in communication with the elongated chamber therewithin, the edges of said second slot being rounded, said elongated chamber being adapted to receive a multiplicity of said bars in side-by-side relationship with the respective strands attached to said bars extending through said second slot, and a spring-mounted slide movable with said elongated chamber for urging the bars therewithin toward and into said bore, whereby as said plunger is reciprocated said bars are urged laterally through said chamber by said slide with their attached strands advancing through said second slot and are successively forced longitudinally through and out of said bore with their attached strands advancing through said first slot.

3. In a device according to claim 2 wherein said tubular member is bevelled at its outer end to provide a pointed terminus for piercing said penetrable material.

4. In a device according to claim 2 wherein said tubular member is faced off at its outer end to provide a blunt terminus for the threading of pointed thin bars.

No references cited.