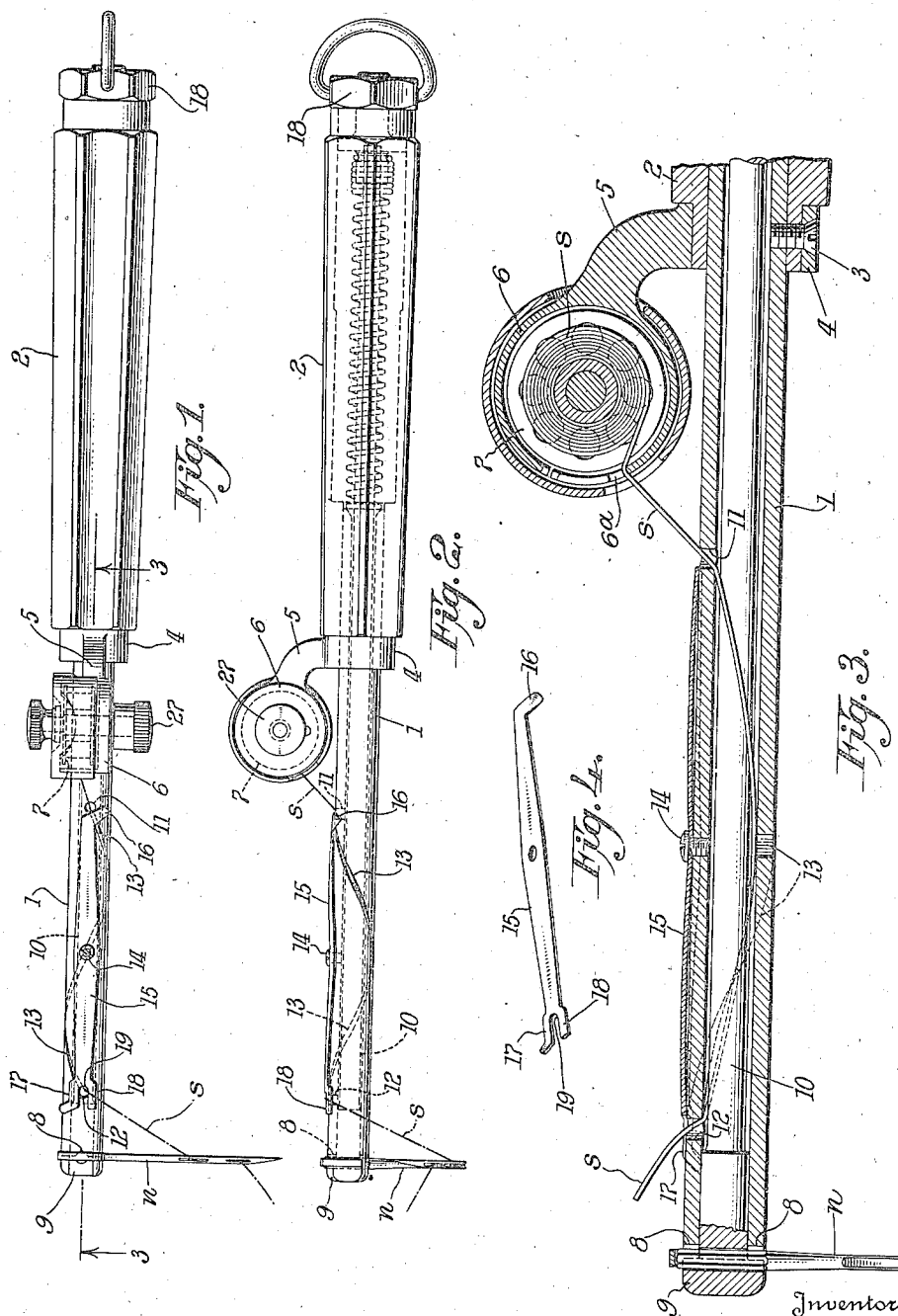


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SUTURE PROTECTING AND TENSIONING MEANS FOR
SURGICAL STITCHING INSTRUMENTS
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SUTURE PROTECTING AND TENSIONING
MEANS FOR SURGICAL STITCHING IN-
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4 Claims. (Cl. 128-340)

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This invention relates to surgical stitching instruments of the type disclosed in my United States Patent No. 2,348,218, May 9, 1944, each of which carries a spool of suturing material and an eye-pointed needle to which the suturing material is directed.

It is common practice for dealers in surgical goods to supply catgut suture sterilized and held within suitable sealed ampoules which are substantially filled with a liquid, such, for example, as alcohol, which maintains the suture in a sterile condition and keeps it soft and pliable.

When such suture is used in the instrument disclosed in my above mentioned patent, it is removed from the ampoule, wound upon a spool and the spool is placed in the spool-holder of the instrument. A portion of the suture is then drawn off the spool and the end thereof is passed through the suture guide at the front end of the instrument and is then threaded through the eye, or eyes, of the needle; after which the instrument and the suture are again sterilized.

When, during the performance of an operation, the instrument is handled, that portion of the thread extending between the spool and the needle is exposed and subjected to the action of air currents and therefore tends to dry and stiffen rather quickly. If, due to delays etc., the drying and stiffening progresses too far, proper handling of the suture becomes difficult.

From the foregoing it will be appreciated that anything that can be done to prevent or retard the drying and stiffening of the suture will be important, as it will facilitate handling of the suture.

This invention therefore has as its primary object to provide improved means for housing the suture in its travel from the spool to the needle, thereby to protect the suture and prevent drying and contamination thereof.

Another object of the invention is to provide means for controlling and slightly tensioning the suture in its travel from the spool to the suture-guide at the forward end of the instrument.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several

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features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawing,

Fig. 1 is a plan view of a surgical stitching instrument embodying the present invention.

Fig. 2 is a side view thereof.

Fig. 3 is an enlarged longitudinal section taken substantially on the line 3-3 of Fig. 1.

Fig. 4 is a perspective view of a suture-retaining element, later to be described, removed from the instrument.

Referring more specifically to the drawing, the invention is disclosed as embodied in a surgical stitching instrument comprising a main supporting element or needle-bar 1, of tubular form, to one end of which is secured a handle 2 by means of which the instrument may be held and manipulated. Upon one end of the handle there is secured, by a screw 3, a collar 4 forming a part of a bracket 5. The bracket 5 carries a spool-case 6 in which is rotatably mounted a spool 7. The spool has wound thereon suitable suture 8 for use with the instrument. The screw 3, which secures the collar 4 to the handle, also secures the handle to the needle-bar 1. Means, not shown, is provided for locking the spool against rotation and this means may be released by thumb pressure on the cap-nut 27. Inasmuch as the means for locking and releasing the spool forms no part of this invention and is fully shown and described in my above mentioned Patent No. 2,348,218, detailed illustration and description thereof herein is deemed unnecessary.

At its free end, the needle-bar 1 carries a fixed needle-clamping jaw 8 with which cooperates a movable clamping jaw 9 to grip the shank of the needle *n*. The jaw 9 is carried by a needle-clamp actuating rod 10, which extends through the instrument and which is shifted axially, to cause the jaws to grip the needle, by a manually rotatable nut 13 at the rear end of the handle, substantially the same as shown in my above mentioned patent.

To house the suture in its travel from the spool to the needle, means is provided whereby the suture may be caused to enter the tubular needle-bar adjacent the spool-holder, to extend lengthwise of the instrument within the needle-bar and to emerge from the needle-bar adjacent the needle. This means comprises a suture inlet

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aperture 11 in the needle-bar 1 adjacent the spool-holder, a suture outlet aperture 12 in the needle-bar adjacent the needle-clamp, and a helical slot 13 extending through the wall of the needle-bar and connecting said apertures.

Secured to the needle-bar, as by screw 14, is a sheet metal suture-retaining element 15 having, at one end, an off-set retaining finger 16 which overlies the slot 13 adjacent the aperture 11. The opposite end of the element 15 is bifurcated and comprises an off-set retaining finger 17 which overlies the slot 13 adjacent the aperture 12, and a finger 18 between which and the finger 17 is provided a suture guiding throat 19. From the throat 19, the suture extends to the eye, or eyes, of the needle. The outer ends of the fingers 16 and 17 are preferably spaced slightly from the surface of the needle-bar, to facilitate drawing of the suture thereunder.

In threading the suture through the instrument the suture, extending from the spool 7 through a slot 6^a in the spool-holder 6, is drawn under the finger 16 and into aperture 11. The suture is then drawn lengthwise of the instrument and given one turn about the longitudinal axis thereof, thus causing the suture to pass through the helical slot 13 and be wrapped once about the needle-clamp actuating rod 10. This movement of the suture also causes it to be drawn under the retaining finger 17 and through the outlet aperture 12, after which the end thereof is threaded through the eye, or eyes, of the needle.

From the foregoing it will be perceived that this invention provides simple and convenient means for housing the major portion of the suture between the spool and the needle within the tubular needle-bar, thereby protecting it against contamination and against the drying action of air currents.

It will also be understood that, inasmuch as the suture is wrapped about the needle-clamp actuating rod, it will be held against lateral movement relative to the instrument and will also have a slight tension applied thereto which will aid in the control of the suture.

Having thus set forth the nature of the invention what I claim herein is:

1. In a surgical stitching instrument having a hollow needle-bar, a needle-clamp at one end thereof, a needle-clamp actuating rod extending through said needle-bar and connected with said needle-clamp, and a spool-holder carried by the instrument adjacent said needle-bar remote from said needle-clamp and carrying a spool of suture; the improvement which consists in the provision in said needle-bar of a helical slot extending through the wall thereof from adjacent said

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spool-holder to adjacent said needle-clamp and providing for the lateral passing of a suture from said spool into and out of said needle-bar at axially spaced points and for the wrapping of said suture about said rod.

2. In a surgical stitching instrument comprising a hollow needle-bar, a needle-clamp at one end thereof, and a spool-holder carried by the instrument adjacent said needle-bar remote from said needle-clamp and carrying a spool of suture; the improvement which consists in the provision in said needle-bar of a helical slot extending through the wall thereof from adjacent said spool-holder to adjacent said needle-clamp and providing for laterally passing a suture, drawn from said spool, into and out of said needle-bar at axially spaced points, and means including elements disposed internally and externally of said needle-bar for confining a portion of the length of the suture within the needle-bar.

3. In a surgical stitching instrument having a hollow needle-bar, a needle-clamp at one end thereof, and a spool-holder located remote from the needle-clamp and carrying a spool of suturing material; the improvement which consists in the provision in said needle-bar of a radial suture inlet aperture adjacent said spool-holder and a radial suture outlet aperture adjacent said needle, said apertures being substantially aligned axially of the needle-bar, and a helical slot in the wall of said needle-bar connecting said apertures to permit a portion of a suture carried by said spool to be passed laterally to the inside of said needle-bar adjacent said spool-holder and laterally to the outside of said needle-bar adjacent said needle, and means within said needle-bar to retain said suture inside said needle-bar intermediate said apertures and to apply a slight tension to said suture.

4. A surgical stitching instrument comprising a hollow needle-bar provided with a helical slot extending through the wall thereof, a spool-holder supported adjacent one end of said slot and at one side of said needle-bar and carrying a spool of suture, a needle-clamp carried by said needle-bar adjacent the other end of said slot, said slot affording means providing for lateral introduction of a suture into said needle-bar adjacent said spool-holder and lateral withdrawal therefrom adjacent said needle-clamp, and a rod extending lengthwise within said needle-bar and spaced from the inner surface thereof and adapted to have the suture wrapped thereabout to hold said suture within said needle-bar intermediate the ends of said slot and to produce a slight tension on the suture.

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