This invention relates to surgical stitching instruments of the type disclosed in my United States Patent No. 2,348,218, May 9, 1944, and which carry 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 certain 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 is 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 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 means for enclosing the suture in its travel from the spool to the needle, thereby to protect the suture and prevent drying and contamination thereof.

With the above and other objects in view, as will hereinafter appear, the invention comprises the device, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawing of a preferred embodiment of the invention, from which the several 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 bottom view of the left end of the instrument shown in Figs. 1 and 2, with the shank of the needle in section.
Fig. 4 is a transverse section taken substantially on the line IV—IV of Fig. 2.
Fig. 5 is a transverse section taken substantially on the line V—V of Fig. 2.
Fig. 6 is a detail perspective view of the left end portion of the needle-bar of the instrument. Fig. 7 is a perspective view of a suture protecting element 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 4 which carries a spool-case 5 in which is rotatably mounted a spool 6. The spool has wound thereon suitable suture 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 6 with which cooperates a moveable clamping jaw 7 to grip the shank 5 of the needle 8. The jaw 7 is carried by a needle-clamp actuating rod 8 (Figs. 4 and 5), which extends through the instrument and which is shifted axially, to cause the jaws to grip the needle, by a manually rotatable nut 18 at the rear end of the handle, also as shown in my above mentioned patent.

To house the suture in its travel from the spool 6 to the needle, thereby to prevent, drying and contamination of the suture, the needle-bar is formed, in one side, with a longitudinal channel 9 which extends from adjacent the spool to the free end of the needle-bar. This channel is normally covered by a portion 10 of a suture protecting element P, preferably of sheet-metal, which is shown detached in Fig. 7. The channel 9 and the overlying portion 10 form a closed channel c (Figs. 4 and 5) extending lengthwise of the instrument and within which the portion of the suture between the spool and the
needle is located. In addition to the portion 10, the element P comprises a longitudinal portion 11 and a plurality of substantially C-shaped strap-like portions 12 surrounding the needle-bar I and connecting the portions 10 and 11. The portion 11 is formed with an intumosed lip 13 which is adapted to slide engage in a groove 14 formed in the needle-bar parallel to the channel 8. Engagement of the lip 13 with the side walls of the groove 14 properly positions the element P on the needle-bar so that the bar 10 closes the channel 9 and also prevents turning of the element P on the needle-bar.

At one end, the element P is formed with a tail-piece 15 adapted to abut one end of the handle or the collar 4 of the spool-bracket 4, thereby to hold the element against axial movement in one direction. Movement of the element in the opposite direction is prevented by the engagement of the strap-like portion 12, at the outer end of the element, with a finger 16 carried by the clamp-jaw 7, which finger also serves as a stop for the shank of the needle, as shown most clearly in Fig. 5. At its rear end, the portion 10 is provided with a pronounced lip 17 which serves to direct the suture into the rear end of the channel 9 as the user pulls the suture toward the front end of the instrument. At its forward end, the portion 10 is provided with a lip 19, under which the suture is drawn to lie completely in the channel 9, and with a finger 20 under which the suture also is drawn to put it in a throat 21 between the finger 20 and the adjacent portion 12; said throat serving as a guide for the suture extending from the channel c to the needle.

When it is desired to disassemble the instrument for the purpose of cleaning and sterilizing, the nut 18 is unscrewed from the end of the needle-clamp actuating rod 8 and that rod, together with the clamp-jaw 7 and needle-stop 16, are withdrawn to the left from the hollow needle-bar 1. The suture protecting element P may then be slid off the free end of the needle-bar, the lip 13 sliding lengthwise of the groove 14.

From the foregoing it will be perceived that this invention has provided simple yet effective means for protecting a suture in its travel from the spool to the needle end, to a large extent, to prevent drying and contain bacteria.

It will also be perceived that, with the present construction, the suture readily may be placed in its protective chamber by a natural drawing action on the suture and without the aid of any wire or other threading implement.

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

1. In a surgical stitching instrument having a needle-bar, a needle secured in one end thereof, and a spool-holder located remote from the needle-holding end of the bar and carrying a spool of suturing material, the improvement which consists in the provision in the outer surface of said needle-bar of a longitudinal channel extending from adjacent said spool-holder to adjacent said needle, and a sheet metal member removably secured to said needle-bar and having a portion overlying said channel and forming therewith a substantially closed suture-housing chamber.

2. In a surgical stitching instrument having a needle-bar, a needle secured in one end thereof, and a spool-holder located remote from the needle-holding end of the bar and carrying a spool of suturing material, the improvement which consists in the provision in the outer surface of said needle-bar of a longitudinal channel extending from adjacent said spool-holder to adjacent said needle, and a member carried by said needle-bar and overlying said channel and forming therewith a substantially closed suture-housing chamber.

3. In a surgical stitching instrument having a needle-bar, a needle secured in one end thereof, and a spool-holder located remote from the needle-holding end of the bar and carrying a spool of suturing material, the improvement which consists in the provision in the outer surface of said needle-bar of a longitudinal channel extending from adjacent said spool-holder to adjacent said needle, and a member removably secured to said needle-bar and having one portion overlying said channel and forming therewith a substantially closed suture-housing chamber.
sists in the provision in the outer surface of said needle-bar of a longitudinal channel extending from adjacent said spool-holder to adjacent said needle, a member slidingly fitted upon said needle-bar and having one portion overlying said channel and forming therewith a substantially closed suture-housing chamber, and another portion at one end thereof engaging a stationary part of the instrument to limit the sliding movement of said member in one direction onto said needle-bar, and an abutment carried by said needle-clamp and engaging the opposite end of said member to prevent accidental movement of said member in the opposite direction.

1. In a surgical stitching instrument having a needle-bar, a needle secured in one end thereof, and a spool-holder located remote from the needle-holding end of the bar and carrying a spool of suturing material, the improvement which consists in the provision in the outer surface of said needle-bar of a longitudinal channel extending from adjacent said spool-holder to adjacent said needle and a groove parallel to said channel, and a sheet metal member removably secured to said needle-bar, said member comprising a plurality of substantially C-shaped straps embracing said needle-bar and a pair of bars secured to the opposite ends of said straps, one of said bars overlying said channel and forming therewith a substantially closed suture-housing chamber and the other of said bars having an inturned lip fitting into said groove to prevent turning of said member on said needle-bar.

JOHN D. KARLE.