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J. D. KARLE

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NEEDLE-CLAMP FOR SURGICAL STITCHING INSTRUMENTS

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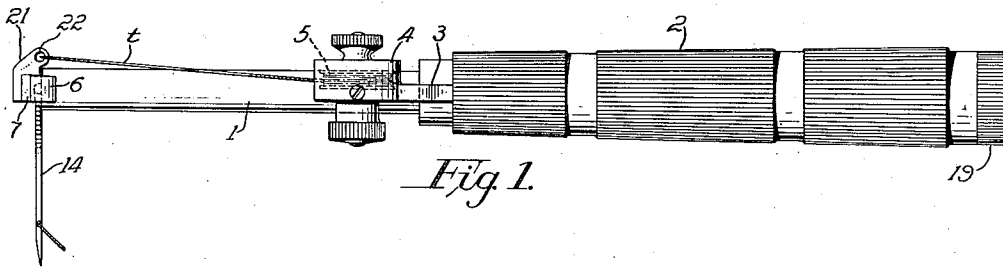


Fig. 1.

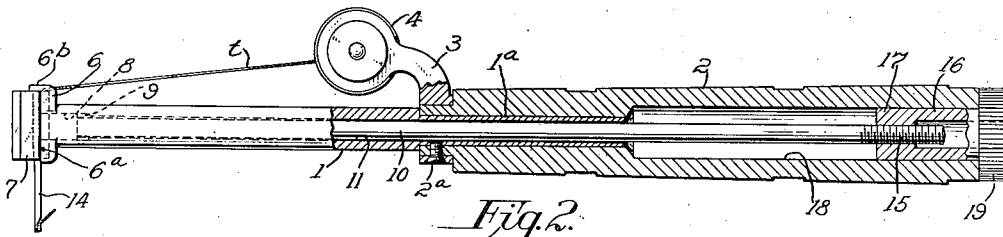


Fig. 2.

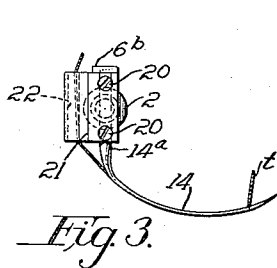


Fig. 3.

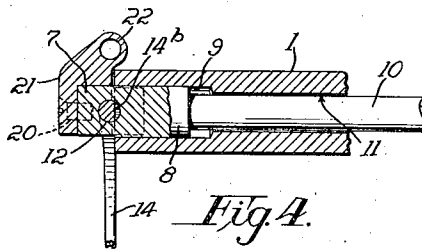


Fig. 4.

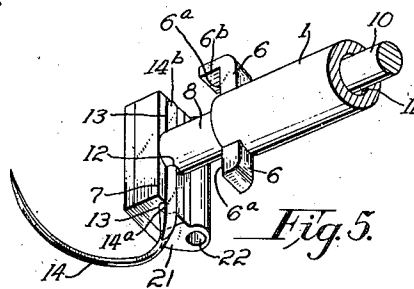


Fig. 5.

Witness:

John H. Cave

Inventor.
John D. Karle

By John F. Heine

Attorney

UNITED STATES PATENT OFFICE

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NEEDLE CLAMP FOR SURGICAL STITCHING INSTRUMENTS

John D. Karle, Roselle Park, N. J., assignor to
The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

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4 Claims. (Cl. 128—340)

This invention relates to means for clamping needles in surgical stitching instruments and it has as a primary object to provide, in a surgical stitching instrument, an improved needle clamping means which will rigidly and firmly hold the needle; which may be conveniently actuated to clamp and release the needle; and which may be actuated from a point remote from the needle-clamp.

These and other objects have been attained by the construction hereinafter described and illustrated in the accompanying drawing in which:

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

Fig. 2 is a longitudinal sectional view, partly in elevation, of the instrument shown in Fig. 1.

Fig. 3 is a left end elevation of the instrument shown in Fig. 1.

Fig. 4 is an enlarged sectional view of the needle-clamping end of the instrument.

Fig. 5 is a partially disassembled perspective view of one end of the instrument showing more clearly the needle-clamping elements.

Referring more specifically to the drawing, the invention is disclosed as embodied in a surgical stitching instrument comprising a main supporting element 1 of tubular form, upon the reduced end 1^a 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 2^a, a bracket 3 which carries a spool-holder 4 in which is rotatably mounted a spool 5 (indicated by dotted lines in Fig. 1). The spool has wound thereon a suitable suture thread *t* for use with the instrument.

At its free end, the supporting element 1 is formed with aligned transversely extending portions 6, the coplanar surfaces 6^a of which constitute a stationary needle-clamping jaw. Cooperating with the stationary jaw is a movable needle-clamping jaw comprising a block-like element 7 formed integral with a cylindrical hub 8, slidingly mounted in a counterbore 9, formed in the outer end of the support 1. The hub 8 is carried by one end of a clamp-actuating rod 10 which is mounted, for endwise movement, in a bore 11, also formed in the support.

At the juncture of the hub 8 and the jaw 7 there is formed a transverse circular bore 12 which, in conjunction with aligned semi-circular grooves 13, formed in the jaw 7, receives the shank 14^a of a curved surgical needle 14. Relative movement between the needle-clamping jaws, axially of the support 1 and under the influence of means later to be described, causes the shank

of the needle to be securely clamped against both rotary and axial movements.

To facilitate proper location of the needle in the needle-clamp, one of the portions 6 of the stationary jaw is formed with an overhanging lip 6^b against which the upper end of the needle-shank is adapted to abut.

The shank of the needle may be slabbled off on one side to form a flat face 14^b adapted to bear against the flat face 6^a of the stationary jaw. This construction is particularly desirable where it is intended that the needle be so held that the blade thereof extends perpendicular to the axis of the instrument, as illustrated in the drawing. While even the flat-shanked needle may be secured in the needle-clamp at various angles other than that shown, it may be desirable, for universal clamping, that the slabbing of the needle-shank be omitted and the shank be made cylindrical.

The clamp-actuating rod 10 is mounted for endwise movement in the bore 11 in the support 1 and the end thereof remote from the needle-clamp is threaded, at 15, to receive a nut 16 comprising an internally threaded cylindrical portion 17, rotatably mounted in a bore 18 in the handle 2, and an enlarged knurled head 19 by means of which the nut may be manually rotated. The head 19 bears against the end of the handle and therefore rotation of the nut, in one direction, on the screw threaded rod 10 will cause that rod to be moved endwise toward the nut thereby effecting clamping of the shank of the needle between the stationary and movable jaws. Opposite rotation of the nut releases the needle.

Secured upon the outer face of the jaw 7, by screws 20, is a block 21 having therein a bore 22 which serves as a thread-guide to receive the suture thread *t* from the spool 5 and direct it tangentially into a thread-groove on the convex side of the needle.

From the foregoing it will be perceived that this invention has provided a needle-clamp for surgical stitching instruments which quickly and easily may be actuated from the end of the instrument remote from the needle to clamp the needle in any angular position relative to the instrument. Likewise, that the clamp may be readily released for the purpose of removal or replacement of the needle.

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

1. In a surgical stitching instrument comprising a tubular supporting element, a hollow handle at one end thereof and a needle carried at

the other end thereof; a needle-clamp comprising a stationary needle-clamping jaw at that end of the supporting element remote from the handle, said stationary jaw having a flat abutment surface arranged transversely of the axis of said supporting element and adapted to engage a flat surface at one side of the shank of the needle, a cooperating movable needle-clamping jaw adjacent said stationary jaw and having an arcuate surface directly opposed to said flat abutment surface and adapted to engage the opposite side of the shank of the needle to grip said shank by a compression force, and means connected to said movable jaw and extending through said supporting element and handle for actuating said movable jaw to effect clamping of the needle in a predetermined angular position.

2. In a surgical stitching instrument comprising a tubular supporting element, a hollow handle on one end thereof and a needle carried at the other end thereof; a needle-clamp comprising a stationary needle-clamping jaw at that end of the supporting element remote from the handle, said stationary jaw having a flat abutment surface arranged transversely of the axis of said supporting element and adapted to engage a flat surface at one side of the shank of the needle, a cooperating movable needle-clamping jaw adjacent said stationary jaw and having an arcuate surface directly opposed to said flat abutment surface and adapted to engage the opposite side of the shank of the needle to grip said shank by a compression force, a thread-guide carried by one of said jaws for directing suture thread to the needle held in the needle-clamp, and screw-actuated means connected to said movable jaw and extending through said supporting element and handle to the free end of the latter for actuating said movable jaw to effect clamping of the needle in a predetermined angular position.

3. In a surgical stitching instrument including a supporting element, a handle at one end thereof, a needle-clamp carried by the other end of said supporting element, a curved eye-pointed needle having a straight shank secured in said

needle-clamp, a thread-guide carried by said needle-clamp for directing thread from a spool carried by the instrument to said needle, said needle-clamp comprising a stationary needle-clamping jaw having two flat abutment surfaces arranged at opposite sides of the axis of said supporting element and transversely thereof, a cooperating movable needle-clamping jaw having a needle-shank receiving groove formed therein adjacent the fixed abutment surfaces of the other jaw, the wall of said groove being directly opposed to said fixed abutment surfaces, and screw-actuated means extending through said supporting element and handle and operable from the free end of the handle for actuating said movable clamping jaw.

4. In a surgical stitching instrument including a tubular supporting element, a hollow handle secured on one end thereof and substantially coaxial therewith and a curved eye-pointed needle carried at the other end thereof; a needle-clamp for holding said needle comprising a stationary needle-clamping jaw carried by the other end of said supporting element and extending transversely thereof and having flat needle abutment surfaces arranged at opposite sides of the axis of said supporting element and transversely thereof, a cooperating movable needle-clamping jaw located adjacent to said fixed jaw and having a transverse needle-shank-receiving groove formed therein at the side thereof facing the other jaw and affording needle-shank engaging surfaces directly opposed to the needle abutment surfaces of said stationary jaw, a needle-clamp actuating rod secured to and projecting laterally from said movable jaw and through said supporting element into said handle and having its free end threaded, a clamp-actuating nut located at the free end of said handle and comprising a cylindrical internally threaded portion projecting into said handle and threaded onto said rod and an enlarged outer portion engaging the end of said handle, and a needle-stop carried by one of said needle-clamping jaws and engaging the shank end of the needle to position the needle in the needle-clamp.

JOHN D. KARLE.