April 13, 1948. L. H. ERICKSON 2,439,383

SURGICAL STITCHING INSTRUMENT

Filed July 19, 1946

Fig. 1

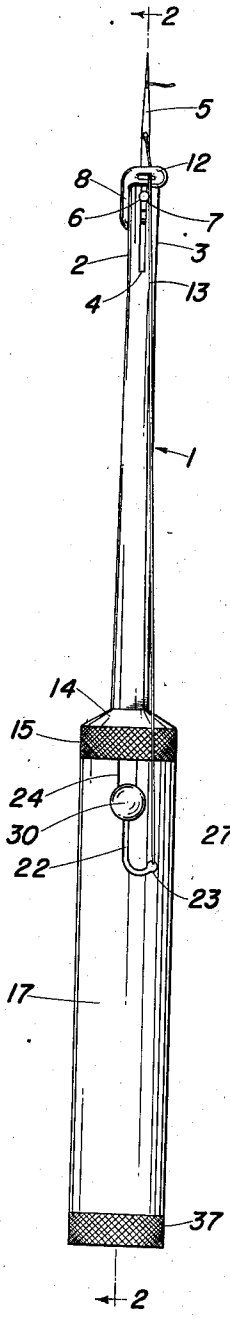


Fig. 2

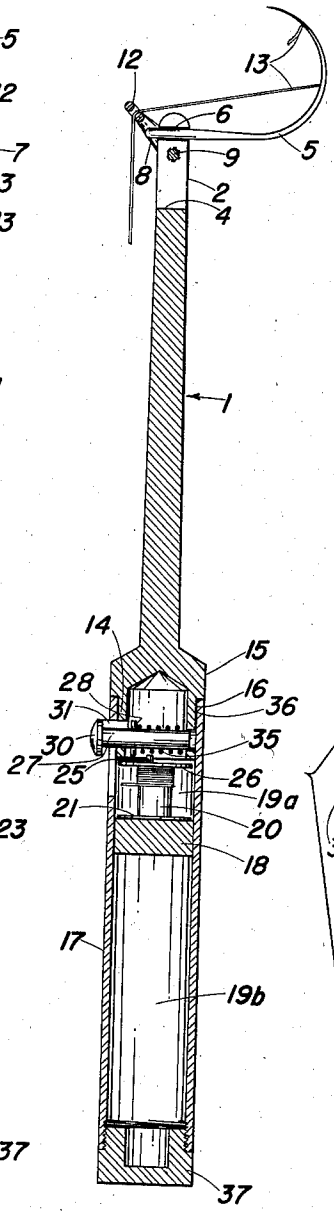


Fig. 3

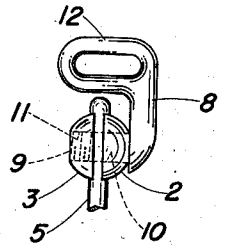
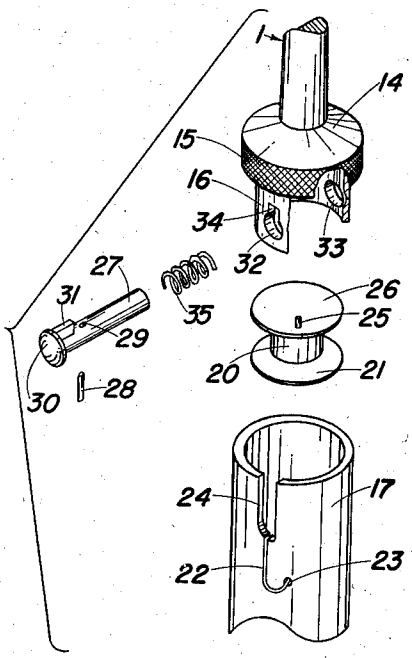


Fig. 4



INVENTOR.

Lester H. Erickson

BY

ATTORNEY

Patented Apr. 13, 1948

2,439,383

UNITED STATES PATENT OFFICE

2,439,383

SURGICAL STITCHING INSTRUMENT

Lester H. Erickson, Los Angeles, Calif.

Application July 19, 1946, Serial No. 684,906

2 Claims. (Cl. 128—340)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

This invention relates to surgical stitching instruments and more particularly to surgical stitching instruments for suturing during surgical operations.

Objects of this invention are to provide a surgical stitching instrument having means for easily adjusting and retaining a stitching needle in various positions of adjustment; to provide means compactly contained within the instrument for continuously supplying suture material to the needle; to provide convenient manually operable means for controlling the supply of suture material to the needle; to provide means for storing within the instrument spare units of suture material; and to provide an instrument of the type described which is of simple, durable, and inexpensive design and which is readily demountable for loading and cleaning.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is an elevational view of the stitching instrument.

Fig. 2 is a cross-sectional view of the instrument of Fig. 1 taken along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged detail view showing the needle clamping means; and

Fig. 4 is a fragmentary exploded detail view of the device showing the braking mechanism for the thread spool.

Referring more in detail to the drawing:

Numeral 1 indicates generally a stem preferably made of stainless steel, as are all the metal parts of the instrument, to facilitate sterilizing. The outer or free end of the stem 1 is split or bifurcated to provide a pair of prongs 2 and 3. This may be accomplished by cutting a slit 4 in the end of the stem 1. The prongs 2 and 3 are adapted to hold a stitching needle 5. To facilitate gripping of the needle 5 by the prongs, opposed grooves 6 and 7, respectively, in the prongs 2 and 3 are provided in the form of sections of a circular cylinder having its axis perpendicular to the longitudinal axis of the stem and included in the plane of the slit 4. The opposed grooves 6 and 7 may constitute the residuum of a cylindrical opening pierced through the stem 1 prior to the cutting of the slit 4.

The needle 5 may be caused to assume various positions by sliding it longitudinally of its axis between the prongs 2 and 3 and by rotating it about its longitudinal axis. To retain the needle in adjusted position a clamping lever 8 is used.

2

The lever 8 is provided with a screw portion 9 passing freely through a cylindrical opening 10, Fig. 3, extending transversely through prong 2 and threadedly engaging an opening 11 in prong 3 coaxial with the opening 10. The clamping lever 8 is also provided with an eye portion 12 to serve as a guide for suture material or thread 13 supplied to the needle 5. An enlarged cylindrical portion 14 is formed on the stem opposite the slitted end thereof having an externally knurled surface 15 to facilitate manipulation and an annular part 16 adapted for frictional engagement with a handle 17.

The handle 17 is generally tubular and is provided with a press fit plug 18 adjacent one end thereof dividing the handle generally into two chambers 19a and 19b, Fig. 2. The chamber 19a is adapted to receive a spool 20 of suture material or thread whose lower flange 21 rests on the plug 18. The spool 20 may be designated as an active spool since it is actually used during the operation of the device to supply thread to the needle 5. The chamber 19a is so dimensioned that the spool 20 is readily rotatable therein. To facilitate feeding of the thread 13 from the spool 20 to the needle 5 a substantially J-shaped slot 22 is cut through the wall of the chamber 19a. The slot 22 has a circular opening 23 at the tip of the hook of the J and has an enlarged section 24 on the leg of the J for a purpose hereinafter described.

To prevent undesired rotation of the spool 20, a brake mechanism is provided therefor in the form of a pin 25 projecting from the upper flange 26 of the spool 20 and a manually operable brake member 27 having a pin 28 therein cooperating with the pin 25. The pin 28 is retained by a tight fit in an opening 29, Fig. 4, extending transversely through the brake member 27. The member 27 is generally cylindrical and has a finger operated button 30 formed on one end thereof adjacent to which is a key portion 31, also preferably formed integral with the member 27. The member 27 is reciprocably mounted in coaxial openings 32 and 33 extending transversely through the annular portion 16 of the stem 1. To prevent undesired rotation of the member 27 about its longitudinal axis the opening 32 is formed to include a keyway 34 cooperating with the key portion of the member 27. The brake member 27 is biased into braking position by means such as a coil spring 35 surrounding the member 27 and bearing against the internal surface of the annular portion 16 and against the pin 28. The enlarged portion 24 of the J slot 22

is of such size as to permit free reciprocation of the member 27 when the handle 17 is applied to the stem 1 by a friction fit at the joint 36, Fig. 2.

The chamber 19b serves as a storage space for extra or inactive spools of suture material or thread, access thereto being afforded by the provision of a knurled cap 37.

Operation

To use the instrument of the present invention any desired one of a plurality of different sized stems 1 is chosen. The shank of a needle 5 is inserted in the opening between the grooves 6 and 7 and the needle is positioned longitudinally and rotationally into any desired attitude. The needle is locked and retained in this attitude by rotating the clamping lever 8 which squeezes the prongs 2 and 3 together against the needle, gripping it tightly. The attitude of the needle may be changed at any time without removing the needle by merely loosening the clamping lever, adjusting the needle, and re-tightening the lever.

A spool 20 of suture material or thread is obtained and the end of the thread passed through the eye 12 of the clamping lever 8 and thence through the eyes of the needle 5. The spool 20 is then inserted in the chamber 19a of the handle 17 and the thread 13 is guided through the J slot 22 until it finally emerges through the circular opening 23. The handle 17 is then applied to the stem 1 establishing a friction connection at 36 sufficiently tight to prevent movement or accidental withdrawal of the stem 1 from the handle 17.

The spring 35 bears against the pin 28 forcing the member 27 outward so that the pin 28 abuts the pin 25, thus serving as a brake to prevent any appreciable rotation of the spool 20. The instrument is now ready for stitching.

The handle 17 is grasped and the device used to perform the operation in place of the forceps usually required to hold a needle. As additional thread is required the button 30 is depressed displacing the pin 28 from its abutment with the pin 25 and permitting free rotation of the spool 20 to pay out additional thread 13 as needed. The release of pressure on the button 30 permits the spring 35 to return member 27 to braking position.

To facilitate sterilizing, the stem 1 and handle 17 are easily separated and the plug 37 removed so that all parts may come in contact with sterilizing fluid.

While I have shown but one embodiment of my invention, it is apparent that the device is susceptible to modification without departing from the spirit of the invention. I do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A surgical stitching instrument comprising a stem, said stem having a generally cylindrical opening extending therethrough adjacent one end thereof adapted to receive the shank of a needle, said stem having a longitudinal slit formed in said end in a plane including the axis of said stem and the axis of said cylindrical opening to render said end bifurcated into a pair of prongs for gripping said needle, one of said prongs having a screw threaded opening therethrough transversely of said slit, the other of said prongs having an opening therethrough coaxial with said screw threaded opening and of larger diameter, a needle clamping lever having an eye portion and a screw portion, said screw portion passing through said last mentioned opening in one of said prongs and engaging said screw threaded opening in the other of said prongs, said stem having at its end opposite said slit an enlarged cylindrical portion, a generally tubular handle adapted at one end for frictional engagement with said enlarged cylindrical portion of said stem and having at its other a removable cap closing a chamber adapted for the storage of spools of thread, said handle having a second chamber therein adjacent said stem for retaining a spool of thread rotatably therein, an active spool of thread in said second chamber, said second chamber having a generally J-shaped guide slot in the wall thereof adapted to guide thread from said active spool toward said needle, and a brake mechanism for said spool located substantially entirely within said handle comprising a manually operable brake member reciprocably mounted in said stem and adapted to engage said active spool, and spring means biasing said brake member to prevent rotation of said active spool.

2. A surgical stitching instrument comprising a stem, said stem having a pair of prongs at one end thereof adapted to grip a needle, means for clamping said prongs together to retain said needle in various positions of adjustment, a removable handle adapted for friction fit with said stem, said handle having a chamber for retaining a thread spool rotatably therein, said chamber having an opening through its wall whereby thread may be continuously supplied from said spool to said needle, and manually releasable spring-biased means for preventing rotation of said spool, said brake means being substantially enclosed within said handle with only the manually operable portion thereof protruding from said handle.

LESTER H. ERICKSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
374,372	King	Nov. 15, 1887
1,579,379	Marbel	Apr. 6, 1926

OTHER REFERENCES

Singer Surgical Stitching Instrument Catalogue (copyright 1942), page 8.