July 16, 1935. H. HILLEBRAND 2,008,251

SURGICAL INSTRUMENT

Filed Dec. 14, 1933

Fig. 1

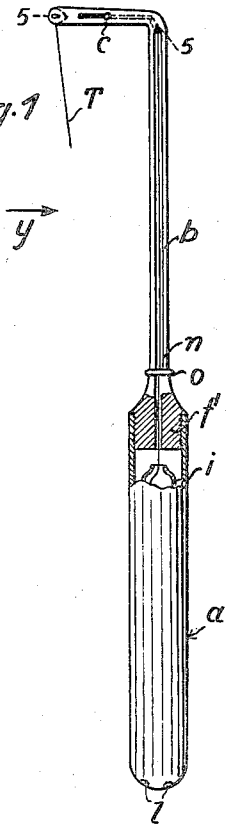


Fig. 2

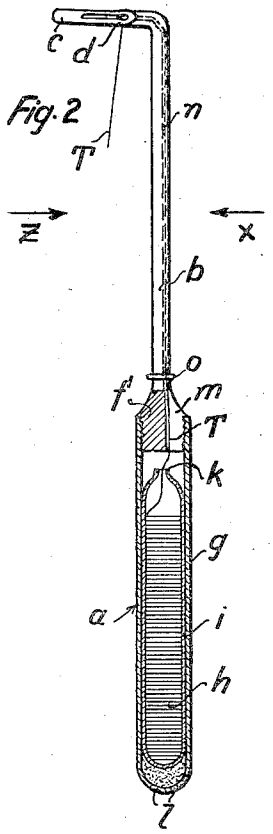


Fig. 3

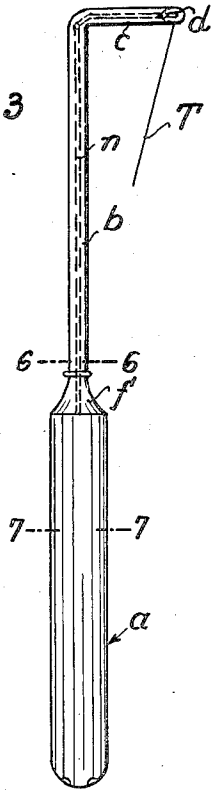


Fig. 4

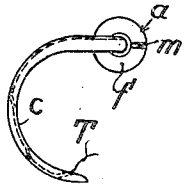


Fig. 5

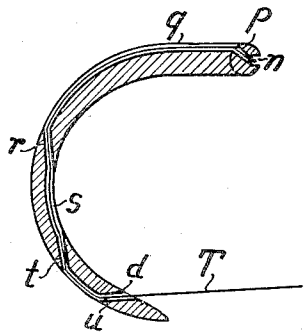


Fig. 6.

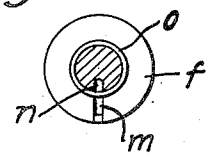
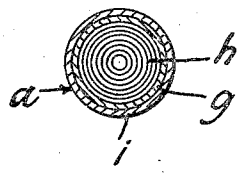


Fig. 7.



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per
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2,008,251

UNITED STATES PATENT OFFICE

2,008,251

SURGICAL INSTRUMENT

Hubert Hillebrand, Aachen, Germany

Application December 14, 1933, Serial No. 702,401
In Germany December 14, 1932

2 Claims. (Cl. 128—339)

This invention relates to a piercing and ligation instrument for use in surgical operations, and it has more particularly reference to instruments of the kind in which the piercing hook has a blunt point for avoiding bleedings and is provided with a thread eye near its point. The instrument is essentially designed to be used for operations of special character such as resections of the stomach and intestines and bronchocele operations.

With the known instruments of this kind, a separate length of thread must be threaded into the eye for each ligation. In the above indicated operations the tissue has usually to be pierced and tied from twenty to fifty times in very rapid succession, and it will be understood that the assistant who has to thread the instruments and hand them to the surgeon is scarcely able to perform the necessary manipulations with the requisite quickness so that disturbances in the progress of the operation are almost unavoidable.

It is one of the objects of the invention to overcome this drawback by providing the instrument with a thread spool from which the thread can be continuously supplied to the eye at the end of the piercing hook.

Another object of the invention resides in providing the piercing hook and the shank with grooves and ducts for properly guiding the thread from the spool to the eye and for preventing the thread from being accidentally withdrawn from the eye during the operations.

The invention further consists in mounting the thread in the form of a bobbin in an aseptic ampoule which is removably placed in a hollow handle detachably carried by the shank of the instrument.

I am aware that surgical needle holders with a thread spool and an aseptic thread guide are already known. But these known instruments are not like the present one, by means of which the surgeon pierces the flesh or tissue blunt for avoiding bleeding, but they are sewing or piercing hooks with a needle which has a stinging effect by its point and sometimes even a cutting effect by one of its sides, so that bleeding is unavoidable. One of these instruments has the needle clamped between two adjustable cheeks. The known instruments consist of five or seven parts and are very complicated. Their needle has no thread guiding grooves and ducts but only an eye near the point. These known instruments are unsatisfactory in actual practice by reason of their complicated construction and the lack of a proper thread guide.

The blunt ligation instrument according to the invention fully answers all requirements for special operations, such as resections of the stomach and intestines and bronchocele operations. It consists only of two parts, is very simple to handle and allows the surgeon to work with it without any disturbances.

The accompanying drawing illustrates, by way of example, an embodiment of the instrument.

Fig. 1 is an elevation, partly in section, of the instrument seen in the direction of the arrow *x*, Fig. 2;

Fig. 2 is a similar elevation seen in the direction of the arrow *y*, Fig. 1;

Fig. 3 is an elevation seen in the direction of the arrow *z*, Fig. 2;

Fig. 4 is a plan view of the instrument;

Fig. 5 is a section on the line 5—5 of Fig. 1, on an enlarged scale;

Fig. 6 is a section on the line 6—6 of Fig. 3, and

Fig. 7 is a section on the line 7—7 of Fig. 3.

The instrument comprises a handle *a*, a shank *b* and a piercing hook *c*. The shank *b* and the hook *c* are made of one piece. The hook *c* extends from the upper end of the shank *b* at a right angle thereto. It has a substantially semi-circular shape and a blunt point with an eye *d*.

The shank *b* has at its lower end an enlargement *f* with external screws threads with which are engaged corresponding internal threads in the upper end of a sleeve *g* constituting the handle *a*. The hollow space of the handle *g* is designed to receive a thread supply spool *h*. The spool is in the form of a bobbin which is mounted in an ampoule *i* containing an aseptic liquid and removably placed in the hollow handle *g*. Prior to the insertion of the ampoule into the handle its tip is broken off to form an outlet *k* for the thread T. The handle *g* has in its lower end small holes *l* which allow air to pass in and out of the handle, thus permitting an easy insertion and removal of the ampoules.

The shank enlargement *f* has a longitudinal passage *m* through which to pass the thread from the handle to the outside. The passage *m* merges into a thread guiding groove *n* in the shank *b* extending longitudinally thereof. A ring *o* encircling the lower end of the shank holds the thread in the groove *n*. At the upper end of the shank *b*, where the hook *c* commences, a thread duct *p* extends from the front side of the shank to the rear side of the hook. This

duct *p* is continued on the rear side of the hook by a groove *q*, to which is connected a duct *r* extending to the front side of the hook and merging there into a groove *s* which is again continued by a duct *t* leading to the rear side of the hook, where another groove *u* completes the connection with the eye *d*. The grooves and ducts *m n p q r s t u* guide and hold the thread on its path from the handle *g* to the eye *d*. The thread T leaves the piercing hook *c* and more particularly its eye *d* at the front side of the hook. The thread is guided and covered at and in the hook in such a manner that it cannot be seized at the wrong side and accidentally withdrawn from the eye during the operation.

The instrument is used as follows: Before an operation begins, an aseptic ampoule containing a thread spool is placed in the handle and the thread is passed through the successive grooves and ducts and threaded in the eye, as illustrated in the drawing, whereupon the instrument is ready for use. The portion of the body to be tied is pierced with the hook *c* in the usual manner, the free end of the thread is seized, the instrument withdrawn and the thread cut by an assistant at the desired length from the eye so that the end of the thread coming from the spool remains well in the eye. Thus the instrument remains ready for the next piercing and tying action and threading for each action is dispensed with.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a surgical needle, a shank, a curved blunt piercing hook at one end of the shank in a plane perpendicular to the axis of the shank, a hollow handle detachably connected to the opposite end of the shank and adapted to receive a thread bobbin, the shank being formed with a longitudinal externally opening thread guiding groove, the hook being formed with successive externally opening thread guiding grooves, means for holding the thread in the grooves of the shank, and means for holding the thread in the grooves of the hook.

2. In a surgical needle, a shank, a curved blunt piercing hook at one end of the shank in a plane perpendicular to the axis of the shank, and a hollow handle connected to the opposite end of the shank and adapted to encase a thread bobbin, the shank being formed with a externally opening thread guiding groove extending throughout the length of the shank, the hook being formed with a plurality of externally opening thread guiding grooves arranged alternately on opposite sides and in succession to each other, the hook being further formed with thread guiding ducts intermediate and communicating with the ends of successive grooves, said ducts establishing communication between and holding the thread in the several grooves of the hook.

HUBERT HILLEBRAND.