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[54] SURGICAL KNIFE

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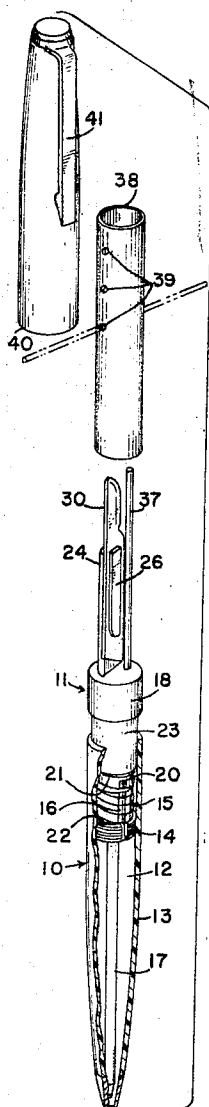
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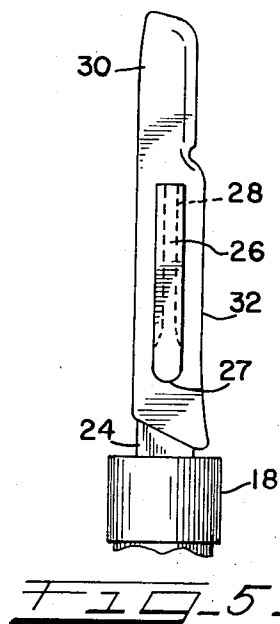
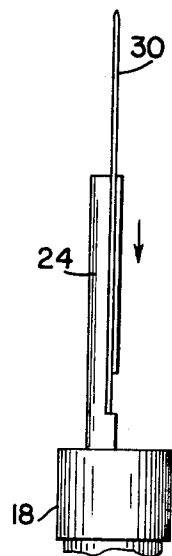
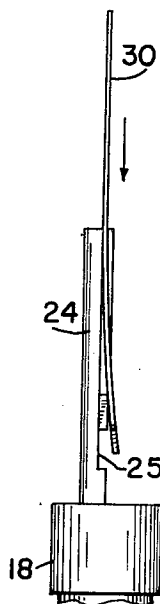
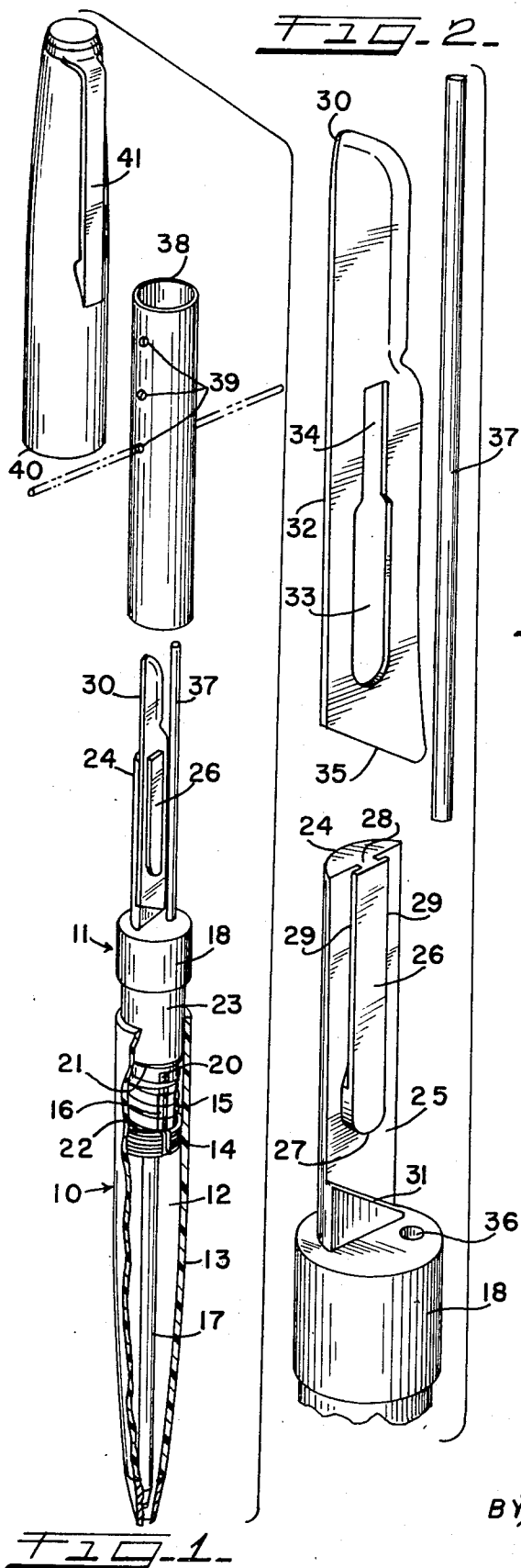
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[57] ABSTRACT

A surgical knife including a base portion having an element removably mounting a surgical steel blade and a removable pin guard for the knife edge and point with a cylindrical tube removably surrounding the knife and pin and having a removable protective cover for the assembly. The base portion is adapted for connection with a utilitarian article and preferably one normally carried on the person.

3 Claims, 5 Drawing Figures





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SURGICAL KNIFE

BACKGROUND OF THE INVENTION

The invention relates to a surgical knife for use by medical doctors and which is always available when an emergency is encountered. It is a well known fact that it becomes necessary frequently for a tracheotomy to be performed immediately, or an emergency appendectomy, or open-heart massage may be necessary, all without benefit of hospital or other facilities where instruments and accommodations for complete care are available. In such emergencies a doctor may be called upon to act immediately in order to save a life, and it is essential that he be possessed at all times with a suitable instrument and equipment for the purpose.

OBJECTS OF INVENTION

The principal object of this invention, therefore, is the provision of a doctors surgical steel knife that is always available to him for use, and which is mounted in association with a utilitarian article of a generally personal nature and preferably one that is usually carried on the person.

It is an object of the invention to combine a doctors surgical knife assembly with a utilitarian article that may be carried in the pocket.

Another object of the invention is to provide a surgical knife assembly having a removable surgical steel blade for replacement or sharpening.

Still another object of the invention is the provision of a surgical knife assembly including a base member, a blade mounting extension, a surgical steel blade removably mounted on the extension, and a cylindrical tube enclosing the blade and the extension on the base.

A further object of the invention is the provision of a surgical steel knife assembly, including a base having a pin socket and a blade mounting extension, a blade on the extension and a pin in the socket and a cylindrical tube surrounding the extension, blade and pin, with a cover for the assembly.

A still further object of the invention is to provide a surgical steel knife assembly mounted on a base wherein the base is adapted for mounting in association with a utilitarian article which article serves as a handle for using the knife.

A more specific object of the invention is the provision of a surgical steel knife assembly for use in emergencies, and which includes a mount, a blade on the mount, a pin, and a cylindrical tube all supported on a base and wherein the tube and pin are removable and the pin is insertable through transversely aligned holes in said tube.

A further specific object of the invention is to provide a surgical steel knife assembly including a base, a blade mount on the base, a blade on the mount, a pin socket in the base, and a pin in the socket, with the pin extending in spaced parallel relation to the edge of the blade and beyond the point thereof to act as a blade guard.

DESCRIPTION OF THE DRAWINGS

The foregoing and other objects of the invention will become apparent as the description proceeds and when taken in conjunction with the accompanying drawings wherein

FIG. 1 is an exploded perspective view of the surgical knife assembly as mounted in association with a ball-point pen;

FIG. 2 also is an exploded perspective view showing the several parts of the surgical steel knife assembly with the surgical steel blade and pin member removed from their associated elements;

FIG. 3 is an edge elevational view of the blade mount illustrating the blade partially mounted thereon with the blade in an intermediate position before reaching its final installation;

FIG. 4 also is an edge elevational view similar to FIG. 3 showing the steel blade in its final position on the mount; and

FIG. 5 is an elevational view of the blade and mount showing the face of the blade as installed on the mounting element.

SUMMARY OF THE INVENTION

The surgical knife arrangement includes a base portion, a mounting element for the knife blade, a removable knife blade, a plastic or non-metallic cylindrical tube having the multiple purpose of serving as a cover or guard for the knife blade and which may be removed from the knife and inserted in the trachea between the larynx and the bronchia, a removable steel pin or rod which also serves a multiple function of providing a guard for the knife edge and for the knife point when mounted in the base portion and also may be used to locate or fix the position of the plastic tube in the trachea. A removable cover normally protects the entire assembly. The knife blade is slotted and is slidably insertable over a complementary projection on the mounting element with which it interlocks against accidental or inadvertent removal. The projection for a portion of its length is provided with an underlying portion of reduced section capped by oppositely extending shoulders. The blade slot has a portion of its length of a width to fit over the maximum width of the projection and a portion of its length is of reduced width complementary to the reduced section area of the projection and which is adapted to slide onto such reduced section area of the projection beneath the shoulders and is adapted to fit beneath and be retained in position by the shoulders. The reduced width slot portion fitted on the complementary reduced section of the projection maintains the alignment of the blade. The relatively wider slot portion fits over the maximum width of the projection and springs over the rounded rear end thereof to lock the blade on the base portion. The surgical steel blade is thus readily removable and replaceable, but it is rigidly and securely maintained in operative position on the mounting element and in alignment lengthwise of the mounting element perpendicular to the base portion. The entire assembly may be sterilized and the cylindrical plastic tube will protect the knife and pin against outside contact until used and a removable cover protects the entire assembly against outside conditions. The base for the assembly is provided with means whereby the base may be connected with a utilitarian article and this article may serve as a handle for manipulating the surgical knife in use.

This surgical steel knife is intended primarily as an emergency instrument and is proposed for use in those instances where the patient requires immediate surgical

procedure in advance of full medical attention at a hospital or the like. In order to insure that the emergency knife will always be available when the need arises it is combined with a utilitarian article that is normally carried on the person, and preferably an article such as a doctor would usually carry in his pocket. The surgical knife is disclosed herein as associated with a pocket type pen of the ballpoint variety but this is only by way of example and can be associated with various other articles that would normally be carried in a man's pockets or on the person. Also, by way of example only, the surgical steel knife might be mounted in association with a pencil or a pencil attachment such as a lengthener, a pocket comb, or a pocket knife, a key or key holder, spectacles or a spectacle case, a money clip or container, or it might be associated with the container in which a doctor carries a thermometer. Various other articles may also be adaptable for association with the knife but it is important that any such article be one that would normally be carried on the person or one that a doctor would likely carry at all times.

DESCRIPTION OF PREFERRED EMBODIMENT

In the drawing 10 represents a surgical knife and writing pen combination constructed in accordance with this inventive concept. The surgical knife assembly is identified generally at 11 and the writing pen which is a typical ball point type is indicated at 12. The pen includes a barrel 13 which is threaded onto an end member 14. A replaceable filler or cartridge 17 for the ball point pen is mounted in the end member 14 and extends centrally through the barrel 13 in the usual manner for pens of this type and is retractable also in the usual manner. A spring 15 functions both in retracting the ball point within the barrel 13 and in propelling the ball point beyond the barrel for writing prescriptions or the like. Spring 15 surrounds the end-member 14 and is mounted between a spring seat 22 on the end-member and a spring seat 21 on the base portion 18 of the knife assembly 11. The base portion 18 has an open end for receiving the end-member 14 of the pen assembly within the hollow stem portion 23 which is of smaller diameter than the main base element 18. The threaded end-member 14 is provided with a milled channel section guideway 16 at one side running lengthwise of the member and when the end member has been inserted in the open end of the base stem portion 23 an indentation 20 is formed in the side wall of the hollow stem guideways 16 to secure the end member in operative relationship to base 18. The indentation 20 projects into the guideway and serves also to guide the end member 14 and thus the barrel 13 against turning as the ball point is propelled and retracted against the force exerted by the spring 15. The foregoing is typical of the construction and operation of most ball point type writing pens.

The surgical knife base element 18 comprises the central supporting structure from which both the ball point pen 12 and the surgical knife assembly 11 extend in opposite directions and to which they are mounted with the knife assembly forming a cooperative part of the base whereby the pen or the pen barrel 13 may be utilized as a handle when using the knife. The base 18 has an integrally formed blade mounting element or extension 24 which extends outwardly from the base in a

direction opposite to that of the pen assembly 12. The extension 24 has a flat face 25 on one side, which as shown, is disposed approximately in line with the axis through the assembly combination 10. Since the surgical steel blade 30 is mounted on this face, this location has the effect of giving the knife the best possible balance for handling while in use. In order to mount the blade 30 securely to the extension 24 a lateral projection 26 stands outwardly from the face 25 and the blade is secured to this projection.

The projection 26 is of substantial length relative to the extent of the mounting element 24 and is rounded at its rearmost end as at 27 while the opposite or front end is squared off for a purpose which will now appear. For a substantial portion of its length extending rearwardly from its squared front end the projection 26 is undercut as provided by the reduced section 28 which provides oppositely extending shoulders 29. The surgical steel blade 30 is provided with a relatively wider mounting portion 32. A lengthwise mounting slot 33 is provided in the area of this mounting portion of the blade and a reduced width portion 34 of the slot is approximately coextensive with the length of the undercut reduced section 28 of the mounting element 24. The slot portion 34 of reduced width extends from the front end thereof, which is squared off to complement the square end of projection 26 at this point, for approximately the same length as that of the reduced section 28 and is adapted to be slid on to the undercut reduced section 28 beneath the shoulders 29. The square end of this slot portion abuts the squared end of the projection 26 in the final mounting position.

The rounded rear end of the slot fits closely around the rounded rear end 27 of the projection and snaps into this position as the blade is slid home to its final position. As the blade is slid onto the projection 26 from the front end the rear portion of the blade 30 behind the narrow slot portion 34 is sprung upwardly to permit the wider portion of the slot to pass over the shoulders 29 and the full width rear portion of the projection. When the final position is reached the spring pressure inherent in the blade causes it to snap downwardly around the projection 26. The relatively wider rear blade portion 32 is provided with an angled rear edge 35. A complementally angled abutment 31 on the face 25 of the mounting element engages the blade rear edge thus effectively preventing the blade from shifting lengthwise on the mounting element. The engagement of the slot portions 33 and 34 over the projection 26 and particularly the narrow slot portion 34 in engagement with the undercut reduced section 28 prevents any angling movements of the blade on its mounting while the shoulders 29 hold the blade tightly against the face 25. The surgical steel blade thus is rigidly maintained in operative position and the cutting portion of the blade extending beyond the blade mounting member 24 is maintained at maximum steadiness for precision use.

The base 18 is provided with a pin socket 36 and a pin or rod 37 is removably mounted in this socket. The socket is so located in the base that the rod 37 extends parallel to and generally adjacent to the cutting edge of the surgical steel knife blade thus acting as a guard to protect the knife edge and also prevent accidental contact with the edge when handling the various parts of

the knife assembly. The rod 37 extends beyond the end of the knife blade thus also protecting the point of the knife. A cylindrical tube 38 surrounds and is removably mounted over the blade 30 and its mounting element 24 and the rod 37 inserted in the socket 36 so that these parts are enclosed within the tube when thus assembled. The cylindrical tube may be made of plastic and is provided with a series of transversely aligned holes 39 at longitudinally spaced intervals through opposite walls thereof and of a size to take the rod 37 which may be inserted therethrough when the tube 38 and the rod are both removed from their assembled position on the base 18. This enables placement of the tube 38 in the trachea through an incision made with the knife and insures that the tube will remain properly placed since the pin 37 inserted through the holes 39 prevents its shifting once it has been placed.

When all of the parts are assembled on the base a removable cover 40 may be placed over the assembly and engaged on the base 18. This cover is made to fit the base portion 18 tightly enough to hold in place by friction but the opening therein that thus fits the base is too large to fit the ball point pen portion 12 so that the cover cannot accidentally be placed on the pen and leave the surgical knife exposed. Therefore, the exposed knife cannot be placed in the pocket since it is not possible to apply the cover in other than its proper position over the knife assembly onto the base 18. The cover is provided with a spring clip 41 to support and securely hold the knife in a pocket.

The surgical knife of this invention may be used for emergency surgery such as a tracheotomy, open heart massage, appendectomy or any operation where it must

be performed immediately before proceeding to a hospital or other place where medical facilities are available and emergency care may be had.

Although a particular embodiment of the invention has been illustrated and described, it will be understood that various modifications may be made without departing from the spirit and scope of the invention as defined by the appended claims.

The embodiments of this invention in which an exclusive property or privilege is claimed are defined as follows:

1. A utilitarian article including a surgical knife assembly comprising a base portion having a lengthwise extending blade mounting element, a surgical steel blade removably secured on said mounting element, a cylindrical tube surrounding said mounting element and steel blade, a protective cover for the assembly, removably connected with the base portion, said base portion having means for connection with the utilitarian article, said base portion having a pin socket, a lengthwise extending pin in said socket positioned along the cutting edge of said blade, and said cylindrical tube surrounds the mounting element, steel blade and said pin.

2. The surgical knife assembly of claim 1 wherein said pin mounted in said socket extends parallel to the edge of said blade and beyond the point of the blade.

3. The surgical knife assembly of claim 1 wherein said cylindrical tube is provided with a series of laterally extending pairs of aligned holes through the walls thereof in longitudinally spaced relation, and said pin is disposed through an aligned pair of such holes.

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