July 26, 1966 T. R. ARDEN 3,262,205

SCALPEL

Filed Jan. 21, 1964

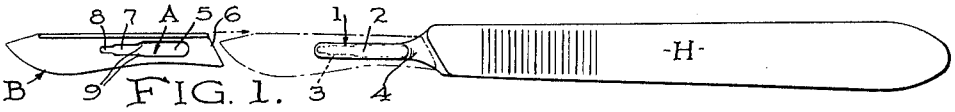


FIG. 1.
PRIOR ART

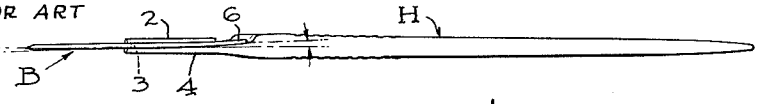


FIG. 2.
PRIOR ART

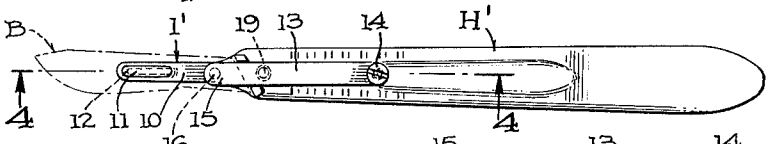


FIG. 3.

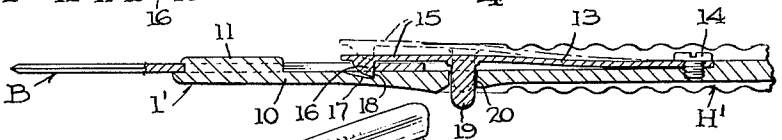


FIG. 4.

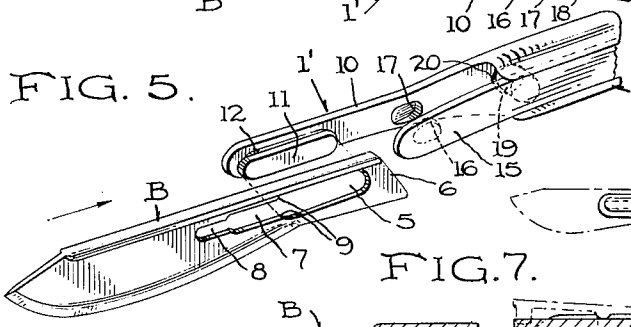


FIG. 5.

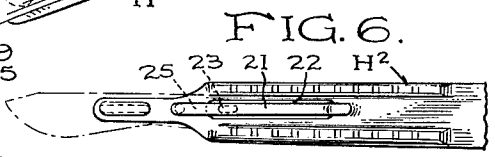


FIG. 6.

FIG. 7.

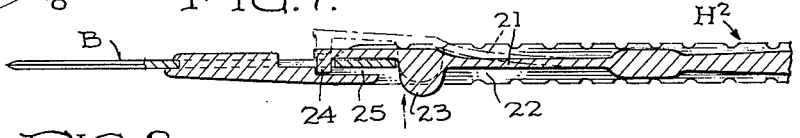


FIG. 8

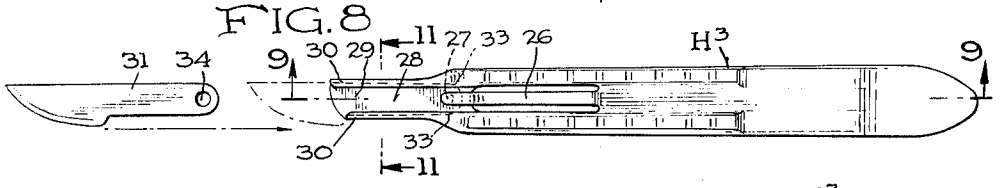


FIG. 9.

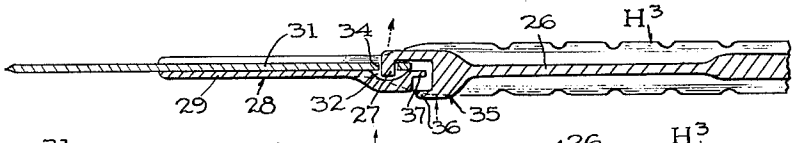


FIG. 10.

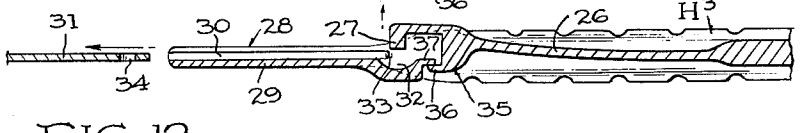


FIG. 11.

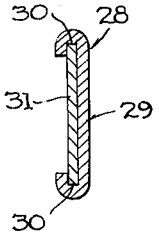


FIG. 12.

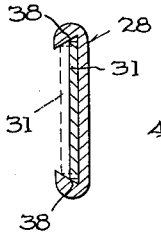
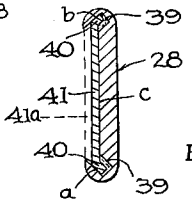


FIG. 13.



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3,262,205

SCALPEL

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Filed Jan. 21, 1964, Ser. No. 339,198
1 Claim. (Cl. 30—338)

This invention relates generally to scalpels, and more particularly, to handles for holding replaceable scalpel blades.

For many years, the most commonly used type of surgical scalpel has comprised a handle having an elevated boss at one end thereof, about which is forced the scalpel blade which is provided with an elongated keyed slot adapted to fit under and over the boss. In applying the conventional surgical blade to such a handle, close attention is required in order to manipulate the blade slot around the mounting recess on the handle and thereafter it is necessary to flex the blade so as to force it onto the handle in a manner to provide a snap fit. When mounted on the handle, the blade is slightly offset to one side of the central longitudinal axis of the handle and the blade is permanently disposed under flexure in order to securely retain the blade to the end of the handle. Not only is the offset nature of the cutting edge of the blade objectionable to the surgeon, but it is quite difficult even for those fully experienced in this field to install and remove such a blade from the scalpel handle. The effort required to remove and apply these blades is so great and the danger of one's cutting themself while doing so is so prevelant, that surgeons rarely, if ever, perform this operation themselves, but instead have one of their assistants or a surgical nurse carry out this operation.

Many efforts have been made in the past to provide scalpels having much more readily removable blade attaching means. However, these designs have met with many objections, the primary one of which has been the problem of maintaining the instruments in a sterile condition, since these devices have included numerous moving parts closely associated with one another which presented difficulty in cleaning and maintaining sterility.

Accordingly, one of the primary objects of the present invention, is to provide a scalpel blade handle having means for effortlessly locking the scalpel blade in position for use.

Another object of this invention is to provide a scalpel blade handle adapted to utilize the conventional type of blade presently being universally used, which may be attached to the handle without any flexure of the blade and is secured thereto with its cutting edge coincident with the center longitudinal axis of the handle.

A further object of this invention is to provide a scalpel blade handle having a finger releasable spring latch bar for positively securing a scalpel blade thereto.

Still another object of this invention is to provide a scalpel blade handle having finger releasable latching means for retaining a scalpel blade thereto and comprising a one-piece integral unit.

A still further object of this invention is to provide a one-piece scalpel blade handle having releasable means for positively securing scalpel blades of different thicknesses thereto.

With these and other objects in view, which will more readliy appear as the nature of the invention is better understood, the invention consists in the novel construction, combination, and arrangement of parts, hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawing in which:

FIGURE 1 is a side elevation of a known form of scalpel blade handle and includes the conventional scalpel blade used therewith.

FIGURE 2 is a bottom plan view of the handle shown in FIGURE 1, with a conventional blade attached thereto and illustrating the offset relationship between the cutting edge of the blade and the longitudinal center axis of the handle.

FIGURE 3 is a side elevation of a scalpel blade handle according to the present invention.

FIGURE 4 is a partial and enlarged longitudinal sectional view of the scalpel handle of FIGURE 3, slightly enlarged and showing the alternate position of the spring latch bar.

FIGURE 5 is a partial perspective view of the scalpel blade handle shown in FIGURES 3 and 4, with a conventional scalpel blade shown in an exploded position.

FIGURE 6 is a partial side elevation of a modification of a scalpel blade handle according to the present invention.

FIGURE 7 is a longitudinal sectional view of the scalpel blade handle shown in FIGURE 6, slightly enlarged and illustrating the alternate position of the spring latch bar.

FIGURE 8 is a side elevation of a modification of the scalpel blade handle according to the present invention, and illustrating a different form of scalpel blade as used therewith.

FIGURE 9 is a partial longitudinal sectional view, slightly enlarged, of the scalpel blade handle illustrated in FIGURE 8 and shows the scalpel blade in its assembled position.

FIGURE 10 is a longitudinal partial sectional view of the structure illustrated in FIGURE 9 with the spring latch bar in its alternate or releasing position, and the scalpel blade shown removed from the scalpel blade handle.

FIGURE 11 is a transverse sectional view along the line 11—11 of FIGURE 8.

FIGURE 12 is a modification of the blade attaching portion of the handle shown in FIGURE 11.

FIGURE 13 is a further modification of the blade attaching portion of the handle shown in FIGURE 11.

FIGURES 1 and 2 will be seen to disclose the conventional scalpel handle and blade as most commonly used throughout the world at the present time. This scalpel includes a handle generally designated H having at one end thereof a blade support portion generally designated 1, for receiving the blade B. The elongated blade support 1 includes an elevated boss 2 which is separated from the remainder of the support portion by a peripheral recess 3.

As will most clearly be seen in FIGURE 2, the peripheral recess 3 is slightly offset to one side of the center longitudinal axis of the handle H. Likewise, the base 4 of the support portion, immediately adjacent the shank of the handle H is also offset to one side of the center longitudinal axis. The blade B shown removed from the handle in FIGURE 1 is provided with the usual elongated aperture for providing for attachment to the handle H of FIGURES 1 and 2. The overall length of the aperture, generally designated A, is approximately equal to the length of the boss 2 and includes a major section 5 closest to the tang 6 of the blade, the width of which section is slightly larger than the width of the elongated boss 2 on the blade support portion. Immediately forward of the major section 5 are minor, or reduced width sections 7 and 8 forming the remaining portions of the aperture 4, the purpose of which will be described immediately hereinafter.

In order to attach the blade B to a handle H it is necessary to first dispose the blade in overlying relationship to the support portion 1 so that the extreme end of the boss 2 is guided into the opening of the major sec-

tion 5 of the blade. It is necessary then to manipulate the blade so that the two shoulder edges 9 which form the reduction between the major section 5 and minor section 7 will be guided into the end of the recess 3 forming the separation between the elongated boss 2 and the base 4 of the support 1.

It will be seen that since the width of the boss 2 and the underlying base 4 of the blade support are of similar dimension that it requires a bit of manual dexterity in order to prevent the entire blade support 1 from being inserted too far through the major section 5 of the blade. After once arranging the blade so that the shoulder edges 9 are properly guided into the end of the recess 3, then it is necessary to force the blade rearwardly toward the handle H to guide the sides of the minor section 7 of the blade as well as, ultimately, the sides of the minor section 8, all the way rearwardly into the recess 3.

Referring now to FIGURE 2, it will be observed that as the foregoing is undertaken, the tang 6 as well as the entire rearmost portion of the blade B is flexed by the top of the boss 2, to one side away from the longitudinal center axis of the handle. This rearward pressure is continued until the rearmost edge of the major section 5 snaps downwardly over the rear edge of the elongated boss 2, at which time the blade and handle are ready for use and will appear as in FIGURE 2. Since it is not uncommon for the thickness of the conventional blades now used to exceed even .015 inch in thickness, it will be readily appreciated that a considerable amount of flexing is present in the structure as shown in FIGURE 2. In fact, it is this very inherent flexure which is relied upon to securely anchor such a blade to known handles. To remove this type of blade from the handle, it is necessary to elevate with one finger, the tang 6 of the blade, an amount sufficient to lift the rearmost edge of the major section 5 above the rearmost edge of the elevated boss 2, while at the same time, pulling the blade away from the handle until the sides of the minor sections are removed from the recess 3. It is both during this removal process, as well as the initial mounting of a blade upon a handle of this type that numerous persons have accidentally cut their fingers.

FIGURES 3, 4 and 5 relate to one embodiment of the improved scalpel blade handle forming a part of the present invention. In this form, as well as other embodiments disclosed hereinafter, it will be seen that means have been provided on a scalpel blade handle to permit ready application and removal of the conventional type of scalpel blade which is shown in FIGURE 1, without any danger of the operator accidentally injuring themself, and even more important, it will be seen that when installed upon the handle of the present invention, that the blade is disposed with its longitudinal axis coincident with the longitudinal center axis of the handle so that the cutting edge of the blade is disposed at its most ideal angle with respect to the handle thereby obviating any guess work on the part of the surgeon when using such a device. The handle H' shown in FIGURES 3–5 is provided with a blade support portion 1' including a base 10 having thereon an elongated boss 11 elevated from the blade support portion by means of a peripheral reccess 12.

As will be seen most clearly in FIGURE 4, the upper surface of the base 10 of the blade support 1' is flat and disposed substantially coincident with the center longitudinal axis of the handle H'. In the present invention, the elevated and elongated boss 11 is both narrower and shorter in dimensions than the underlying base 10 of the blade support. It will be understood that the width of the boss 11 remains slightly smaller than the width of the major section 5 of the blade. An important distinction is that the overall length of the boss 11 is slightly less than the length of the major section 5 so that in mounting the blade upon the blade support 1' it is only necessary to drop the blade straight down over the boss 11,

whereupon this movement will be halted when the surrounding portion of the blade rests upon the juxtaposed area of the base 10 which is substantially wider than the boss 11.

A spring latch bar 13 is attached at one end by any suitable fastening means such as a screw 14 to the medial portion of the shank of the handle H'. The opposite free end 15 of the spring latch bar overlies the rearmost portion of the blade support 1' and is provided on its opposed undersurface with a hook catch 16 normally having its end disposed within a recess 17 in the upper surface of the blade support 1'. The rearwardly facing locking edge 18 of the hook catch 17 is disposed from the end of the shank of the handle a distance approximate to the corresponding distance between the rearmost edge of the major section 5 of the blade and the tang 6 thereof, as will be most clearly seen in FIGURE 4.

In order to securely lock a blade to this handle after the major section 5 has been dropped over the boss 11, one merely slides the blade rearwardly in a straight line direction until the tang 6 of the blade is disposed beneath the hook catch 16 on the free end of the latch bar. When the blade is moved rearwardly after dropping the major section 5 over the boss 11, it will be seen that the side edges of the narrower minor sections 7 and 8 are guided into the recess 12 between the boss 11 and base 10 and the rearward movement will be halted when the forwardmost end wall of minor section 8 is seated within the opposed portion of the recess 12 on the end of the blade support. At the end of the rearward movement of the blade the spring urged hook catch 16 will be entrapped into the rearmost edge of the major section 5 to securely retain the blade to the handle.

A finger release projection 19 is formed on the undersurface of the spring latch bar 13 and extends through an opening 20 in the underside of the blade shank. By applying upward pressure to the end of the finger release 19, it will be seen that it is a simple matter to elevate the spring latch bar to the dotted line position shown in FIGURE 4 in order to completely remove the locking edge 18 from the blade for the ready removal or insertion of a new blade. It will follow that the removal of a blade is but a reversal of the steps above described to attach a blade. That is, when the finger release projection is pressed inwardly towards the handle, the hook catch 16 on the spring latch bar 13 will be elevated out of the major section 5 of the blade. Thereafter the blade is merely pulled straight forwardly until the tang 6 of the blade clears the hook catch 16 and the rear edge of the major section 5 is adjacent the rear edge of the boss 11, whereupon the blade is then lifted straight outwardly transversely to the blade support 1'.

The embodiment illustrated in FIGURES 6 and 7 may be preferred by some users, since its construction lends itself to easier maintenance of sterility. It is believed that this advantage will be readily apparent upon a review of the drawing, wherein it will be seen that there are fewer separate parts and cleaner lines to the construction, thereby obviating some of the crevices and confined areas present in the previously described embodiment. The construction of this latter embodiment is basically similar to that of the previously described form in that a spring latch bar is utilized having a hook catch at one end thereof adapted to engage the rearmost edge of the major section of the scalpel blade to secure it to the blade support. However, in this form, the spring latch bar 21 is secured at its fixed end by means of brazing or welding in order to remove the possibility of latent contamination which may be present whenever a removable fastener such as the screw 14 in the previous embodiment is used. The medial portion of the shank of the handle H^2 is completely removed to provide an elongated central opening 22. The advantage of this form of construction will be readily apparent from FIGURE 7, wherein

it will be seen that there is no shank portion underlying the spring latch bar **21**, or surrounding the finger release projection **23**. Likewise, instead of a single detent type recess for the hook catch **24** of the spring latch bar, there is provided an elongated channel type recess **25** for the hook catch, which recess extends rearwardly all the way to the opening **22**. By the above construction, it will be seen that there is now provided a scalpel blade handle construction wherein there are no close fitting elements which could possibly harbor foreign matter such as blood or tissue, which would make it difficult to sterilize the article prior to use.

In the embodiment illustrated in FIGURES 8–11, a handle H^3 is disclosed which is adapted to be used in combination with a blade of different construction than that shown in connection with the previously described embodiments. In this form, a spring latch bar **26** is shown which is similar to that previously described with respect to FIGURES 6 and 7, except that a preferred method of manufacture has been employed wherein the material for the free end portion of the spring latch bar containing the hook catch **27** is formed by a swaging operation so that a handle H^3 is formed which is of one piece or integral construction since the metal forming the free end portion of the spring latch bar was drawn out or swaged from the metal contained in the initial blank from which the handle was produced. The blade support of this handle, generally designated **28**, includes a flat mounting base **29** having its upper surface substantially coincident with the center longitudinal axis of the handle H^3 and includes a pair of opposed side channels **30, 30** forming opposed blade receiving recess as most clearly shown in FIGURES 10 and 11. The width of the recesses forming the channels **30** is slightly greater than the thickness of the tang **31** of the blade in order to provide a sliding fit as the blade is inserted into the blade support **28**. Positive means for limiting the rearward movement of the tang **31** of the blade during insertion between the channels **30, 30**, may be provided by forming end walls **33** to said recesses at a position which will halt insertion of the blade at a point whereby the opening **34** in the end of the tang **31** of the blade will be positioned immediately beneath the hook catch **27** of the spring latch bar **26**.

A recess **32** is formed in the base of the blade support **28** immediately beneath the hook catch **27**. Preferably, this recess is deep enough so that when a blade is removed from the scalpel handle, the free end of the hook catch **27** will not contact the bottom of this recess. In this manner, it will be seen that there are no two portions of the present scalpel blade handle which are in contact with one another when a blade is removed from the handle so that it is impossible for any crevice to be formed between which may be retained blood, tissue, or other contaminating articles which would hinder the sterilization of the scalpel handle.

During the swaging operation forming the free end of the spring latch bar **26**, in addition to the hook catch **27**, a finger release projection **35** is formed on the underside thereof, as shown in FIGURES 9 and 10. A flange **36** formed on the forward edge of the finger release projection **35** abuts a rearwardly disposed stop shoulder **37** formed at the rear of the blade support **28**. As will be seen in FIGURE 10, the flange and stop shoulder cooperate to provide a limit when the finger release projection is depressed for releasing the blade.

The transverse sectional view of the blade support **28** shown in FIGURE 11 discloses that the recesses forming the channels **30, 30** are rectangular in cross section, thereby corresponding to the side edges of the tang **31** of the blade which are of similar cross section.

FIGURE 12 on the other hand illustrates a modification of the cross section of the blade support **28**, wherein the channel recesses comprise inclined side walls **38, 38**, thereby forming a V-shaped recess at either side of the

blade support **28**. The purpose of such construction is to provide for the mounting of blades having different thicknesses within the same scalpel blade handle. Shown in full sectional lines in this figure is a tang **31** of a blade which may be for example of the same thickness and same width as the blade as shown in FIGURE 11. If, on the other hand, it is desired to utilize a blade of substantially greater thickness than this blade, the same blade support **28** is adapted to receive and retain a much thicker blade as shown in the dotted sectional lines **31**. It will thus be apparent that as a thicker blade is used, it is only necessary to provide a more narrower tang **31** on the blade as the thickness increases.

FIGURE 13 is a transverse sectional view of still another modification of the blade support **28**, which may be used in connection with the handle H^3. In this embodiment, a pair of offset recesses **39, 39** are formed in the opposite side channels of the blade support **28** for the reception of correspondingly offset side flanges **40, 40** obliquely formed on the opposite edges of the tang **41** of a specially constructed blade.

As with the embodiment shown in FIGURE 12, the blade support **28** is constructed to provide for the mounting of blades having different thicknesses. The offset recesses **39, 39** are of a width greater than the thickness of the blade flanges **40, 40** for the reception of alternate blade flanges thicker than those shown in full sectional lines in FIGURE 13. It will thus be seen that as long as a constant relationship is maintained between the position of the outermost flange surfaces *a, b* and the center undersurface *c*, that various thickness blades may be inserted in this support as indicated by the thicker blade **41***a* represented by dotted lines.

It will be understood that regardless of the cross sectional arrangement of the blade support **28** as used in combination with the scalpel blade handle H^3, the same type of spring latch bar **26** may be used. Likewise, the one-piece integral handle and latch bar arrangement shown specifically in connection with the embodiment illustrated in FIGURES 8–10 may also be utilized in connection with the other embodiments disclosed respectively, in FIGURES 3–5 and FIGURES 6–7.

I claim:

A scalpel comprising, a handle having a shank provided with a blade support at one end adapted to retain a blade provided with an elongated aperture by attachment thereto without deflection of the blade, said support including a base portion having an upper flat surface substantially parallel with the longitudinal axis of said handle and of substantially less width than said blade, an elongated boss on said base portion engageable within said blade aperture, said boss of a width less than said base portion and a length less than said aperture and having a peripheral recess adjacent said base portion, a pivotal latch bar fixedly attached at one end to the shank of said handle and having its free end disposed in overlying relationship to said base portion, the free end of said latch bar normally biased towards engagement with said base portion and arcuately displaceable therefrom, a finger release on the underside of said latch bar and projecting outwardly from the shank of said handle, and catch means on the underside of the free end of said latch bar juxtaposed said upper surface intermediate said elongated boss and shank, said catch means including a rearwardly facing locking edge adapted to engage the rearmost edge of said blade aperture to retain said scalpel blade when placed upon the upper surface of said base portion and oriented by said boss, whereby the forward portion of said aperture will be disposed within the forward portion of said recess to prevent rearward displacement of said blade while said catch means on said fixedly attached latch bar engaging the rear portion of said aperture prevents forward displacement of said blade.

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