

April 26, 1966

T. R. ARDEN

3,247,592

BLADE HANDLE

Filed Feb. 5, 1964

FIG. 1.

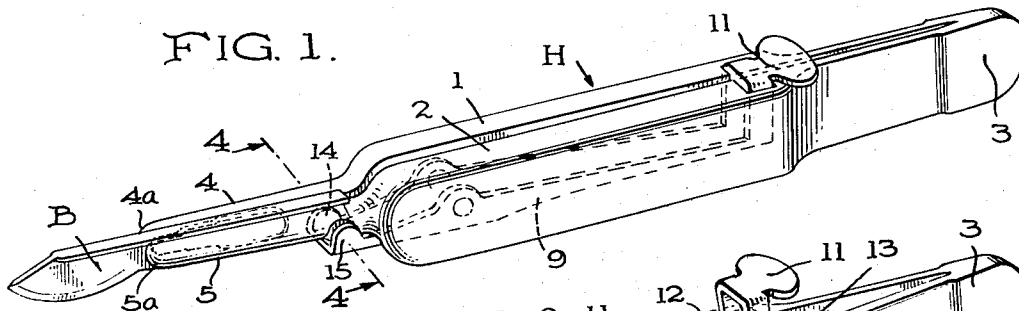


FIG. 2.

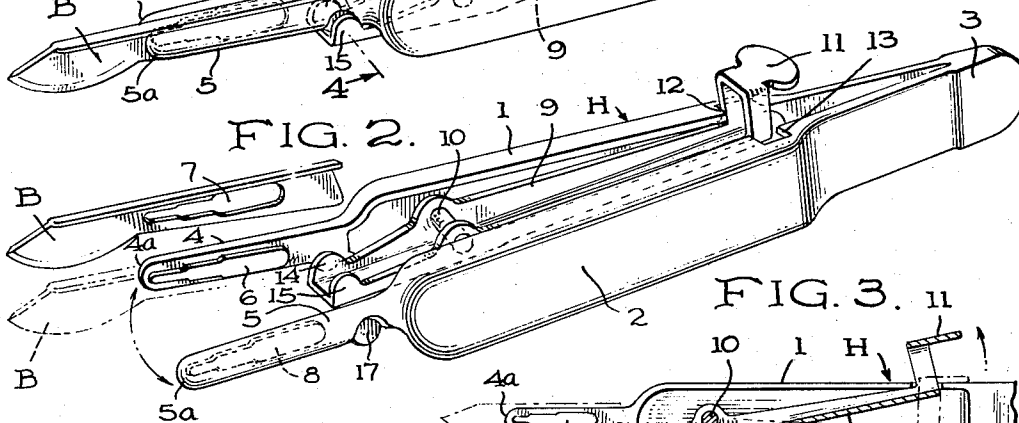


FIG. 3.

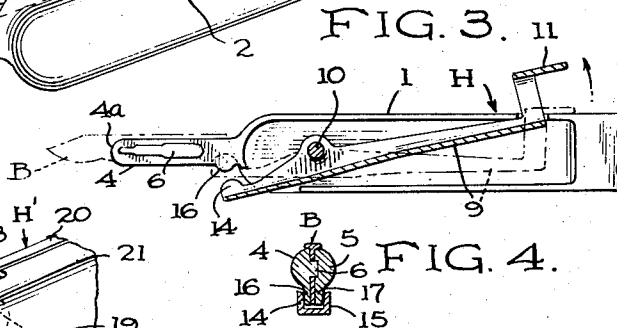


FIG. 5.

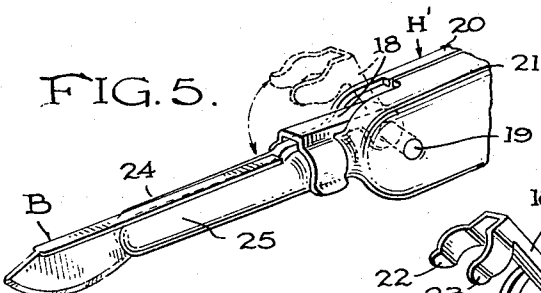


FIG. 4.

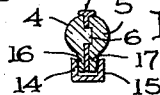


FIG. 6.

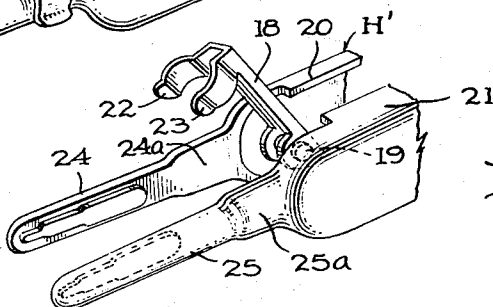


FIG. 7.

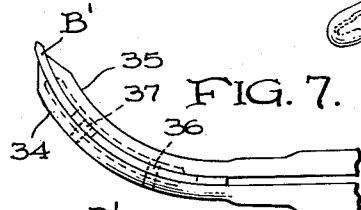


FIG. 8.

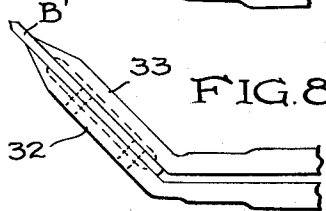


FIG. 9.

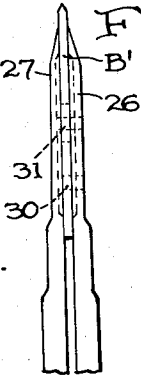
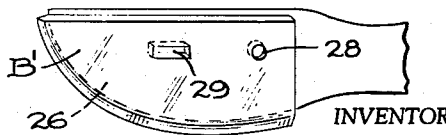


FIG. 10.



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3,247,592

BLADE HANDLE

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9 Claims. (Cl. 30-338)

This invention relates generally to handles for blades and, more particularly, to a handle including means permitting quick attachment or removal of the cutting blade therefrom.

Many efforts have been made in the past to provide blade handles having readily removable blade attaching means. However, these designs have met with many objections, the primary one of which has been the inclusion of a multiplicity of moving parts for orienting, clamping, and securing the blade to the handle. In addition, most of the prior art blade handles were constructed with a view toward use with a specially constructed blade usually produced by the same manufacturer as the handle.

There is a large demand for blade handles having quickly removable blades thereon, for use in several industries wherein the operator must at all times have before him a cutting edge of the utmost sharpness. Beside the industrial requirements for a suitable blade handle, numerous hobbyists, such as modelmakers have need for an efficient handle for removably attaching blades.

Beside the conventional and well known single or double edge safety razor blade, perhaps the most readily available commercial cutting blade, on the market is the common surgical scalpel blade which is available throughout the world. It is well known that many types of handles have been provided for utilizing the common razor blade in an industrial cutting application. However, the cutting edge of the razor blade which is straight was designed solely for the purpose of cutting whiskers, and this type of blade, when put to any other type of use, will be found to be lacking in utility. The common surgical blade, however, is produced in a variety of sizes having cutting edges of numerous curvatures and is produced with a cutting edge that will far outlast any other readily available cutting blade.

Accordingly, one of the primary objects of the present invention is to provide a handle for a cutting blade comprising a pair of caliper-type jaws for removably securing the cutting blade.

Another object of the present invention is to provide a handle for a cutting blade including releasable locking means for securing the blade thereto.

A further object of this invention is to provide a handle for removably securing a cutting blade thereto wherein the cutting blade is extremely thin and when secured to the handle is disposed in a transversely arcuate position.

Still another object of the present invention is to provide a blade handle including a pair of resilient caliper jaws having blade supports at one end with blade orienting means thereon.

With these and other objects in view, which will more readily 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 perspective view of a blade handle according to the present invention.

FIGURE 2 is a perspective view of the blade handle of FIGURE 1 and illustrates the locking means in its released position with the caliper jaws spread apart to receive or replace the blade.

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FIGURE 3 is a partial side elevation of the blade handle shown in FIGURES 1 and 2 and illustrates, partly in section, the locking lever in its release position.

FIGURE 4 is a transverse sectional view taken along the line 4-4 of FIGURE 1 and illustrates the lock clamping means holding the blade supports in their clamped position.

FIGURE 5 is a partial perspective view of another embodiment of a blade handle according to the present invention and illustrates, in broken lines, the alternate or unlocking position of the clamping means.

FIGURE 6 is a partial perspective view of the structure shown in FIGURE 5 with the caliper jaws in their open or unlocked position and shows the blade orienting means on the opposed faces of the blade supports.

FIGURES 7-9 are partial top plan views of modified blade supports particularly adapted to engage ultra-thin cutting blades.

FIGURE 10 is a partial perspective view of the cutting blade and one of the blade supports shown in FIGURE 9.

Similar reference characters designate corresponding parts throughout the several views of the drawing.

Referring now to the drawings, particularly FIGURES 1 and 2, the blade handle will be seen to comprise a body H which may be molded, stamped, or cast from any suitable material possessing at least a minimum degree of inherent resiliency. The blade handle H is generally symmetrical and comprises a pair of caliper jaw portions 1, 2 which are permanently attached at the tail end thereof, as at 3, by any suitable means such as by welding. The opposite free ends of the caliper jaws 1 and 2 are of reduced cross section and are formed to provide a pair of clamping blade supports 4 and 5, respectively. The caliper jaws 1 and 2 are initially connected at the tail portion 3 so that when the jaws are in their normal "at rest," or open position, they will be spread apart a substantial distance, as shown in FIGURE 2.

The inner face of one of the blade supports 4 is provided with an elongated boss 6 the peripheral outline of which corresponds to the shape of the elongated opening 7 as formed in the conventional scalpel blade B. The opposed inner face of the blade support 5 is provided on the other hand with an elongated recess 8 which is of a mating configuration with respect to the directly opposed boss 6, as can be seen in the sectional view of FIGURE 4. The boss 6 projects outwardly from the inner face of the blade support 4 a distance which is somewhat greater than the thickness of the blade B so that when a blade is engaged between the supports 4 and 5, the boss 6 will extend into the recess 8 in the opposite support 5. It will be apparent that the boss should not become seated in the bottom of the recess before the inner faces of the two supports have securely clamped the opposite sides of the blade.

With the jaws 1 and 2 in their spaced apart open position as shown in FIGURE 2, a blade may be quickly oriented between the two supports of the handle merely by positioning the opening 7 of the blade over the correspondingly shaped or mating boss 6. Thereafter, with the blade engaged by the boss, pressure is applied against the resistance inherent in the spaced-apart jaws 1 and 2 to close the same in order to clamp the blade B between the inner faces of the blade supports 4 and 5. In order to securely retain the blade supports 4 and 5 in the closed or locked position of FIGURE 1, releasable locking means are provided.

A releasable locking lever 9 disposed between the two jaws is pivotally supported on the pin 10 fixed to the inner surface of the caliper jaw 1. The rearmost end

of the locking lever 9 is provided with actuating means in the form of a finger release 11 which projects upwardly from between the caliper jaws 1 and 2 through a pair of opposed cut-out portions 12 and 13 therein. Bifurcated clamping means comprising a pair of rigid upstanding ears 14 and 15 is formed on the forwardmost end of the locking lever 9 opposite the end provided with the finger release and is disposed immediately beneath the rearmost section of the clamping blade supports 4 and 5. Adapted to be engaged in clamping relationship by the ears 14 and 15 are a pair of locking tabs 16 and 17 projecting downwardly from the rear of the blade supports 4 and 5.

When a blade B is attached to the blade handle it is first oriented by placing the opening 7 around the elongated boss 6. It will be understood that upon the closing of the caliper jaws 1 and 2, the free ends 4a and 5a of the blade supports 4 and 5, respectively, will contact the opposite sides of the blade B first. In other words, the intermediate portions of the caliper jaws 1 and 2 will be slightly bowed outwardly with respect to each other when the free ends of the two jaws are initially pressed together. Subsequent finger pressure will then draw the two jaws closer together so that the entire lengths of the inner faces of the two clamping blade supports 4 and 5 will be in abutting or engaging relationship with the opposite sides of the blade B. At this point, the finger release 11 which heretofore was in the elevated or extended position as shown in FIGURE 2, is pressed downwardly toward the caliper jaws which causes the locking lever 9 to pivot about the pin 10 to elevate the clamping ears 14 and 15 from the position of FIGURE 2 to the locking position of FIGURE 1 wherein it will be seen that the two ears 14 and 15 engage the locking tabs 16 and 17 of the blade supports to securely lock the same together on opposite sides of the blade B.

Since the normal position of the caliper jaws is as shown in FIGURE 2 wherein they are spread apart from one another, it will follow that when the two jaws are joined together by manual pressure to the locked position shown in FIGURE 1 that the natural tendency of the resilient jaws 1 and 2 will be urging the two jaws apart against the action of the clamping ears 14 and 15 on the forward portion of the locking lever 9. It is this natural biasing action of the caliper jaws which maintains them in the locked position between the ears 14 and 15.

In order to unlock the blade handle to remove a blade B therefrom, it is only necessary to elevate the finger release 11 which causes the locking ears 14 and 15 to be displaced from their clamping position upon the locking tabs 16 and 17, whereupon the two caliper jaws 1 and 2 will spring apart due to their inherent resiliency and then, the blade B may be readily removed from around the elongated boss 6.

As it will be most clearly seen from FIGURE 3, the pivot pin 10 is mounted in the forward portion of one of the caliper jaws 1 or 2 so that the distance between the pivot point and the clamping ears 14 and 15 is substantially less than the distance between the pin 10 and the finger release 11. In this manner, it will be apparent that a mechanical advantage is achieved in that although elevation of the finger release 11 to its limit position as shown in FIGURE 3 only depresses the locking ears 14 and 15 downwardly a short distance, nevertheless a decided mechanical advantage is achieved in the force obtained during depression of the finger release projection in order to force the locking ears 14 and 15 into snug engagement about the locking tabs 16 and 17. It will follow that the clearance between the locking tabs and the ears should be one offering a very tight frictional fit in order to securely clamp the blade supports 4 and 5 upon both sides of the blade B.

The embodiment illustrated in FIGURES 5 and 6 discloses a handle H' provided with a modified form of a locking lever 18 which is pivoted at one end to a pin 19 secured to either one of the caliper-type jaws 20 or 21.

The opposite or free end of the locking lever 18 projects upwardly from between the two jaws and is provided with a pair of spaced apart spring clamping arms 22 and 23 extending downwardly toward the clamping blade supports 24 and 25. The rearmost portion of each of the blade supports 24 and 25 is of substantially semicircular section so that when a blade B is clamped between the two supports, a somewhat circular configuration is formed for receiving the spring clamping arms 22 and 23 which are snapped downwardly over the two semicircular sections of the blade supports to securely retain them in clamping engagement with the blade B. Quite obviously, the clamping arms 22 and 23 must be inherently resilient and the normal distance between the spaced-apart ends of these arms should be less than the diametrical dimension afforded by the two semicircular sections 24a and 25a so that when the locking lever 18 is in the locked position shown in full lines in FIGURE 5 the blade supports 24 and 25 will be tightly secured against opposite sides of the blade B by the force exerted by the clamping arms 22 and 23. In order to unlock this form of the blade handle, it is only necessary to apply an upward lift to one of the lower free ends of either of the clamping arms 22 and 23 in order to elevate the lever to the dotted line position of FIGURE 5 whereupon the natural resiliency of the caliper arms 20 and 21 will cause them to spring apart to the open position as shown in FIGURE 6 for ready removal of the blade from between the blade supports.

The blade handles disclosed in connection with the previously described embodiments are intended primarily for use in conjunction with the conventional surgical scalpel blade B. These blades are usually produced from relatively thick stock, that is, in the order of .015" in thickness so that very little lateral support is required to prevent undue transverse flexing of the blade when being used. In the case of a surgical blade handle, this is necessary since the surgeon wishes to have before him a cutting blade having a cutting edge which projects forwardly unencumbered by any lateral supporting means which may hamper his ability to get into tight quarters for necessary incisions. In the present instance, however, wherein the blade handle and its cutting blade are provided for industrial purposes primarily, the foregoing limitation is not applicable. Thus, the modelmaker or hobbyist may prefer to use a blade having a finer cutting edge and of much thinner stock, for example on the order of .003" or thereabouts. In order to utilize such a blade in a handle according to the present invention, it is necessary to provide additional lateral support for the body of the blade.

FIGURES 7-10 of the drawings disclose modified clamping blade supports for use in combination with extremely thin cutting blades. FIGURE 10 illustrates a blade B' as used in the embodiments contained in FIGURES 7-10. It will be understood that the various shapes of blade supports as disclosed in FIGURES 7-10 may be used in combination with either one of the types of locking levers illustrated in the previously described embodiments, that is to say, the rearmost portions of these blade supports may be provided with either locking tabs 16 and 17 for use with a locking lever 9, or with semicircular sections 24a and 25a for use with a locking lever 18.

In order to properly support the thin type of blade, it is necessary to provide blade supports 26 and 27 which are of sufficient dimension in order to overlie substantially all of the body of the blade B', except for the cutting edge thereof, as will be seen in FIGURE 10. As shown, this blade is provided with a registry opening 28, as well as an alignment slot 29. The inner surface of one of the blade supports 27 is provided with a pair of projecting elements comprising a circular anchor peg 30 and a retaining pin 31. When mounting such a blade to the handle with the caliper jaws in their spaced-apart open position, the blade is oriented between the supports by engaging the registry opening 28 of the blade over the

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anchor peg 30. At the same time, the retaining pin 31 will be inserted into the alignment slot 29 of the blade. Thereafter, the caliper jaws of the handle are compressed together as in the previously described embodiments to clamp the blade B' between the supports 26 and 27, and the structure will then appear as in FIGURE 9.

FIGURES 7 and 8 illustrate modifications of the foregoing wherein a blade handle is provided having blade supports disposed at an angle offset to the central longitudinal axis of the handle. In the form shown in FIGURE 8, the two blade supports 32 and 33 are straight but are disposed at an offset or oblique angle. The manner of orienting and clamping the blade B' between the supports 32 and 33 is similar to that described with respect to the embodiment illustrated in FIGURES 9 and 10.

Often it is desired to have a cutting edge which is of arcuate configuration such as shown in the embodiment of FIGURE 7. In this form, the same blade B' is utilized by providing a pair of similarly curved blade supports 34 and 35. The anchor peg 36 and retaining pin 37 are attached to the blade support 35 having the smaller radius for reasons which will be readily understood immediately hereinafter. In attaching the blade B' to this form of handle, the registering opening 28 of the blade is first slipped over the anchor peg 36 and then the two jaws of the handle are closed to bring the blade supports 34 and 35 into clamping engagement upon opposite sides of the blade. As the curvilinear blade supports deflect the blade, the retaining pin 37 will initially enter the rear-most portion of the alignment slot 29 but as the blade is further deflected to its final arcuate contour, the retaining pin will slide forwardly with respect to the slot 29 to the final clamping position shown in FIGURE 7.

I claim:

1. A handle for removably supporting a blade having an opening, comprising, a pair of caliper jaws secured together at their tail ends, mating blade supports provided on the opposite free ends of said jaws, locking surfaces at the rear of said supports, said jaws inherently resilient to urge said supports in a laterally spaced apart relationship, means projecting from the inner surface of one of said supports and engaging with a mating fit said blade opening to orient a blade between said supports, locking means including a lever pivotally attached between said jaws and having a free end projecting therefrom, the free end of said lever provided with a pair of oppositely disposed clamping arms, whereby, a blade positioned by said engaging means will be rigidly secured between said supports as said lever is pivoted to engage said clamping arms about said locking surfaces adjacent the rear of the blade disposed therebetween.

2. A handle for removably supporting a blade according to claim 1, wherein, said locking lever is pivotally

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attached to the inner surface of one of said caliper jaws at the end of said lever opposite said clamping arms.

3. A handle for removably supporting a blade according to claim 1, wherein, said lever is pivotally attached along its medial portion and includes actuating means on its end opposite said clamping arms, said actuating means projecting upwardly from between said jaws and said clamping means extending downwardly from between said jaws adjacent said blade supports.

4. A handle for removably supporting a blade according to claim 2, wherein, said locking lever projects upwardly from between said jaws adjacent the top of said blade supports.

5. A handle for removably supporting a blade according to claim 1, wherein, said clamping arms comprise a pair of rigid spaced apart ears and said locking surfaces at the rear of said supports comprise planar tabs.

6. A handle for removably supporting a blade according to claim 1, wherein, said clamping arms comprise a pair of curved spaced apart spring arms and said locking surfaces at the rear of said supports are of semi-circular configuration to provide a snap-type locking action.

7. A handle for removably supporting a blade according to claim 1, wherein, said orienting means comprises, an elongated boss on one of said supports, and a mating recess in the other of said supports to preclude angular displacement of said blade.

8. A handle for removably supporting a blade according to claim 1, wherein, said blade supports between which the blade is positioned are disposed at an angle oblique to the longitudinal axis of said jaws from a point immediately adjacent said locking surfaces.

9. A handle for removably supporting a blade according to claim 1, wherein, said blade supports between which the blade is positioned are curvilinear from a point immediately adjacent said locking surfaces, and the blade when retained therebetween is deflected to conform to the contour of said curvilinear supports.

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