

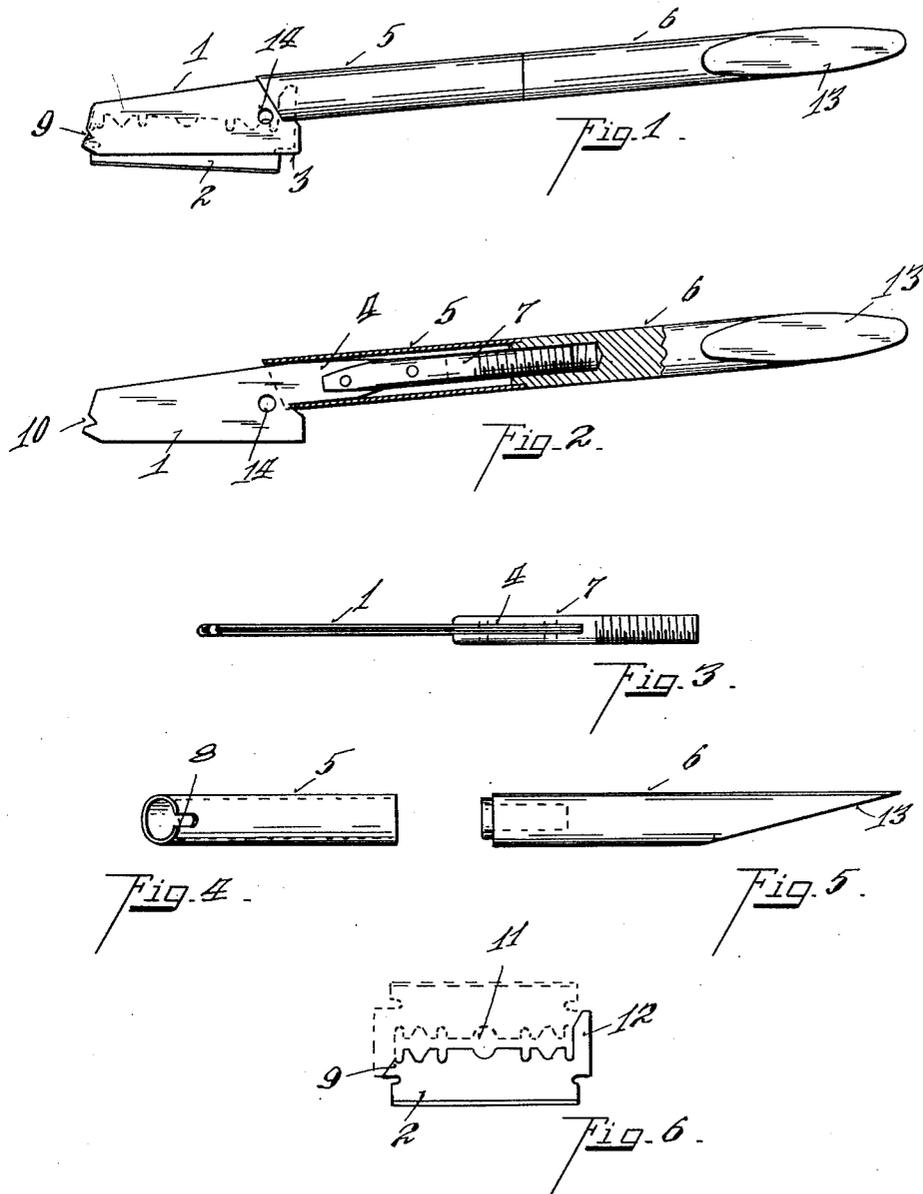
May 12, 1953

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2,637,904

KNIFE HAVING A REPLACEABLE BLADE

Filed July 24, 1951



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UNITED STATES PATENT OFFICE

2,637,904

KNIFE HAVING A REPLACEABLE BLADE

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Application July 24, 1951, Serial No. 238,277

1 Claim. (Cl. 30-334)

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This invention relates to a knife or scalpel particularly for use in surgery and may be used for numerous other purposes.

An object of the invention is to provide a knife for surgical service in which a thin flat metal blade is readily insertable and removable from a holder, the blade preferably constituting a half-section of a double edged conventional type of thin flat metal razor blade, thereby converting such type of commercial razor blade into a pair of corresponding or duplicate blades of reduced width dimension each for confinement within a minimum width of blade holder element within which the blade is clamped and to avoid exposure or extension of the blade beyond the rear edge of the holder. The commercial double edged razor blade when appropriately segmented to provide a pair of duplicate single edged blades of reduced width, produces one as a forward end of a form for making an anchoring connection with a clasp which embraces the blade and a laterally extended opposite or rear end for making a binding engagement therewith to securely clamp the blade within the clasp and permit the rear end of the blade to extend a greater degree from the clasp to longitudinally angle or incline the cutting edge of the blade from the relative edge of the clasp from which the blade extends.

Another object is to provide a surgical knife with a thin flat metal blade possessing a keen cutting edge and adapting the use of a half-section of a conventional double cutting edged razor blade, readily applicable within and removable from a holder of simple and durable structure adapted to embracingly hold and firmly clamp the blade therein for blade discard and substitution after each remedial operation as a sanitary factor and to eliminate or require the user to sharpen or hone the blade.

Various other features and advantages of the invention are more fully set forth and apparent from the following description of a preferred embodiment as illustrated by the drawings accompanied herewith and forming a part of this specification, in which:

Figure 1 is a side elevation of the improved knife with the blade in an active position therein.

Figure 2 is a central longitudinal section of the handle with the blade holding clamp therein, in side elevation and the blade omitted.

Figure 3 is a top plan view of the blade holding clamp.

Figure 4 is a plan view of the clamp sleeve as an element of the handle.

Figure 5 is a side elevation of the handle.

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Figure 6 is a plan view of the blade, as a half section of a double cutting edge conventional razor blade, corresponding to a duplicate half section shown in dotted line, and which together constitute a full dimension razor blade.

Referring to the drawings, the blade holding clasp, which is indicated generally at 1, preferably is formed of a single thin metal strip which is bent upon itself intermediate its length to provide a pair of corresponding parallel limbs or leaves. The leaves are slightly spaced laterally for the reception therebetween of a thin blade indicated at 2. The fold at the forward or head end of the clasp is angled slightly in a rearward direction from the lower to the upper edge of the clasp. The cutting edge of the blade extends or protrudes from the lower edge 3 of the clasp as indicated in Figure 1.

The upper edges of the leaves are inclined longitudinally from front to rear such that the rearward end of the clasp is substantially wider than the forward end. The rearward end of each leaf includes an integral stem 4 substantially narrower than the rearward end of the leaf, thus providing a shoulder as viewed in Figure 2. At the juncture of the shoulder and stem, a notch is formed to provide a socket engagement with the forward end of a binder sleeve 5. The binder sleeve is interposed between the shoulder and the handle 6 to provide a clamping engagement with the leaves and the blade as later explained in detail.

The stems 4 of the clasp are socketed within a bifurcated end of a shank rod 7, which is longitudinally extensive of the clasp and in permanent connection therewith. The free end of the shank rod 7 is screw-threaded for concentrically connecting the same with the handle 6.

The shank rod 7 telescopically extends through the binder sleeve 5 to compressively engage the forward end of the sleeve with the rear end of the blade and for binding the parts together by the threaded connection of the handle upon the shank of the clasp and securely clamping the blade to and within the clasp.

The forward end of the sleeve 5 at its lower side is slotted providing a kerf 8 for an intermeshing engagement with the notch in the rear end of each of the leaves of the clasp and abuttingly bear against the rear end of the blade which the notch in each of the leaves of the clasp exposes.

The forward end of the blade in the manner in which a conventional double cutting edge razor blade is subdivided into a pair of corresponding half-sections, provides a lip 9 at one end of the

blade for engagement into a notch 10 in the fold forming the forward end of the clasp, thereby anchoring the forward end of the blade to the clasp to hold the same against lateral displacement.

The conventional double cutting edge leaf type of razor blade produced by different manufacturers correspond in outline configuration and dimension and vary slightly in outline design of the central and longitudinal aperture through the body portion of the blade, which however is immaterial in dividing the blade into duplicate sections, each for separate and independent use and installation in the present holder.

For surgical service it is desirable that the blade be of reduced width dimension and that only a single cutting edge be exposed, either in a straight or angled line and that the handle be in an off-set and angular position from the cutting edge of the blade for better facility and increased hand hold clearance.

The standard double edged razor blade provides an extremely keen cutting edge requiring no sharpening or honing by the user, economical, justifying its discard after use, as a sanitary factor.

The blade is embraced by the clasp as an external support with straight edges at opposite sides of an adjacent the cutting edge of the blade and forward end of the blade is anchored in a manner which permits the blade to be set with its cutting edge in a straight or angled line.

The outline of the conventional doubled edged razor blade is recessed at each of its four corners, each extending in rectangular lines, one longitudinally and the other transversely of the blade, so that the body portion of the blade at its opposite longitudinal ends extends beyond the relative cutting edges whereby the projecting ends of the body portion of the blade are representative of tangs, of which one respectively is maintained for one end of each of the half sections in subdividing the original blade unit.

In half sectioning the original blade unit it is angularly slit at two of the recessed corners at relative opposite ends and sides from the longitudinal edge of the recess to the central aperture 11, thereby subdividing the original blade into a pair of duplicate reduced dimension blades, each at one end having a lip 9 and at its opposite end a tang 12 in plane with and extending laterally from the blade.

The tang 12 when the blade is inserted between the limbs or leaves of the clasp traverses the slot or kerf in the forward end of the clamp sleeve 5 for a bearing contact with the base of the slot to compressively bind the blade within the clasp. Briefly, therefore, the forward end of the blade is fulcrumed within the clasp by engagement of its forward pointed lip 9 within the notch 10 at the forward fold of the clasp. This allows the rearward end of the blade, which includes the tang 12, to be raised or lowered with respect to the lower edge 3 of the clasp, angulating the blade with respect to the clasp.

The blade is locked in its angular position by screwing the handle forwardly upon the screw threaded stud 7. This forces sleeve 5 forwardly, causing its kerf 8 to embrace the opposite rear edges of the leaves to draw them together against opposite sides of the blade. At the same time, the inner end of the kerf engages the tang 12 and thus binds the blade in its angular adjustment.

The blade is thus frictionally locked in adjusted

position by endwise pressure upon the tang, forwardly through the blade to the lip 9 at the forward end. It will be observed, therefore, that the kerf clamps the blade between the leaves by forcing the rearward ends of the leaves toward each other to prevent buckling of the relatively thin blade under the endwise pressure exerted upon it.

The handle 6 at its rear end is formed to provide an inclined plane surface 13 as a facility for a surgical knife, although it is recognized the sleeve 5 may be of increased length to constitute the handle, while the handle 6 may be of reduced dimension as a stud, primarily serving as a nut to compressively bind the parts together.

The leaves of the blade holding clasp, toward the rear end thereof and midway of its width, are each provided with an aperture 14 which are in registry to expose a portion of the tang 12 for its accessibility and permit a pointed tool to be engaged through the opening to move the blade downwardly to facilitate its removal from the holder. In surgical use of the knife the blade is apt to become bound between the leaves of the clasp, as by the drying of blood and serum collected thereon, interfering with its removal.

Having described my invention, I claim:

A combined knife holder and replaceable blade comprising a clasp adapted to confine the replaceable blade, said clasp constituting a relatively thin strip of metal having a substantial width, said strip being folded upon itself intermediate its length to provide a fold in its forward end and a pair of parallel leaves, said leaves each having a stem of reduced width extending from the rearward end thereof, a threaded rod having an end fastened to both of said stems, a handle threaded upon the rearward end of said rod, a sleeve interposed between the handle and rearward end of said leaves, a kerf formed in the forward end of said sleeve adapted to embrace the rearward end portions of said leaves to force the same toward one another, a thin flexible knife blade interposed between said parallel leaves, said knife blade having an angular lip projecting outwardly from the forward end thereof, said blade having a tang extending upwardly from the rearward end thereof, the fold at the forward end of said leaves having a notch formed therein adapted to receive the angular lip of the blade and thereby provide a fulcrum point adapting the body of the blade to be raised or lowered with respect to the leaves in the plane of the leaves, the tang at the rearward end of the blade being adapted to be engaged by the rearward end of the kerf of the sleeve and frictionally held therein when said handle is tightened to lock the blade in angular position by endwise pressure applied against the lip and tang, whereby the flexible blade is maintained in straight condition counter to said endwise pressure by said spaced leaves.

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References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
1,044,303	Unsinger	Nov. 12, 1912
1,484,657	Larzelere	Feb. 26, 1924
1,874,740	Green	Aug. 30, 1932
2,234,532	Nelson	Mar. 11, 1941
2,491,575	Nelson	Dec. 20, 1949