Nov. 17, 1953 H. L. BAKER 2,659,143

STENCIL CUTTING KNIFE

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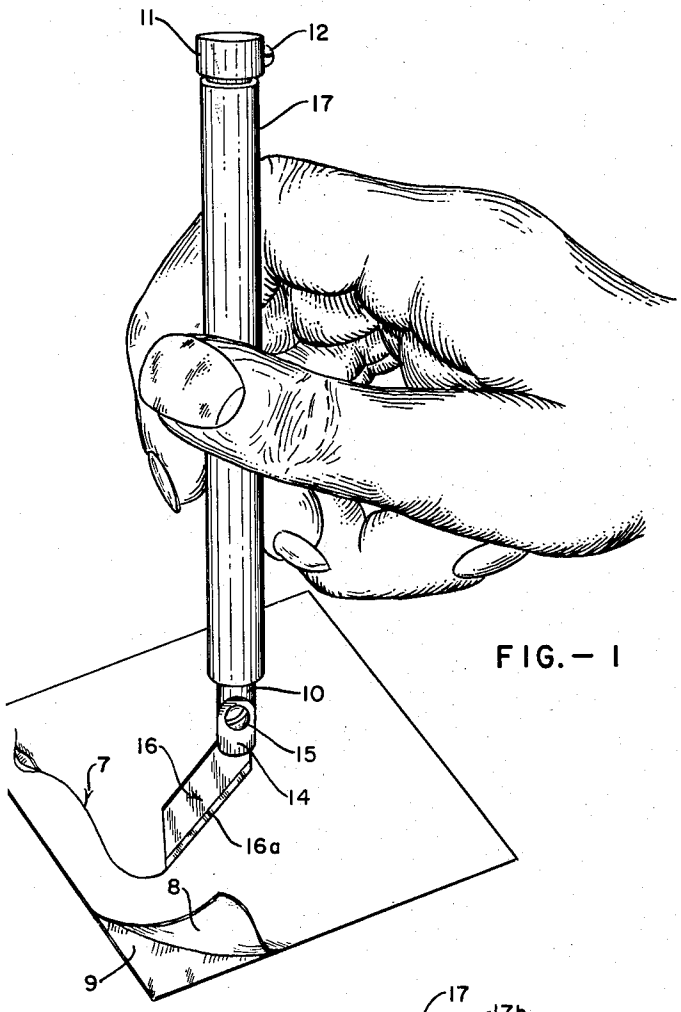


FIG. — 1

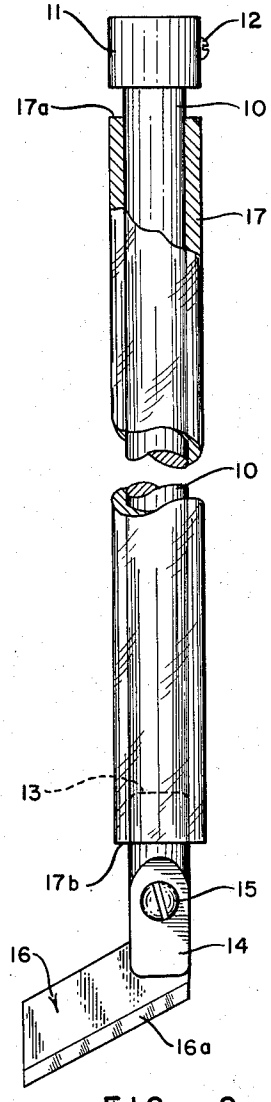


FIG. — 2

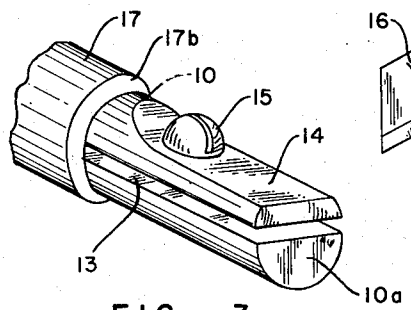


FIG. — 3

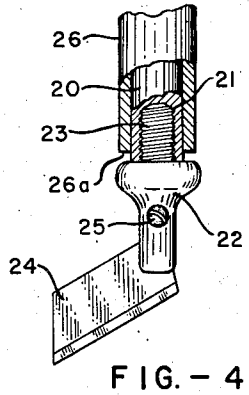


FIG. — 4

INVENTOR.

Harvey L. Baker

BY

W. A. M. Burgess

ATTORNEY

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STENCIL CUTTING KNIFE

Harvey L. Baker, Denver, Colo.

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7 Claims. (Cl. 30—317)

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My present invention relates to a stencil cutting knife. It has to do particularly, although not exclusively, with an improved knife for use in silk screen stencil cutting.

One of the objects of my present invention is to provide an improved stencil cutting knife capable of cutting the stencil properly without the application of any pressure to the knife blade by the operator.

Another object of the present invention is to provide an improved stencil cutting knife in which the knife blade is detachably connected to the knife.

A further object of the present invention is to provide an improved stencil cutting knife in which the knife blade is carried by a portion of the knife which is freely rotatable and also capable of limited axial movement relative to the handle portion of the knife.

Another object of the present invention is to provide an improved stencil cutting knife having a weighted portion for automatically applying the proper amount of pressure to the knife blade for stencil cutting purposes while the knife handle portion is being held by the hand of the artist or operator.

A further and important object of the present invention is to provide an improved stencil cutting knife of the foregoing character which is of relatively simple construction, inexpensive to manufacture, and one which is capable of use particularly for silk screen stencil cutting, requiring no pressure by the artist, and one which will not cut into the film base.

The foregoing and other objects and advantages of the present invention will appear from the following description and appended claims when considered in connection with the accompanying drawing forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In said drawing:

Fig. 1 is a perspective view of one form of stencil cutting knife embodying the present invention and illustrating one manner of using the knife.

Fig. 2 is an elevational view, partly broken away and partly in section, on an enlarged scale, and revealing certain of the details of the knife shown in Fig. 1.

Fig. 3 is an enlarged fragmentary detail perspective view of the blade-carrying portion of the knife of the preceding views; and

Fig. 4 is a fragmentary detail view, partly broken away and partly in section, of the blade-

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carrying end portion of a somewhat modified form of stencil cutting knife embodying the present invention.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing, since the invention is capable of other embodiments and of being practiced or carried out in various ways. It is to be understood also that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

While the improved stencil cutting knife of the present invention has many uses, it has been designed particularly for use in silk screen stencil cutting. One of the main advantages of the knife of my present invention is that it will not cut too deeply because of the fact that the only pressure applied to the knife blade is caused by the inherent weight of the blade-supporting member or shaft of the knife assembly. Thus, there is no need to maintain a tension on the knife blade as is true of all previously known stencil cutting knives.

With my invention, the handle portion of the knife is grasped by the operator and held loosely while the blade is cutting the work, without the application of any pressure being exerted by the operator upon the knife blade. In use, the operator or artist holds the knife in substantially the same manner as he would hold a pencil, although the elongated body of the knife will be held in a plane which is a little closer to the vertical or perpendicular than that in which a pencil is normally held in use. The artist grips the outer sleeve-like portion or handle of the knife in the manner illustrated in Fig. 1 of the drawing and allows the knife blade-carrying member or center shaft to turn freely in the handle portion while following the marked or desired line or pattern of cut. The knife blade of the knife of my invention will cut through the top layer of lacquer but will not cut into the underlying film base. By virtue of the present invention, many plates are saved which would otherwise be ruined by cuts which were too deep as are frequently made when using previously known stencil cutting knives.

With particular reference to Figs. 1, 2, and 3 of the drawing, there is shown in these figures one form of improved stencil cutting knife embodying my invention. The knife, as best seen

in Figs. 1 and 2, comprises a stem or blade-carrying shank 10, which is preferably formed from metal round bar or rod stock. The upper end of the stem 10 carries a removable band or cap 11 which, as shown, is held in place upon the stem by a screw or the like 12. The lower end of the stem or shank 10 is provided with a slot or cut-out portion 13 (see particularly Fig. 3) which is of sufficient width to receive and removably support a knife blade 16. The slot or notch 13 extends inwardly from the outer or lower end of shank 10 for a distance of from three-quarters of an inch to one inch in length so as to provide bifurcated portions between which the blade may be clamped. One leg of the bifurcated end is reduced in thickness as seen at 14, so as to provide a smaller cross section at the lower end portion of the shank, as clearly seen in Fig. 3. The legs 10*a* and 14 of the bifurcated end portion are preferably drawn together to clamp the knife blade 16 securely between them, by means of a screw or bolt 15. The blade is capable of being adjusted to any desired angularity. If desired, sufficient metal may be removed at 14 so as to permit the head of the tightening screw 15 to enter the tubular or sleeve-like handle or enclosure 17, although, as shown, the head of screw 15 projects outwardly beyond the major diameter of stem 10 and thus acts as a stop for the sleeve-like handle 17 when it is moved downward toward the knife blade 16.

The stem or shank 10 is weighted and, as stated above, is preferably formed from a length of round steel rod stock. The tubular or sleeve-like handle 17 may be formed from any suitable and preferably light weight material, such as plastic. The inner diameter of handle 17 is preferably only slightly larger than the diameter of the stem or shank 10, thus permitting free rotation or oscillation of the stem or shank within the sleeve or handle. Moreover, the shank or stem 10 is free to move lengthwise or axially within the handle 17, its downward movement relative to the handle being limited by the band or cap member 11 coming into contact with the upper end 17*a* of handle 17. The upward longitudinal movement of stem 10 is limited by the engagement of the head of screw 15 with the lower end 17*b* of handle 17.

If desired, the upper end of stem 10 may be externally threaded and the ring or cap member 11 may be internally threaded to cooperate with the threaded stem, permitting the removable or releasable mounting of the stop member 11 upon the stem 10.

In assembling the form of stencil cutting knife illustrated in Figs. 1, 2, and 3, the stop member 11 may be applied to the stem 10 and secured in place upon it by the screw 12. The sleeve-like handle 17 may then be slipped over the opposite end of the stem 10, whereupon the clamping screw 15 is applied to the lower or reduced end portion 14 of the stem. Thereafter, the blade 16 which has an extremely sharp cutting edge 16*a*, is inserted into slot 13. The screw 15 is then tightened down to draw the reduced portion or leg 14 toward the other leg 10*a* to securely clamp the blade 16 in place. The knife is now ready for use. It will be understood that when it is desirable to remove and replace blade 16, it is merely necessary to loosen screw 15 to release the blade.

One manner of using the stencil cutting knife of my invention is illustrated in Fig. 1. In this figure there is shown a film base 9 to which is applied an outer layer or film of lacquer 8. In the art of silk screen stencil cutting, it is highly important that the cut be made only through the thickness of the lacquer film without cutting into the film base. With all previously known stencil cutters, wherein the handle and the blade are rigidly connected together, it has required great skill on the part of the artist to control and apply only the proper amount of pressure or tension to cause the knife blade to penetrate only the lacquer film or top coat, without damaging the underlying film base. In other words, the proper amount of pressure required to effect the cutting operation had to be controlled by the artist himself. If an artist, therefore, did not have, so to speak, the proper "touch," the film base was cut and the stencil thereby rendered unfit for use.

In using the stencil cutting knife of my invention, the artist holds the free handle 17 in his hand as shown, whereupon the weight of the freely movable stem or shank 10 applies the proper amount of pressure to knife blade 16 to effect the proper cut through only the lacquer film 8, this cut being indicated by the irregular line 7 in Fig. 1. It is to be understood that the weight of the hand of the artist is taken by the supporting surface, leaving the knife free of this weight, there being only the weight of stem 10 to apply the necessary cutting pressure of the knife 16 to the lacquer film. Thus, the artist's hand is left free to manipulate the cutting knife to follow the outline or pattern marked on the work. By virtue of the present improved knife, a novice can easily prepare a stencil without any damage to the film base.

As depicted in Fig. 1, in use the upper end of handle 17 is spaced slightly downward from the stop member 11, with the lower end portion of the handle being disposed only slightly above the clamping screw 15.

In Fig. 4 there is shown a somewhat modified form of the present invention. In this form, the lower end of the stem or shank 20 is provided with a socket 21 which is internally threaded to receive the threaded stem portion 23 of a knife blade-attaching and supporting member 22. In this form, knife blades, such as blade 24, come equipped with knife blade-supporting members, such as the knife blade supporting member 22, 23. In this form, blade 24 is mounted in the lower end of member 22 by a screw 25. To replace a blade and blade holder, it is simply necessary to unscrew member 22 from socket 21 and then insert a new combination knife blade and knife-blade holder unit. In this form of my invention, a freely rotatable and longitudinally or axially movable sleeve-like handle member 26 is also provided so that the stem 20 is free to rotate and also to move up and down within handle 26, as in the preceding form of the invention. The enlarged upper body portion of member 22 serves as a limiting stop for handle 26 when the lower end 26*a* of the handle moves down into contact with it. In Fig. 4, the lower end of the handle is shown spaced from the body portion of member 22 and is in virtually the same position as handle 17 shown in Fig. 1.

It is to be understood that I have illustrated merely several ways in which the shank or stem 10 or 20 may be weighted, only one manner of applying stop means to the upper end of the stem, and only two different ways in which knife blades and knife blade-supporting units may be applied to and removed from the improved stencil cutting knife assembly of my invention.

Various other means for accomplishing those ends may be employed within the scope of my invention.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A stencil cutting knife comprising a sleeve-like handle adapted to be held lightly in the hand of an operator, a weighted stem extending through said sleeve-like handle, said stem having freedom of both rotary and longitudinal movements in and relative to said handle, and a stencil cutting blade carried by the lower end of said weighted stem.

2. Structure according to claim 1, wherein the weighted stem has stop means at its upper end to limit the downward longitudinal movement of said stem within and relative to said sleeve-like handle.

3. Structure according to claim 1, wherein the stencil cutting knife is removably and interchangeably attached to the lower end of said weighted stem.

4. A stencil cutting knife comprising a hollow handle, a knife blade-carrying member of greater weight than said hollow handle extending through the handle and having freedom of both longitudinal and rotatable movement within and relative to said hollow handle and projecting beyond both ends thereof, and a knife blade attached to one end of said knife blade-carrying member.

5. A stencil cutting knife according to claim 4, wherein stop means is provided on the upper end of the knife blade-carrying member to limit the downward movement of said member relative to the hollow handle, and wherein a socket is

formed in the lower end portion of the knife blade-carrying member to receive and removably support said knife blade.

6. In a stencil cutting knife, a sleeve forming the handle portion of said knife to be held in the hand of the operator, a weighted stem portion within the sleeve, said stem portion being longer than said sleeve and also being free to rotate and reciprocate therein, a blade carried by the lower end of said stem, and a cap on the upper portion of the stem which together with the inherent weight of said stem portion applies sufficient pressure to the knife blade to cause the same to cut into a stencil.

7. A stencil cutting knife comprising a sleeve-like tubular handle adapted to be held lightly in the hand of an operator, a weighted stem of round cross section extending through said tubular handle, said stem having freedom of both rotary and longitudinal movements in and relative to the handle, said stem having a bifurcated lower end providing a slot to receive a stencil cutting blade, a blade disposed in the slot, and means for clampingly and adjustably holding said blade in said slot.

HARVEY L. BAKER.

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