April 16, 1935. A. F. HUETTNER 1,998,428

SAFETY MICROTOME KNIFE HOLDER

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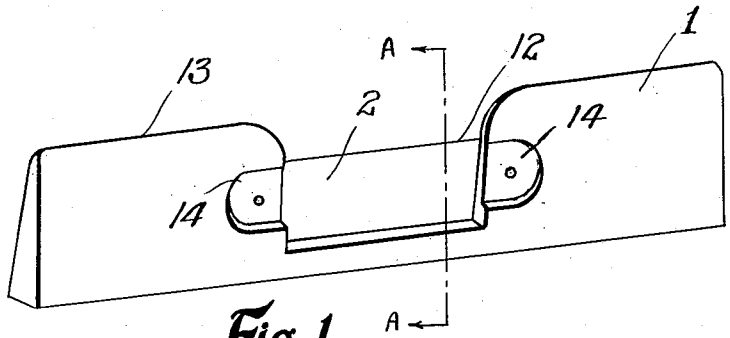


Fig. 1.

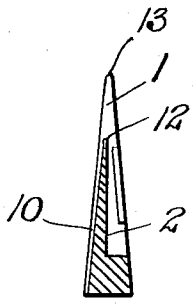


Fig. 5.

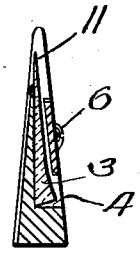


Fig. 3.

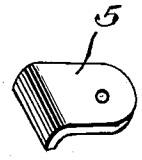


Fig. 4.

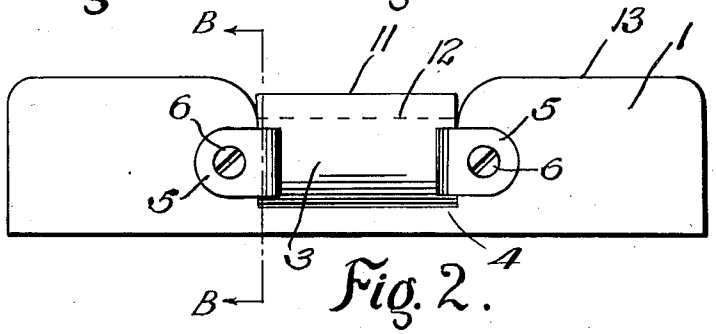


Fig. 2.

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SAFETY MICROTOME KNIFE HOLDER

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13 Claims. (Cl. 88—40)

This invention relates to microtomes of the type in which a specimen is reciprocated past a stationary knife to cut off successively thin microscopic sections of the specimen. More particularly this invention relates to means of mounting the knife which is used in a microtome of the character described.

The cutting of sections requires an extremely sharp edged blade or knife. For this purpose the type of microtome knife employed has resembled a very heavy razor of triangular cross section (frequently with concave opposite surfaces) and a cutting edge comprising the full length of the blade. This blade is secured in a support which is mounted in such a fashion on the base of the microtome so that it may slide at the will of the operator.

However, the blade, being of a very large size and having a sharp edge along the entire length, a great amount of time is wasted by scientists in the care required in mounting the blade in the support. This care is necessary to prevent cutting the fingers of the operator and in order not to dent or dull the fine edge of the blade through an accidental dropping or scraping on the body of the microtome. Furthermore, should the operator desire to make any adjustments of the section that is being cut, he has to make sure that his fingers are not cut by the blade, the ends and edge of which extend beyond the actual portion cleared by the reciprocating section holder. Furthermore, a large blade must be employed which makes its manufacture very costly.

The object of this invention is to provide means whereby all these aforementioned difficulties are eliminated. While the cost of the blades is very much less owing to the fact that small standard reenforced, plane, concave or bi-concave razor blades, of the kind used in a number of safety razors (not of the wafer type) can be used, while all danger of breakage is eliminated.

Having this object in mind, the present invention comprises details of construction and operation, as shown in the following specifications and in the annexed drawing, in which

Fig. 1 is a perspective view of my improved blade holder.

Fig. 2 is a front elevational view of my improved blade holder with the blade in clamped position.

Fig. 3 is a section taken on line A—A of Fig. 1.

Fig. 4 is a perspective view of one of the clamping members.

Fig. 5 is a section taken on line B—B of Fig. 2.

Referring now in detail to the drawing, 1 designates a microtome blade holder to which there is clamped in the manner hereinafter appearing, a microtome blade 3, the holder and blade being adapted to be mounted on a microtome machine in any suitable manner. The holder 1 comprises an elongated, substantially flat bar made of metal, wood, fibre or any other suitable material and preferably of generally triangular cross-section having a narrow bottom surface or base 15, a front surface 16 and a rear surface 17. The surfaces 16 and 17, as shown in the drawing, diverge to form an acute angle with one another whereby the bar is substantially flat. The holder 1 is formed in the central portion of the front surface 16 thereof with a rectangular recess or depression 2 forming an edge 12 parallel to but located below the upper aligned edges 13 of the holder 1. The depression 2 forms a shoulder or ledge 4 parallel to the edge 12 and located above the bottom surface 15 or base of the holder. The surface 17 of the holder 1 is formed with a wide groove 10, preferably opposite to and having the width of the recess 2, whereby the upper edge 12 is spaced from the surface 17 and is located between the surfaces 16 and 17 of the holder.

The knife blade 3 may have a concave outer surface and is located within the recess 2, the base thereof contacting the ledge 4 and the cutting edge 11 thereof preferably being located below the edges 13 of the holder 1 and above the edge 12 formed by the recess 2 and the groove 10. The cutting edge 11 is likewise, as shown in Fig. 1, spaced from the surface 17 of the holder and located between the surfaces 16 and 17 of said holder. The surface 16 of the holder is formed with a pair of recesses 14 on the opposite sides of the recess 2 for receiving clamping members 5, the latter having portions overlapping the recess 2 and engaging the blade 3. Screws 6 or the like fastening members serve to attach the clamping members to the holder whereby the blade may be firmly clamped to said holder.

It will now be understood that the blade being located in the center of the holder, the holder may be grasped on opposite sides of the blade for adjustment without danger of injury to the fingers of the operator. Furthermore, the cutting edge 11 being located below the edges 13 of the holder and between the surfaces 16 and 17 of the holder, said holder may be placed on a table in various positions without the edge contacting the table, hence protecting the cutting edge. Fur-

thermore, to sharpen the blade it is merely necessary to release the clamping members 5.

The cutting edge 11, it will be noted, clears the upper edge 12 of the holder but nevertheless does not extend beyond the surface 17 of said holder whereby the cutting of the specimen may be effectively carried out and the cutting edge of the blade nevertheless protected.

I wish it to be understood that my invention is not limited in its scope to the particular constructional form heretofore described and illustrated in the accompanying drawing. Various modifications can be made without departing from the spirit of the invention as pointed out in the following claims.

I claim:

1. In combination, a microtome blade holder comprising an elongated bar of triangular shape having an intermediate depression in the outer edge thereof, a blade mounted in said depression and having an edge parallel to and located adjacent to and inwardly of said outer edge.

2. A microtome blade holder comprising an elongated bar having an elongated edge and being formed with a depression dividing said edge into two portions, the depression forming an edge parallel to and disposed below the first edges, and a blade received within said depression and having a cutting edge disposed between said portions of said elongated edge, and the edge formed by said depression.

3. In combination, a microtome blade holder comprising a bar having an edge on one side thereof and formed with a cut away portion providing an edge parallel to and adjacent said first edge, and a blade within said depression having a cutting edge disposed parallel to and between said edges.

4. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, said surfaces being formed with opposite recesses forming an edge disposed below said first edge, and a blade received within the recess of one of said surfaces and having an edge disposed between said first two edges.

5. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, said surfaces being formed with opposite recesses, and a blade received within the recess of one of said surfaces, the cutting edge of said blade being disposed between the planes of said surfaces.

6. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, said surfaces being formed with opposite recesses, and a blade received within the recess of one of said surfaces, the cutting edge of said blade being disposed between the planes of said surfaces, and below said edge of said holder.

7. In combination, a microtome blade holder comprising an elongated bar, one edge of said bar being depressed to form an edge set back from the first edge, and a microtome blade clamped to said bar and having a cutting edge disposed between said edges.

8. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, said edge being depressed in an intermediate portion thereof forming a second edge parallel to and disposed below the first edge, and a blade clamped to said holder and having a cutting edge disposed between and parallel to said edges.

9. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, an intermediate portion of said edge being depressed to form an edge disposed below and parallel to said first edge, said second edge being located between the planes of said diverging surfaces, and a microtome blade attached to said holder having a cutting edge disposed between said edges, said cutting edge likewise being located between the planes of said diverging surfaces.

10. In combination, a microtome blade holder comprising a bar of substantially triangular cross-section and provided with diverging surfaces forming an acute angle and meeting in an edge, an intermediate portion of said edge being depressed to form an edge disposed below and parallel to said first edge, said second edge being located between the planes of said diverging surfaces, and a microtome blade attached to said holder having a cutting edge disposed between said edges, said cutting edge likewise being located between the planes of said diverging surfaces, and clearing said second edge.

11. In combination, a microtome blade holder comprising a bar having a pair of diverging surfaces forming an acute angle and meeting in an edge, one of said surfaces being formed with a rectangular recess forming an edge disposed adjacent and below said first edge, a microtome blade received within said recess and having a cutting edge disposed between said edges.

12. In combination, a microtome blade holder comprising a bar having a pair of diverging surfaces forming an acute angle and meeting in an edge, one of said surfaces being formed with a rectangular recess forming an edge disposed adjacent and below said first edge, a microtome blade received within said recess and having a cutting edge disposed between said edges, and means for clamping said blade to said holder.

13. In combination, a microtome blade holder comprising a substantially flat, elongated bar provided with depressions on opposite faces thereof forming an edge set back from one edge of said bar, and a ledge on one face of the bar and disposed adjacent the other edge of said bar, and a microtome blade received within the depression on one surface of said holder and having the base thereof contacting said ledge, and the cutting edge thereof disposed between said set back edge and the first edge of said bar.

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