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KNIFE HOLDER CLAMP FOR MICROTOME

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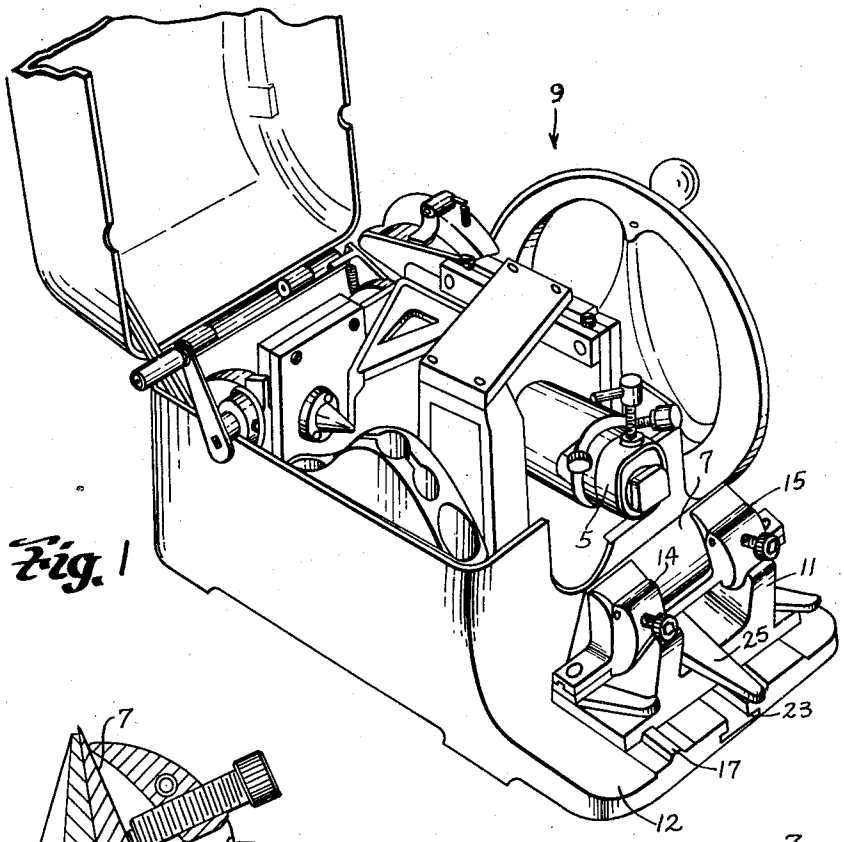


Fig. 1

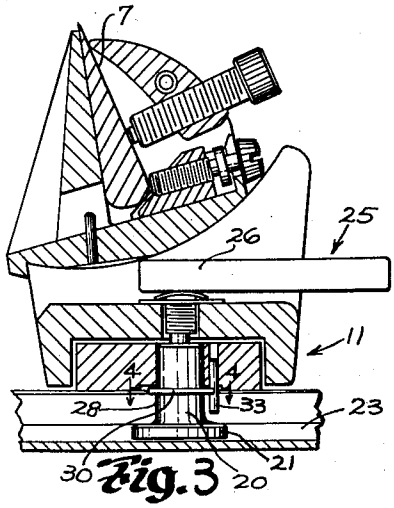


Fig. 3

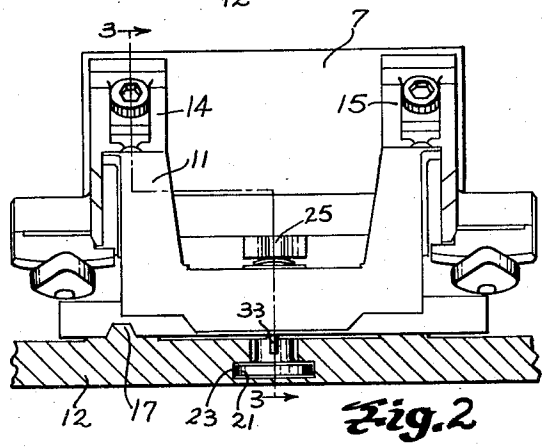


Fig. 2

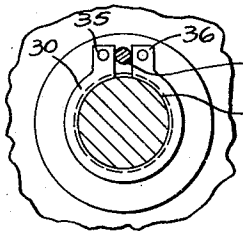


Fig. 4

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KNIFE HOLDER CLAMP FOR MICROTOME

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2 Claims. (Cl. 88—40)

This invention relates to improved means for locking the knife holder of a microtome in adjusted position. This knife holder is supported and guided by the microtome base so that the holder may be adjusted toward and from the position in which the specimen on the object clamp is sliced into sections. Due to the proximity to the base and to the space taken up by the clamps on the holder for clamping the knife, devices for locking the knife holder in adjusted position on the base have to be manipulated within a small compass.

For instance, in one locking device previously used the head of the locking device was engaged in a groove in the base, and was drawn up tight by rotating an eccentric which engaged the locking device. This had the advantage that less than half a turn of the eccentric can apply or release the locking device, an essential provision in such cramped quarters; but it has the disadvantage that such wear as occurs during use tends to render the lock insecure. Furthermore, it may occasionally occur that manufacturing tolerances accumulate instead of cancelling each other, so that upon assembly the eccentric is ineffectual. Because of these disadvantages a somewhat modified form of device has been used in which a series of openings was provided in the locking device, and if looseness occurs with one opening, the eccentric can be transferred to another so as to attain the necessary tightness. This has proved to be a somewhat cumbersome arrangement, and the shifting of the eccentric from one opening to another sometimes requires more skill than is available at the place of use of the microtome.

The present invention is as simple in principle as a bolt and nut, and yet the locking of the knife holder in adjusted position may be ensured by resetting the bolt if wear occurs so as to introduce looseness.

In the drawings which illustrate my invention:

Fig. 1 is a perspective view (with the hinged case open) of a microtome to which improved locking means have been applied in accordance with my invention;

Fig. 2 is an end view of the knife holder of the microtome, the base being shown in section to better illustrate my improved locking means;

Fig. 3 is a section on the line 3—3 of Fig. 2 showing the locking means in elevation, and

Fig. 4 is a detail sectional view on line 4—4 in Fig. 3.

The specimen to be sliced is mounted in the object clamp 5. The mounted specimen is reciprocated up and down relative to the microtome knife 7 by mechanism indicated in general by the numeral 9. As such mechanism is old and well known, it is not necessary to describe its details.

The knife holder 11 slides on the microtome base 12 toward and from the object clamp 5 so as to assume various adjusted positions. The knife 7 itself is positioned in the holder 11 by spaced knife clamps 14 and 15. A rib 17 on the base serves as a guide along which the holder 11 may be adjusted toward and from the clamp 5. My improved locking means serves to lock the holder 11 in position when the proper adjustment has been effected.

My locking means includes a bolt 20 having a head 21. As the holder 11 which carries the bolt 20 is moved along the guide 17, the head 21 travels in an undercut groove 23 in the base 12. With this arrangement, the holder 11 can be bolted to the base 12 in any adjusted position, provided a device in the nature of a nut threaded on the bolt can be turned down tight to draw the head 21 into locking engagement with the top of the undercut groove 23. Such a device is provided in accordance with my invention in the form of a lever 25 having one of its ends 26 threaded on the bolt 20. As is apparent, there is but little space for swinging the outer end of lever 25, and tightening of the bolt must be accomplished by turning the lever 25 through a relatively small arc, which means that the bolt must be nearly tight before lever 25 is swung. This essential feature is provided by accommodating the bolt 20 in a recess 28 which is not a binding fit on the bolt, allowing the latter to turn relative to the holder 11. Accordingly, it is necessary to frictionally hold the bolt 20 so that it does not rotate with the lever 25 when the latter is turned to tighten the bolt. The necessary friction for this purpose is afforded by a split spring ring 30 engaged in a slight groove 31 in the shank of the bolt 20. A pin 33 fixed in the holder 11 engages between the ends 35 and 36 of the spring ring 30.

In operation, the lever 25 is swung to release the clamping action of the bolt 20 so that the holder's position may be adjusted relative to the object clamp 5, and then lever 25 is swung back to clamp the holder 11 to the base 12. During the normal operation of clamping and unclamping, the spring ring 30 prevents the bolt 20 from turning as the lever 25 turns. If the lever 25 hits the holder 11 before it sufficiently clamps or releases, adjustment of the position of the bolt 20 is needed; and this is accomplished by withdrawing the holder 11 to expose the head 21. At this time the bolt 20 may be turned (overcoming the friction of spring ring 30) to relocate the bolt. In this way the necessary adjustment is effected so that an amount of turn of the lever 25 which the space makes feasible will accomplish the clamping and unclamping. Moreover, once this adjustment has been accomplished and the head 21 returned to the undercut groove 23, the bolt functions in the normal way and holds its position in spite of operation of the lever 25 as above described.

I claim:

1. In a microtome, in combination with a knife, an object clamp and mechanism for reciprocating the object clamp relative to the knife for cutting off sections of a specimen, a knife holder having spaced clamps for clamping said knife, a microtome base supporting and guiding said knife holder for adjustment toward and from said object clamp, and means for locking said knife holder in adjusted position on said base including a locking bolt having its head engaged in an undercut groove in said base and extending upwardly through said knife holder, said groove being aligned with the direction of adjusting movement of said knife holder, means threaded on said bolt having a lever arm extending from between said knife clamps for oscillation of said threaded means to draw said bolt head into locking engagement with said groove, a split spring ring surrounding and frictionally retarding the shank of said bolt, and a pin in said knife holder cooperating with a split end of said ring for preventing rotation of said ring, said locking bolt being capable of being withdrawn with said knife holder to free said head from said undercut groove and expose said locking means for resetting of said locking bolt.

2. In a microtome, in combination with a knife, an object clamp and mechanism for reciprocating the object clamp relative to the knife for cutting sections of a specimen, a knife holder having spaced clamps for clamping said knife, a microtome base having a guide along which

said knife holder may be adjusted toward and from said object clamp, said base having an undercut groove parallel to said guideways for receiving the head of a locking bolt, said locking bolt extending upwardly through said knife holder and having its head engaged in said groove, a split spring ring surrounding and frictionally engaging the shank of said bolt, a pin in said knife holder engaging between the split ends of said ring for preventing rotation of said ring, and a lever having one of its ends threaded on said bolt and the other end extending from between said knife clamps for oscillation to lock and unlock said

knife holder with relation to said base, said locking bolt being capable of being withdrawn with said knife holder to free said head from said undercut groove to expose the same for resetting of said locking bolt.

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