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SLIT UNIT FOR OPTICAL INSTRUMENTS

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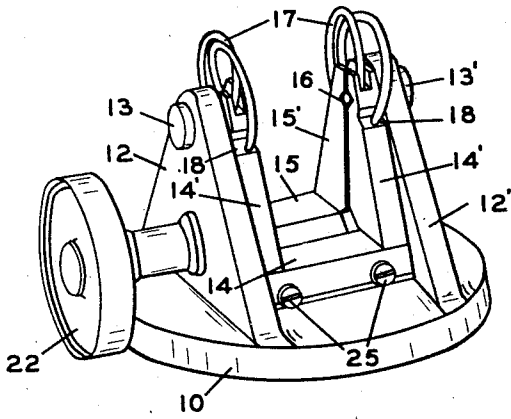


FIG. 1

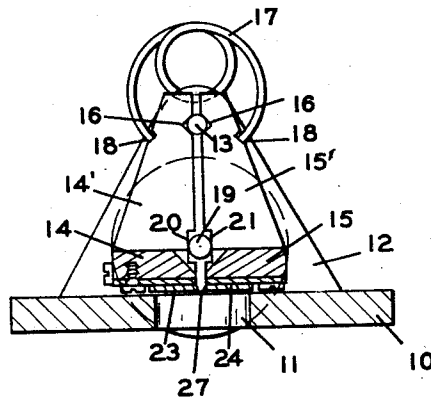


FIG. 3

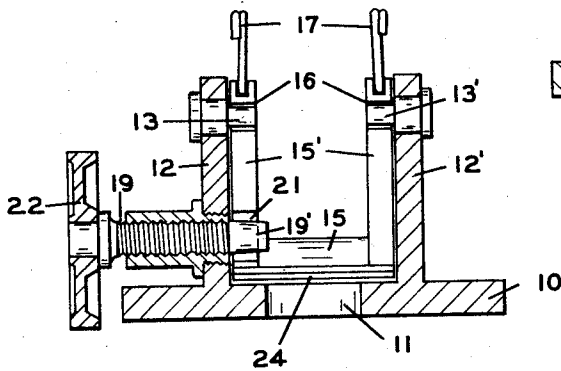


FIG. 2

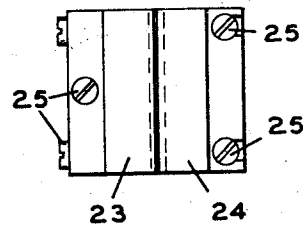


FIG. 4

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SLIT UNIT FOR OPTICAL INSTRUMENTS

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7 Claims. (Cl. 88—14)

This invention relates to optical instruments and more particularly it has reference to a slit unit which is adapted for use in various types of optical instruments such as spectrometers, spectrographs, monochromators and the like.

One of the objects of my invention is to provide an improved slit unit which will be sensitive and accurate in operation yet relatively simple and rugged in structure. Other objects are to provide a slit unit having swingably mounted jaws and cam means for adjusting same; relatively few moving parts which can be readily assembled or taken apart and slit adjusting means characterized by freedom from back-lash and lost motion. These and other objects and advantages reside in certain novel features of construction, arrangement and combination of parts as will hereinafter be more fully described and pointed out in the appended claims.

Referring to the drawing:

Fig. 1 is a perspective view of a slit unit embodying my invention.

Fig. 2 is a vertical sectional view taken through the plane of the slit.

Fig. 3 is a vertical sectional view taken transversely of the slit axis.

Fig. 4 is a plan view of the underside of the two jaw plates.

A preferred embodiment of my invention is disclosed in the drawing wherein 10 indicates a base provided with a central opening 11. Formed integrally with base 10 are the two spaced brackets 12 and 12' carrying the fixed pins 13 and 13', respectively. Mounted between the brackets are the two similar jaw carriers 14 and 15, each having the two spaced extensions 14' and 15', respectively. Each of the two extensions 14' and the two extensions 15' is provided, on its edge, with a substantially right angled notch 16. Springs 17 seated in notches 18 on each of the extensions 14' and 15' urge the jaw carriers 14 and 15 together so that the notches 16 of the adjacent pairs of extensions 14' and 15' are held, respectively, against the fixed pins 13 and 13'. Hence the two jaw carriers 14 and 15 are mounted to swing about the axis of the aligned pins 13 and 13'.

The springs 17 normally urge the jaw carriers together but they may be moved apart by means of a screw 19 which is threadedly mounted in bracket 12. The end of the screw 19 has a tapered portion 19' which contacts on opposite sides with the adjacent edges 20 and 21 on the extensions 14' and 15'. As the screw 19 is turned in one direction, by means of knob 22, the ta-

pered end 19' advances and exerts a camming action on the edges 20 and 21 so that the jaw carriers 14 and 15 are moved apart from each other against the action of springs 17 to provide a slit 27. Turning the screw 19 in an opposite direction will, of course, retract the tapered end 19' and permit the jaw carriers to move towards each other under the action of springs 17. On the under side of jaw carriers 14 and 15 the jaw plates 23 and 24 are respectively mounted by means of screws 25 thereby permitting the plates to be adjusted so that their two adjacent edges are parallel.

From the foregoing, it will be apparent that I am able to attain the objects of my invention and provide an improved slit unit which will be sensitive and accurate in operation, yet relatively simple and rugged in structure. The slit 27 is, of course, positioned opposite opening 11 so that the unit can be placed in an optical system. The slit 27 can be readily adjusted as to size by merely turning knob 22. Such adjustments are made without any lost motion or back-lash thereby rendering the slit highly sensitive and accurate. The jaw carriers can be easily and quickly removed by merely removing springs. Since there are only three moving parts, namely, the two jaw carriers and the screw, the unit is relatively simple in structure. Although I have shown my invention as embodied in a bi-lateral slit, having two jaws moving equally in opposite directions, it is obvious that my invention can be equally well applied to a slit unit having one fixed jaw and one movable jaw. The jaw carrier 14, for example, could be rigidly secured so that the slit 27 could be varied as to width by means of screw 19 which would act to move the jaw carrier 15. Other modifications can obviously be made without departing from the spirit of my invention.

I claim:

1. A slit unit for optical instruments comprising a base, a pair of jaws mounted on said base to turn about a common axis substantially parallel to the edges of said jaws, yieldable means normally urging said jaws together and means for moving said jaws about said axis and holding them in adjusted position.

2. A slit unit for optical instruments comprising a base, a pair of jaws mounted on said base to swing about an axis substantially parallel to the edges of said jaws and move to and from each other, yieldable means normally urging said jaws together and cam means for moving said jaws apart.

3. A slit unit for optical instruments comprising a base, a pair of carriers movably mounted on said base to swing about a common axis, a jaw on each carrier, yieldable means for normally urging said jaws together and a screw mounted on said base, said screw having a tapered end which contacts with said carriers whereby the distance between said jaws may be varied.

4. A slit unit for optical instruments comprising a base having two spaced brackets, a stub shaft on each of said brackets, a jaw carrier having spaced extensions each of which is provided with a notch, said carrier being positioned between said brackets with the notches engaging the respective stub shafts whereby said carrier is swingably mounted, a first jaw carried by said base, a second jaw mounted on said carrier and adapted to be moved to and from said first jaw and means for moving said second jaw.

5. A slit unit for optical instruments comprising a base having two spaced brackets, a stub shaft on each of said brackets, a pair of jaw carriers, each of said carriers having two extensions, each extension having a notch on its edge, said carriers being positioned between said brackets

with the notches of each carrier contacting, respectively, with opposite sides of said stub shafts, a jaw plate on each of said carriers, spring means for normally urging said carriers together, a screw threadedly mounted in one of said brackets, said screw having a tapered end which contacts with said carriers whereby said jaw plates may be adjustably separated.

6. A slit unit for optical instruments comprising a base, a pair of jaws mounted on said base, cylindrical shaft means carried by said base, notch means on one jaw for bearing engagement with said shaft means, yieldable means for urging said one jaw toward the other jaw, and means for adjustably moving said one jaw away from the other jaw.

7. A slit unit for optical instruments comprising a base, a pair of jaws mounted on said base, cylindrical shaft means parallel to the edges of said jaws carried by said base, notch means on one jaw for bearing engagement with said shaft means, yieldable means for urging said one jaw toward the other jaw, and means for adjustably moving said one jaw away from the other jaw.

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