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A microfiche reader as a petrographic aid

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We have modified a Micron 750 microfiche reader to allow examination of thin sections in plane-polarized or crossed-polarized light. Although others have used a microfiche reader for looking at thin sections, many with whom we talked had not heard of such an application. The device is intended primarily as a teaching and laboratory aid. It can be used for quickly scanning a slide, discussing features with a coworker, and for point counting. It is especially useful for illustrating textures and minerals in a classroom situation.

The "petrographic" microfiche reader is functional and easy to use. It has several positive features: (1) good natural and interference colors; (2) freedom of movement in the horizontal plane; (3) adequate low power magnification; (4) a greater field of view than do petrographic microscopes at similar magnification; and (5) it is relatively inexpensive.

An unmodified microfiche reader presents several problems if it is to be used as a petrographic instrument: (1) the stage does not rotate; (2) there are no polarizing filters; (3) the maximum magnification is limited due to parts availability; (4) the light intensity is somewhat inadequate in a normally lit room; and (5) frequent changes in focus are required to compensate for the imprecise level of the moveable carriage.

In our design, a rotating stage was constructed that replaces the glass plates normally used to hold the microfiche (Fig. 1). The rotating stage is machined from aluminum and consists of two plates. The lower plate attaches to the existing moveable carriage and has an open bore in its center. The circular upper plate has a matching hole and flange that fits snugly into the hole of the lower plate. A proper fit allows smooth rotation but should not spin freely. The central aperture is somewhat smaller than the length of a standard thin section. The circular plate has adjustable buttresses to hold the slide. Though the slide can be scanned without handling, there is only one position that will be at the center of rotation.

A polarizing lens placed just above the condensing lens serves as a fixed lower polarizer. The upper polarizer can be integrated into an arm which slides laterally across the optical field. This allows for the easy insertion of the upper

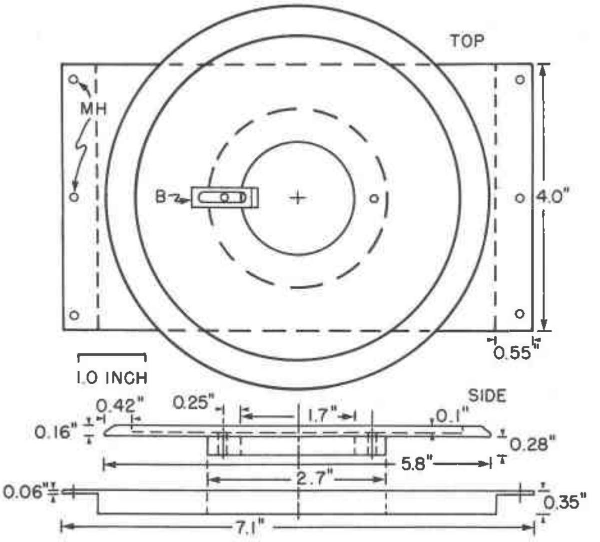

Fig. 1. Diagram of top and side view of rotating stage. B-buttress; MH-mounting holes (6 total). The rotating stage assembly mounts on to the existing moveable carriage. This design is for the Micron 750 reader.

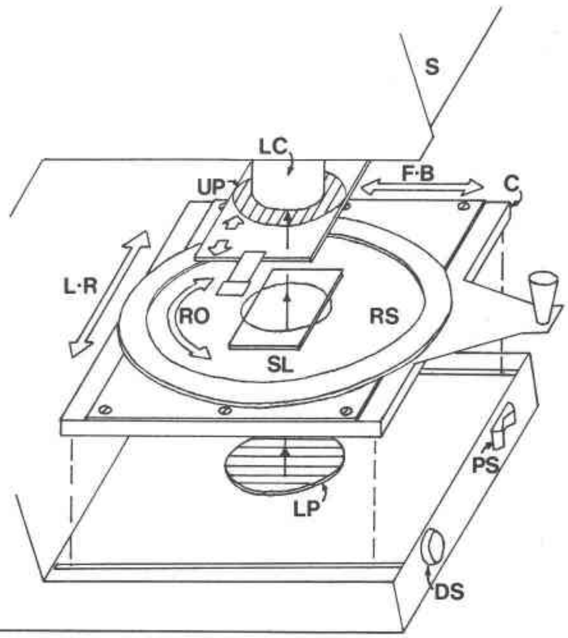

Fig. 2. Simplified exploded view of modification. Note that use of existing moveable carriage allows movement in the X-Y plane without handling slide. LP-lower polarizer; UP-upper polarizer; C-moveable carriage; RS-rotating stage; LC-lens cylinder; S-viewing screen; SL-slide; DS-dimmer switch; PS-power switch. Freedom of movement: F-B-forward and backward; L-R-left to right; RO-rotational.

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polarizer from the side of the machine. Figure 2 is a simplified drawing of the modifications.

The largest expense may be the purchase of the reader. Used readers are probably available from microform equipment dealers. The rotating stage was fabricated for $100 at a small machine shop. The original 36× lens was replaced by a used 72× lens purchased for $75 from a microform equipment dealer. The resolution is very good at the lower power and acceptable at the higher power, though the increased magnification results in the need for greater illumination. A higher intensity light bulb and an appropriate transformer were installed to compensate. A dimmer switch, purchased for $9 at a hardware store, was inserted into the circuit to provide a complete range of brightness. Finally, two polarizing camera filters were purchased for $18. Our total cost was $202.