

MEDICAL INSTRUMENTS-II

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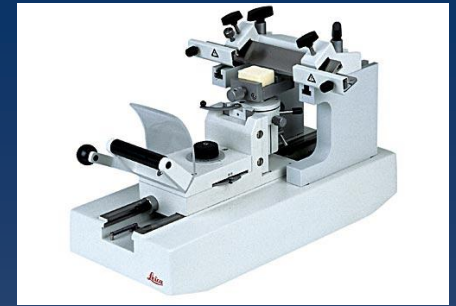
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Sledge microtome

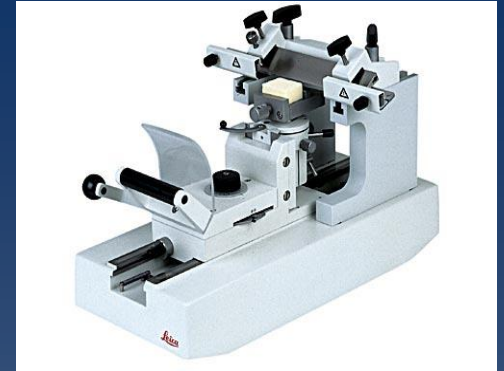


Sledge microtome



- ◆ Originally designed for cutting sections of very large blocks of tissue (eg. whole brains)
- ◆ Used primarily for large blocks, hard tissues, whole mounts.
- ◆ Especially useful in neuropathology and ophthalmic pathology.
- ◆ It is similar to a sliding microtome
- ◆ Usually a **wedge-shaped knife** is used.

Mechanism of action:



- ◆ The block holder is mounted on a steel carriage which slides backwards and forwards on guides against a fixed horizontal knife.

Components

1. Angle of tilt adjustment
2. Knife clamps
3. Block holder
4. Course feed adjustment
5. Operating handle
6. Thickness gauge
7. Adjustment locking nut
8. Block adjustment screw
9. Split nut clasp

Base Sledge microtome parts

◆ Operating handle

- **handle** advances – the sledge, will move along the runners and will also advance the specimen, the selected amount (thickness).

◆ Thickness control

- A knob, calibrated in microns, is used to select the thickness of sections to be cut from $1\mu\text{m}$ – $40\mu\text{m}$, in $1\mu\text{m}$ steps. Always set the thickness by turning the knob anticlockwise. If the thickness has to be reduced then turn clockwise past the required thickness, then anticlockwise.

Base Sledge microtome parts

◆ **Coarse advance/trim control**

- Quickly raises or lowers the specimen 450 μ m per turn.

◆ **Specimen holder**

- Specimens are clamped in the holder fitted
- can be raised and lowered or removed after releasing the clamp lever

◆ Knife clamps

- Two screws, turned by a lever , are used to fix the knife in the knife clamp and the knife clamp in the knife block
- The cutting angle of the knife is adjustable from 0-40°. Slew angles of the knife can be obtained by loosening the knife block clamp levers and the knife clamp levers and moving knife to slew angle required.

◆ Knife guards

- Each knife guard can be moved to the central position to cover the working area of the knife, or to the outer position while section cutting.
- The **black knobs** secure the guards in the chosen position.

◆ Side pillars

- In normal use, these pillars slope inwards slightly. For large area sections they can be unbolted from the base, swapped left to right and refitted, so that they slop outwards, so providing more space.

OPERATION

- ◆ **Trimming the Specimen**
- ◆ Fit the specimen block securely into the appropriate block holder on the microtome to trim excess material from the surface of the specimen block:
 - a. First move the sledge towards the knife and adjust the specimen height using the coarse advance so that the specimen is just below the knife.
 - b. Set the thickness control to cut thick sections, eg: 20 μ m, and move the sledge back and forth repeatedly to trim the specimen.
 - c. Or set the thickness control to zero and alternately raise the specimen slightly using the coarse advance and move the sledge forward then backwards. This method is quicker but should only be used if the operator is experienced in the use of base sledge microtomes.

OPERATION

◆ **Fitting the Object Holder**

- ◆ Pull the sledge away from the knife holders. Secure the required object holder by placing it in the holder in the sledge slide. Set to correct height and lock by tightening clamp lever
- ◆ Note that the clamp lever has a ratchet with its movement limited to prevent the lever being left in positions where it could impact on other parts during sectioning.

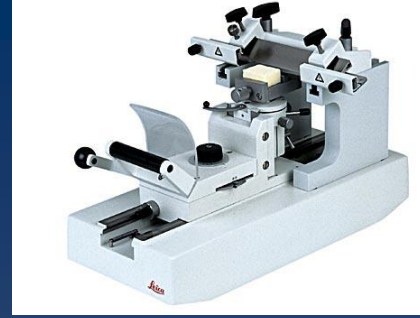
◆ **Fitting and Adjusting the Knife**

- a. Slacken the knife clamp levers just enough to let the knife slide into the knife clamps from the side.

OPERATION

- b. Insert the knife, taking care to avoid touching the edge against the metal surfaces.
- c. Check that the knife lies flat on the pad pieces in the knife clamps and that the heel of the knife is not caught up on the slot in the knife clamps.
- d. Screw the knife clamp levers down just sufficiently to steady the knife in position.
- e. Slacken the knife block clamp levers . Set the knife holders to the desired slew angle, ensure the knife clamps still cover the ends of the knife. Set the knife to the desired cutting angle and tighten the knife clamping levers.
- f. Check that the knife is still at the desired slew angles and tighten the knife block clamp levers.

Advantages:



- ◆ Heavy , very stable, not subject to vibration.
- ◆ Knife large(24 cm in length) and usually wedge shaped –less vibration .
- ◆ Adjustable knife holding clamps allow tilt and angle of the knife to the block to be easily set
 - used for cutting celloidin sections by setting the knife obliquely
 - paraffin wax embedded sections are more easily cut .



Disadvantages

- ◆ Slower in use than rocker or rotary microtome
- ◆ With practice, sections from routine paraffin blocks can be cut as quickly as on any other type of microtome.

Sliding microtome

- ◆ Designed for cutting celloidin-embedded tissue blocks.
- ◆ The knife or blade is stationary, specimen slides under it during sectioning.
- ◆ Also used for paraffin –wax embedded sections.

