

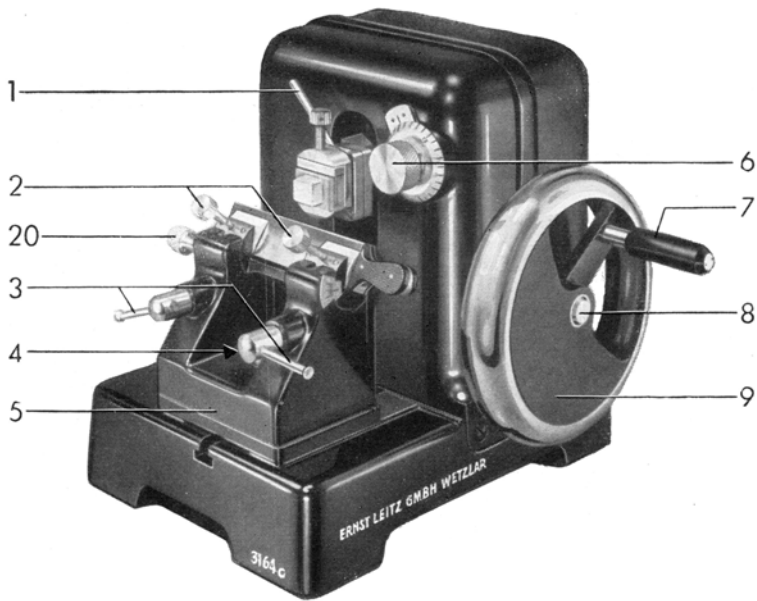
Leitz

**Large Minot
Rotary Microtome**

No. 1212

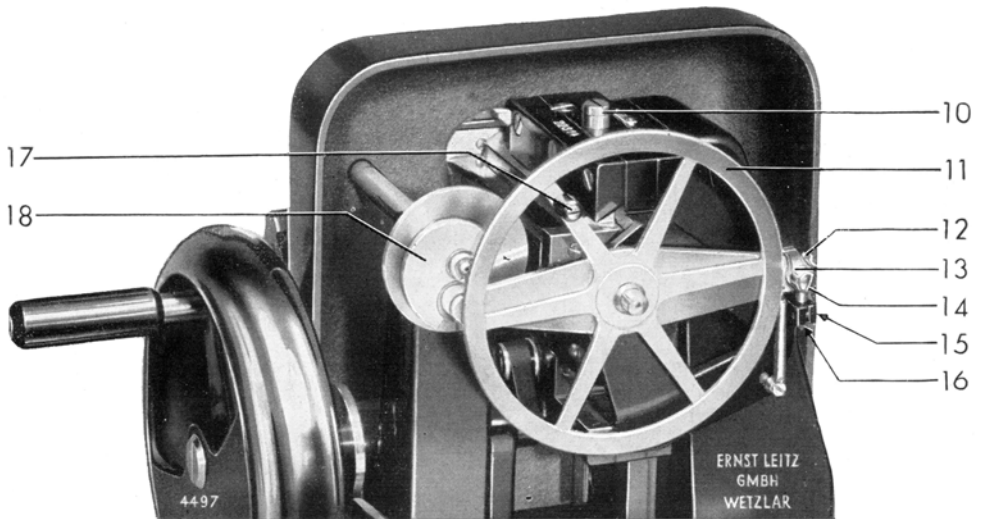
ERNST LEITZ GMBH WETZLAR

53-3/Engl.



- 1 Lever for fixing the object clamp
- 2 Clamping screws for mounting the knife
- 3 Levers for locking the knife clamps
- 4 Holding screw for complete knife block
- 5 Knife block
- 6 Graduated control for setting the thickness of sections
- 7 Handle of hand-wheel
- 8 Hand-wheel axis
- 9 Hand-wheel

- 10 Locking lever for securing vertical sledge
- 11 Micrometer gear wheel
- 12 Pawl releasing lever
- 13 Pawl
- 14 Screw and spring sleeve for adjusting spring pressure
- 15 Fixing screw for adjusting screw 16
- 16 Adjusting screw controlling the specimen feed
- 20 Knurled screw for fitting conveyor belt



Scope of the Rotary Microtome

The large Minot rotary microtome is designed for automatic specimen feed and rapid cutting of sections ranging from 1 to 25 microns. The cutting speed may be raised to 2 sections per second so that the instrument is ideal for cutting large series of sections. If desired a motor can be fitted in place of the hand-wheel for fully automatic operation (quotation on request).

The instrument is primarily intended for specimens that are embedded in paraffin and cut well, but celloidin sections can also be made. No provision is made for cutting frozen material.

Unpacking and Setting up the Microtome

The microtome is delivered with the hand-wheel packed separately. This hand-wheel (9) is fitted on to the axis (8) and secured by a screw. The handle (7) is attached to the wheel. The vertical sledge of the microtome is secured in transit by a green-painted fixing screw under the base and an intermediate piece of the same colour inside the housing. Both these parts must be removed before the microtome is operated, and the sledge locking lever (10) must be swung sideways to release the vertical movement of the sledge with object clamp.

Operating the Microtome

The hand-wheel operates the vertical sledge with object clamp and the coupled specimen feed through a horizontal sledge and micrometer arrangement with large gear-wheel, while the knife remains stationary. The thickness of sections is variable between 1 and 25 microns (control 6). The series of sections are taken away from the knife by a conveyor belt, either hand-operated or automatically coupled to the hand-wheel (see page 5).

The **knife-block (5)** is mounted by means of a holding screw (4), on the base-plate where it can be moved forwards and backwards and also sideways to allow for large object blocks and enable the knife to be used along all parts of its edge. The knife clamps are rotatable in two beds their inclination and that of the knife being indicated on a scale. After the required inclination has been set the clamping levers (3) must be tightened. Minot knives with 15 cm. (6") cutting edge are best suited. For relatively hard and tough specimens a wedge-shaped knife is particularly recommended (profile c), while for average requirements a knife which is concave on both sides (profile b) will be satisfactory. The knife is inserted into the knife clamps from the side and secured by means of the clamping screws (2).

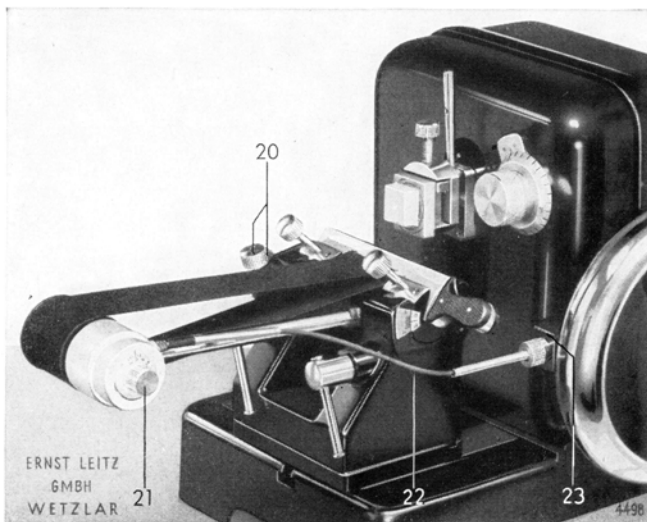
The standard knife-block for using the knife horizontally can be replaced by a special block for clamping the knife in an oblique position as it is required for celloidin work.

The **object clamp** fitted to a ball-and-socket head easily accessible outside the housing is clamped in position by a lever (1) and can be replaced by a simple paraffin stage of 30 mm. diameter.

The **micrometer and specimen feed mechanisms** can be inspected after the hinged rear cover of the microtome housing has been swung back. The rotation of the hand-wheel is transmitted to the vertically moving sledge via a crank motion. The vertical sledge carries a large gear-wheel (11) firmly fitted to the micrometer spindle. The latter actuates the horizontal sledge the front end of which carries the object clamp. A pawl (13) engages the gear-wheel (11) which, through a cam (18) effects the movement of the micrometer spindle and thereby determines the thickness of sections which is set on the graduated control (6) at the front of the microtome housing. The pawl (13) may be disengaged through a lever (12), so that the large gear-wheel and consequently the specimen feed may be operated by hand (control 17). This hand operation of the specimen feed should not be used while the pawl engages the gear wheel.

The rotation of the large gear-wheel from one tooth to another corresponds to a specimen advance of 1 micron. The click of the pawl thus indicates the number of microns the specimen is raised. An adjusting screw (16) is provided for ensuring proper functioning of the specimen feed in accordance with the setting of the thickness control (6). This adjusting screw can be turned by a screw-driver after the fixing screw (1) has been loosened. If the pawl (13) does not engage the gear-wheel (11) or specimen advance by the micrometer spindle is not identical with the number of microns set at the outside thickness control (6) the pawl spring pressure must be varied. This can be done by loosening the adjusting screw (14) and turning the lower spring sleeve in an anticlockwise direction. The screw must be properly tightened after adequate spring pressure for the pawl has been obtained.

Before the microtome is operated the equipment should be checked as to proper clamping of the knife-block, the knife and the object.



- 20 Knurled screw for fitting conveyor belt
- 21 Adjusting screw for belt advance
- 22 Bowden control cable of the automatic conveyor belt
- 23 Screw thread to fit Bowden control cable

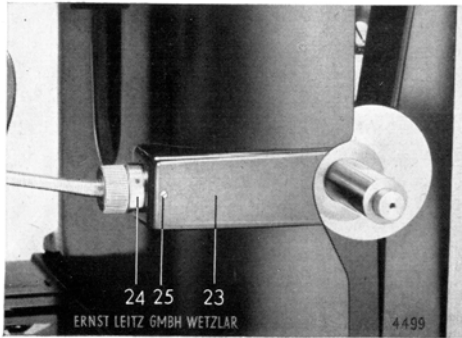
Conveyor Belt for Sections

The sections as they come off the knife are received either by a hand-operated **simple conveyor belt** or an **automatic conveyor belt** which can be obtained as accessories and fitted to the thread at the left side of the knife block (two threads 20).

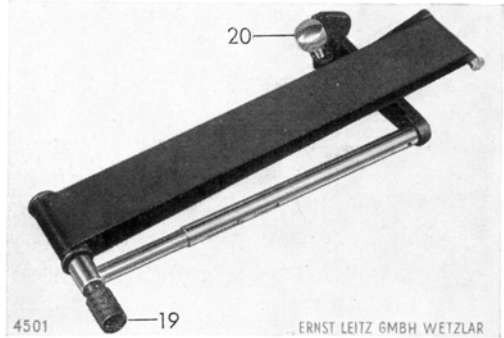
The simple conveyor consists of a bracket with a belt running on two axes and a knurled control (16) for moving the belt by hand as required. The automatic conveyor belt is of similar construction but the movement of the belt is automatically effected through a Bowden control cable (22) when the hand-wheel is turned. The Bowden cable is fitted to a thread (23) at the side of the microtome near the hand-wheel, while the automatic advance of the belt can be regulated by the scale setting (21) in accordance with the cutting thickness used. The maximum advance is approx. 30 mm.

When attaching the automatic conveyor or after some possible stretching of the Bowden cable after frequent use, the following adjustment should be made:

Loosen fixing screw (25) at the side of the Bowden cable socket and move the cross-hole screw (24) a few turns anticlockwise. The belt advance scale is set to the first marking following the zero line by means of control 21. While turning the hand-wheel the cross-hole screw (24) is screwed into the Bowden cable socket (23) at the side of the microtome until the movement of the belt is started. This adjustment will not be affected when the conveyor is taken off the microtome, no subsequent work being required.



- 23 Bowden cable socket at the side of the microtome
- 24 Cross-hole screw for Bowden cable adjustment
- 25 Fixing screw for Bowden cable



Simple conveyor belt:

- 19 Handle for advancing belt
- 20 Knurled screw for attaching conveyor belt to knife block

Care and Cleaning of the Microtome

The instrument should be regularly cleaned by the application of pure benzine and subsequently oiled with the special oil supplied. A high-grade acid-free light oil (sewing machine oil) can also be used. The **oiling points** have red markings, i. e.

- (1) over the hand-wheel axis,
- (2) in the centre of the lower bed of the horizontal sledge,
- (3) at the rear end of the crank-shaft slide.

In addition

- (4) both the slideways of the vertical sledge must be oiled.

The **application of vaseline** is necessary on all ground surfaces subjected to less frequent motion, i. e.

- (1) the slideways of the horizontal sledge,
- (2) the micrometer spindle,
- (3) the ball-and-socket joint of the object clamp,
- (4) the bearings of the two knife clamps,
- (5) the mounting surface for the knife block on the microtome base.

When not in use the microtome should be suitably covered to exclude dust.

ERNST LEITZ GMBH WETZLAR
GERMANY

Branch Works: Ernst Leitz (Canada) Ltd., Midland, Ontario