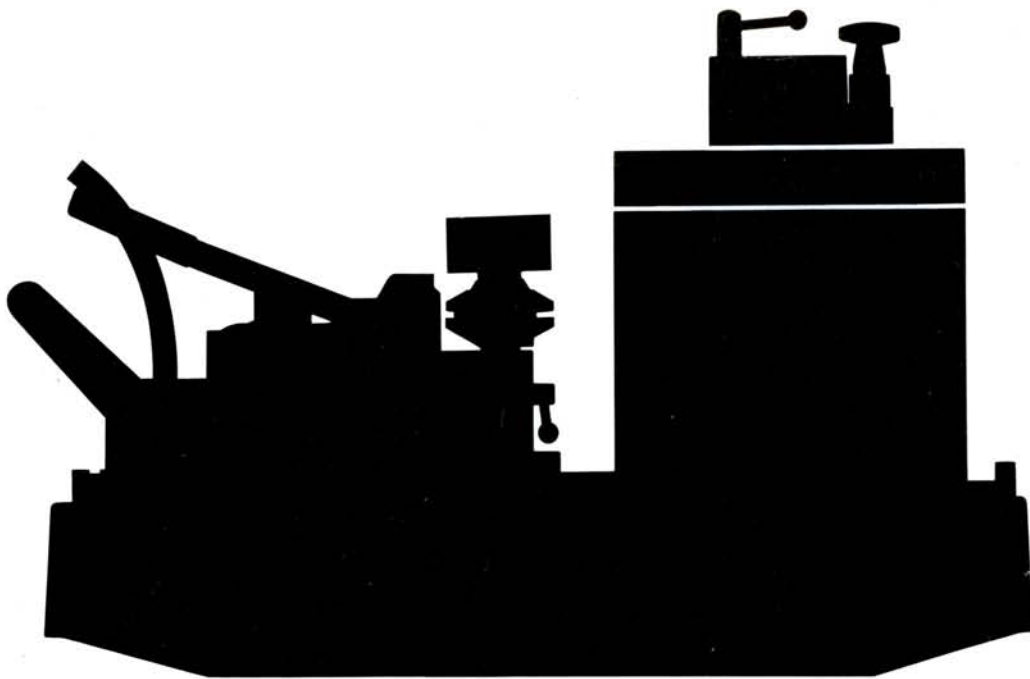


# Base Sledge Microtome 1401



(To be used only in conjunction with Instructions 530-27)

## Instructions



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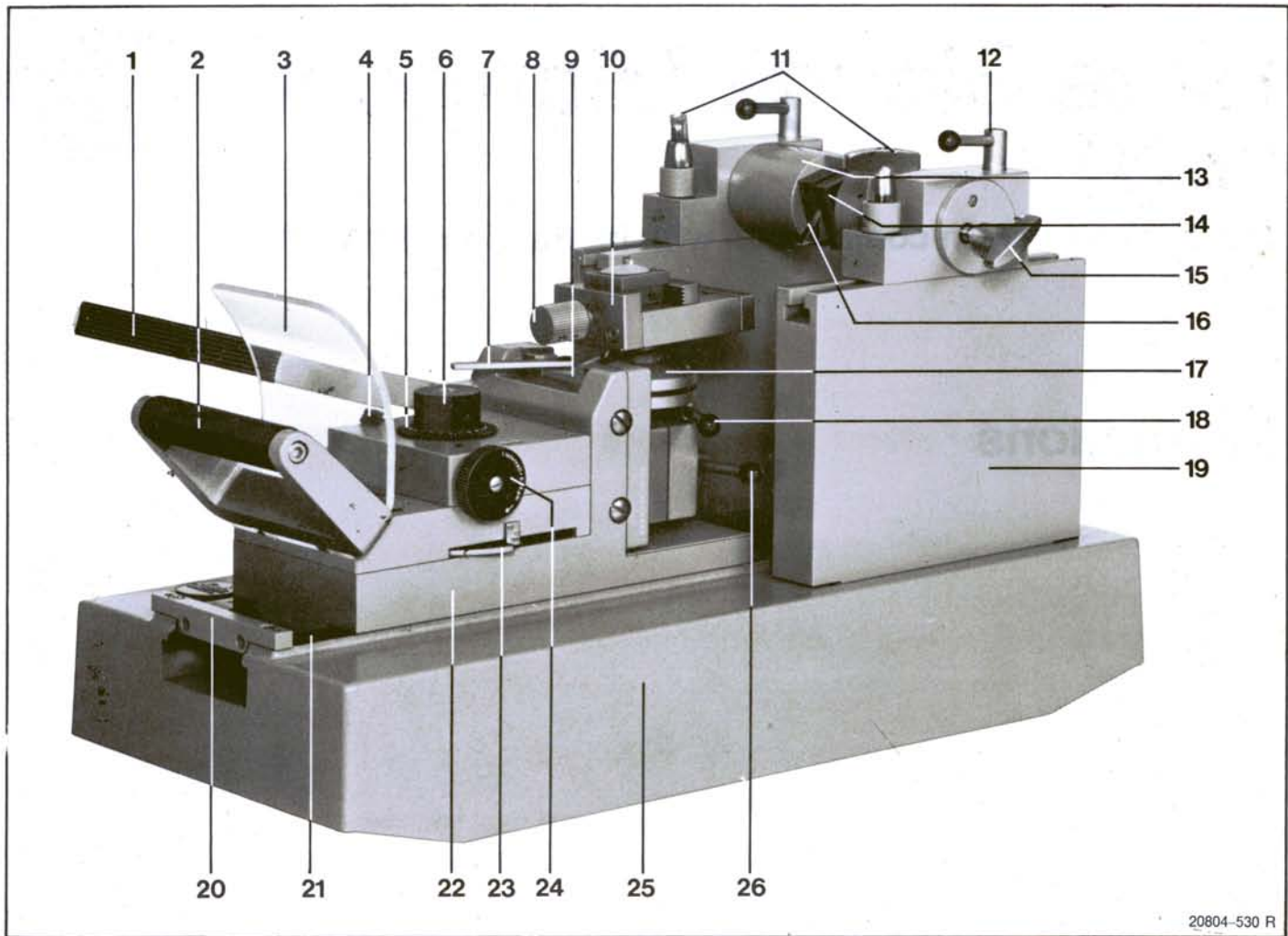


Fig. 1 Base Sledge Microtome 1401

- |    |  |    |   |
|----|--|----|---|
| 1  | Lever for the coarse vertical adjustment of the object sledge                      | 12 | Clamping lever for fixing the angle of inclination adjustment   |
| 2  | Hand grip  | 13 | Glass knife holder  |
| 3  | Hand guard   | 14 | Clamping jaws   |
| 4  | Lever for operating the fine drive for section thicknesses below 1 $\mu\text{m}$   | 15 | Screw for fixing the glass knife  |
| 5  | Scale with orientating graduation for the vertical adjustment of the object sledge | 16 | Glass knife   |
| 6  | Knurled knob for the vertical adjustment of the object sledge                      | 17 | Ball-and-socket clamp   |
| 7  | Lever for arresting the coarse vertical adjustment of the object sledge            | 18 | Arresting lever for the ball-and-socket clamp   |
| 8  | Screw for fixing the object in the object clamp                                    | 19 | Knife block   |
| 9  | Object sledge  | 20 | Front stop for the transport sledge   |
| 10 | Object clamp   | 21 | Guide tracks for the transport sledge   |
| 11 | Wing nuts for attaching the glass knife holder to the knife blocks                 | 22 | Transport sledge  |
|    |  | 23 | Section thickness adjustment 1-40 $\mu\text{m}$   |
|    |  | 24 | Knurled screw for setting section thickness below 1 $\mu\text{m}$ (0.25 $\mu\text{m}$ interval between click-stops) |
|    |  | 25 | Base  |
|    |  | 26 | Clamping lever for the object holder  |

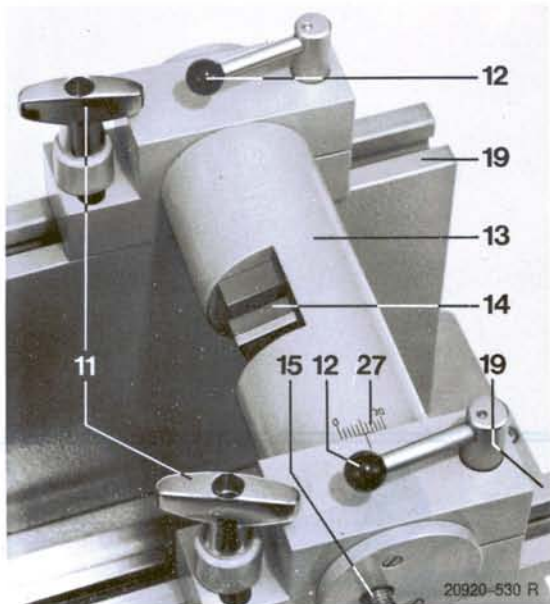
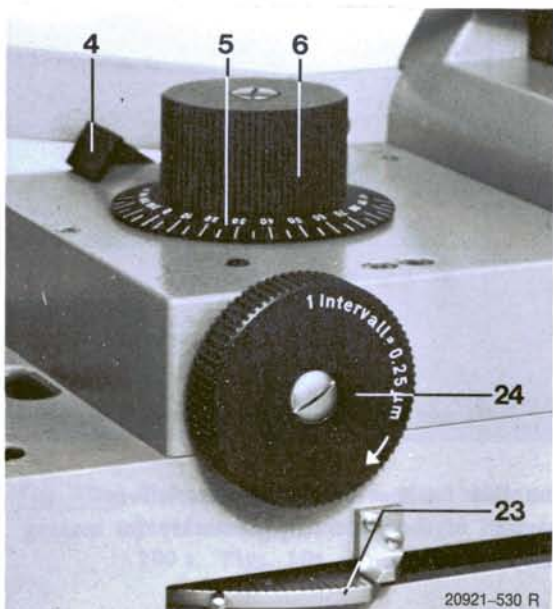


Fig. 2

11 Wing nuts for attaching the glass knife holder to the knife blocks; 12 Clamping lever for arresting the angle of inclination adjustment; 13 Glass knife holder; 14 Clamping jaws; 15 Screw for fixing the knife; 19 Knife block; 27 Angle of inclination scale

Fig. 3

4 Lever for operating the fine drive for section thicknesses below  $1\ \mu\text{m}$ ; 5 Scale with orientating graduation for the vertical adjustment of the object sledge; 6 Knurled knob for the vertical adjustment of the object sledge; 23 Section thickness adjustment ( $1\text{--}40\ \mu\text{m}$ ); 24 Knurled screw for setting section thicknesses below  $1\ \mu\text{m}$  ( $0.25\ \mu\text{m}$  interval between click stops)



## 1. Preparing for operation

See Instructions Base Sledge Microtome 140v.  
No. 530-27

## 2. Cutting

- 2.1 Move the arresting lever (1. 7) of the coarse vertical adjustment of the object sledge (1. 9) to the right and move the object clamp into the lower position.
- 2.2 Mount the object in the object clamp (1.10) and fix it with screw (1. 8).
- 2.3 Mount the glass knife and fix it with screw (2. 25). Loosen the two clamping levers (2. 12) by turning them to the left and set the angle of inclination by turning the glass knife holder (2. 13) to the desired scale part (2. 27). Firmly tighten the clamping lever (2. 12) by turning it to the right.
- 2.4 Move the object below the knife with the transport sledge (1. 22). Release the ball-and-socket clamp with the clamping lever (1. 18) and align the object with the knife. Firmly tighten lever (1. 18).
- 2.5 Release wing nuts (2. 11) and align the glass knife with the object by displacing it to the right or to the left. Retighten wing nuts.
- 2.6 Raise the object with lever (1. 1) up to a few mm below the knife edge (the object must not touch the glass knife). Clamp the object sledge by swivelling the lever (1. 7) to the left.
- 2.7 If necessary correct the position of the glass knife relative to the object as described under 2. 5.
- 2.8 Execute cutting movement by moving the transport sledge to and fro. Rotate the knurled knob for the coarse vertical adjustment of the object (1. 6) when the object is in front of the knife. Cut a plane surface.
- 2.9 Move the section thickness adjustment (1. 23) fully to the front and switch the microtome from normal to thin-section cutting by swivelling the lever (3. 4).
- 2.10 Adjust the object feed by turning the knurled screw in the direction of the arrow before each cutting operation: feed =  $0.25\ \mu\text{m}$  from click-stop to click-stop. Thus section thicknesses of  $0.25, 0.5, 0.75, 1.0, 1.25, 1.5\ \mu\text{m}$  etc. can be set by means of this knurled screw.
- 2.11 By swivelling the lever (3. 4) you can switch the microtome from thin-section to normal-section cutting at any time. Section thickness is now again set by means of the section thickness adjustment (3. 23).

### 3. Cleaning and maintenance

See Base Sledge Microtome 1400,  
No. 530-27, para. 4

### 4. The making of glass knives

Glass knives must be newly made immediately before use since they lose their sharpness after prolonged storage. Only strain-free surface-polished optical glass of about 5 mm thickness must be used. This can be obtained either in strips of about 30 mm width or taken from a sheet of glass.

The following tools are necessary for the making of glass knives:

- 1 tile-breaking pliers (4.30)
- 2 flat pliers whose gripping surfaces must be covered with lead foil or plastic foil (4.29)
- 1 steel-wheel glass cutter (4.28)
- 1 ruler
- 1 template for scoring the glass knives (Fig. 5)

Cut a strip of about 30 mm width off the glass plate. To do this score the glass with the glass cutter (4.28) evenly and continuously (use the ruler), place the glass plate with the scored line facing downwards between the jaws of the tile-breaking pliers (4.30) (scored line on the rubber sleeve) and detach the glass strip by slight pressure with the pliers. With the flat pliers pull pieces of glass of about 30 mm width off the glass strip after scoring them for a length of about 5 mm with the glass cutter (Figs. 6, 7).

The piece of glass obtained as shown in Fig. 7 is placed on the template so that the fracture edge comes to lie along the 1 mm mark (Fig. 8). Score with the glass cutter in the direction of the arrow, to obtain the final knife body (9.1) with the edge (9.1') and the waste piece (9.2), which is now detached from the knife (9.1) with the two flat pliers. For this operation the pliers should be pulled obliquely downwards.

The quality of the glass knife edge (Fig. 10a) is decisive for the success of section cutting. If the quality of a section is unsatisfactory, the knife should be adjusted so that a different portion of the cutting edge is used or a new glass knife should be made. Even with perfect mastery of the method described here it is impossible to produce knives of always uniform quality (flaws in the glass, worn glass cutters, differential pressure during scoring and breaking).



Fig. 4 Tools for making glass knives

- 28 Steel wheel glass cutter
- 29 Flat pliers
- 30 Tile-breaking pliers

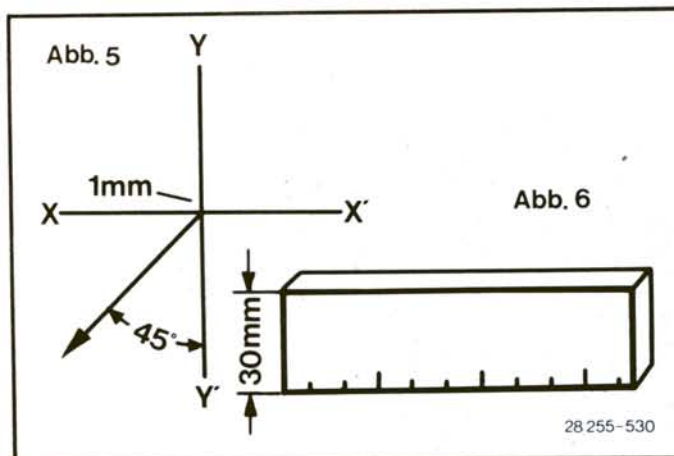
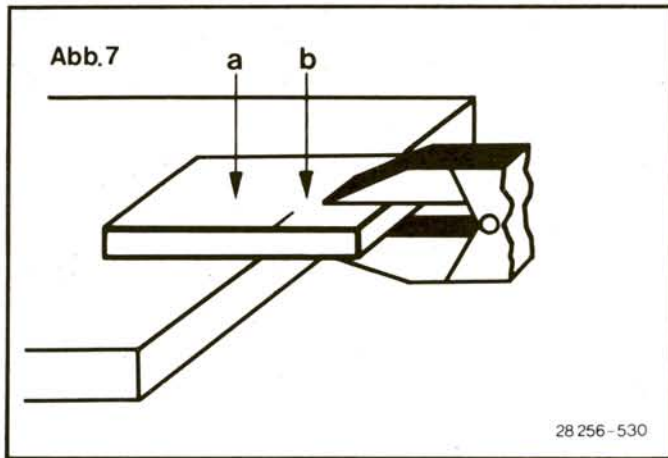


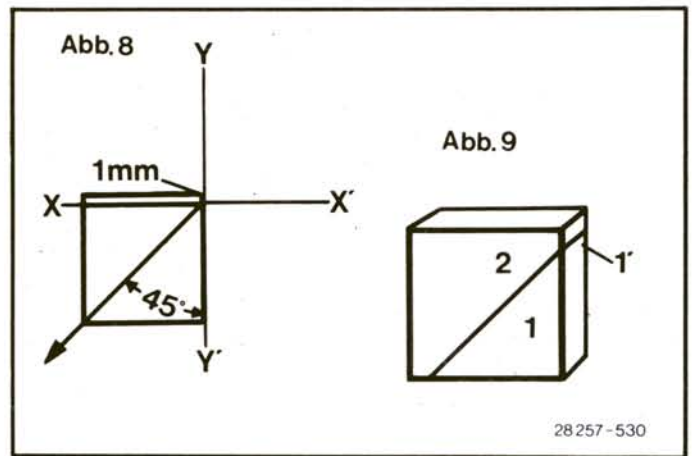
Fig. 5 Template for the scoring of glass knives

Fig. 6 Diagram of the glass strip necessary for making glass knives.



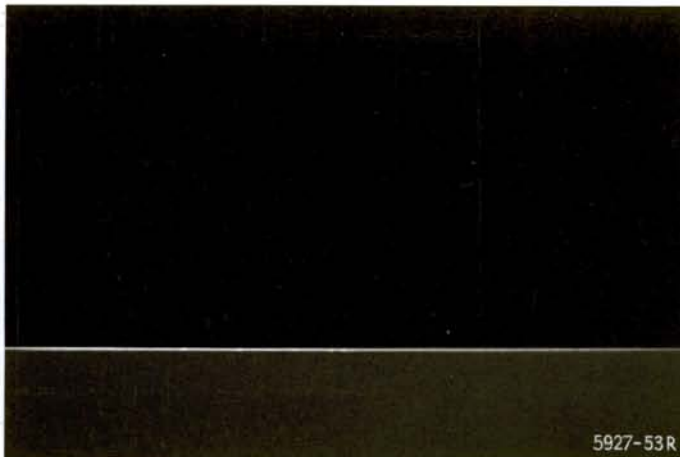
**Fig. 7** Diagrammatic representation of the breaking procedure

- a Press the glass strip firmly onto the table with one hand
- b The scored line faces upwards and is precisely above the edge of the table

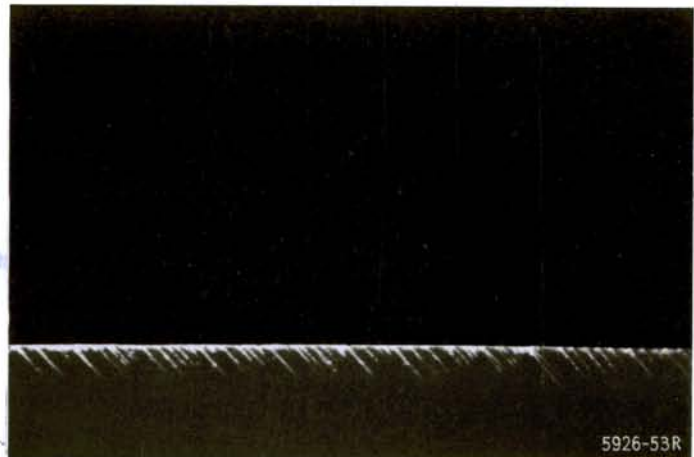


**Fig. 8** Template with glass body in position for scoring the glass knife at an angle of  $45^\circ$

**Fig. 9** Diagrammatic representation of the scored piece of glass



**Fig. 10a** Photomicrograph of a glass knife edge in incident light (incident-light illuminator). 200 x. Figs. 10a shows a perfect knife edge



**Fig. 10b** of the glass knife edge; useless, jagged portion.

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