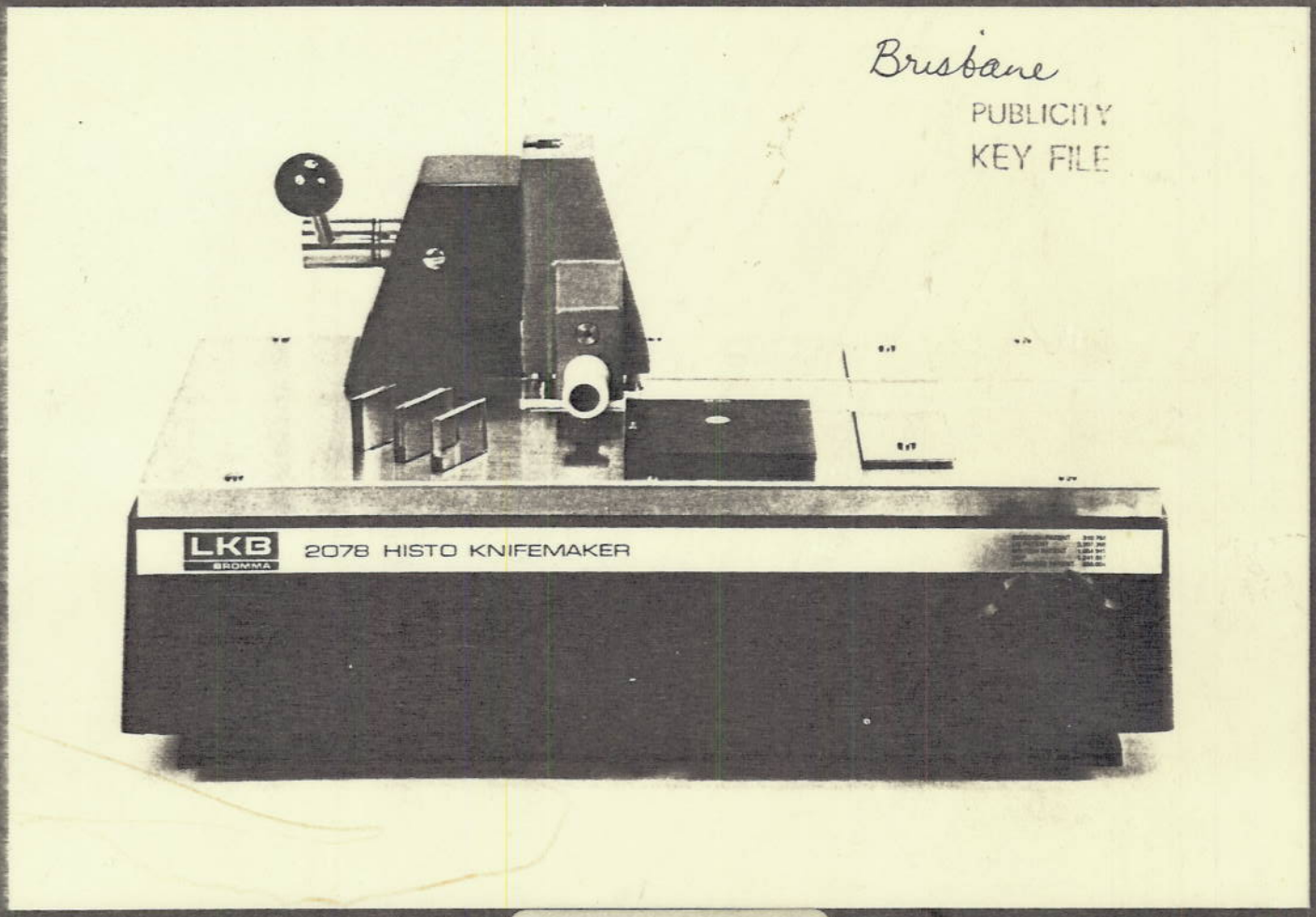
Instruction

LKB

LKB 2078 Histo KnifeMaker



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I Introduction

With the LKB 2078 Histo KnifeMaker you can easily make Ralph[1] type glass knives up to 38 mm long to be used for semithin sectioning of specimens embedded in soft plastic and paraffin. The main parameters affecting the knife angle are a) the positioning of the fulcrum supporting the glass strip in relation to the score mark and b) the distance between the score and the pressure studs.

The Histo KnifeMaker accepts glass strips 6 mm – 8 mm thick and 25 mm or 38 mm wide, which are the strip sizes commonly used. The knife angles can be varied within the approximate range 15° – 80°. The intermediate range 45° – 65° is mainly intended for sectioning of plastic embeddings, and smaller angles for material in paraffin embeddings.

II Installation

The Clamping Head has two pressure studs 10 and 10 a (see Figure 2). Check that the studs are placed in the outer positioned threaded holes (maximum distance apart). If this is not the case, as in Figure 2, see IV C for correction. Swing the lever 2 (see Figure 3) to its rearmost position. This brings the Clamping Head to its upper position and the Histo KnifeMaker is ready for operation.

1) Bennett et al., Stain Technol, 51 (1976) 71

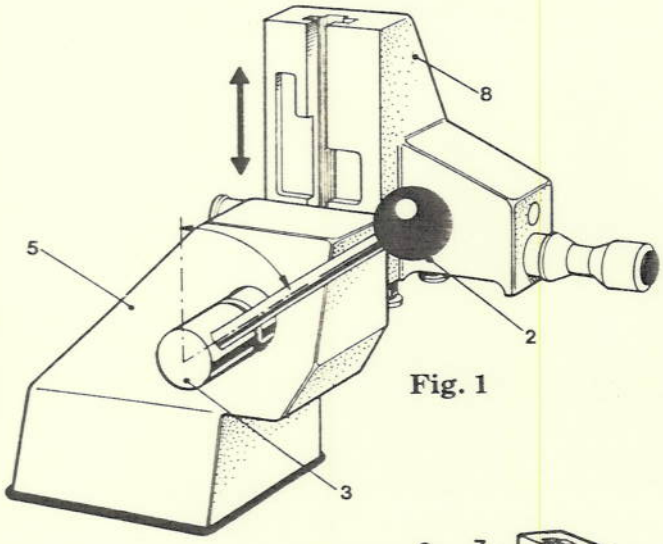

Fig. 1

III Operating Instructions

Making Ralph type Glass knives for semithin sectioning.

1. Clean the glass being used with detergent. Rinse thoroughly in water and dry.
2. Figure 3 shows the Guide Plate (21) for the glass strips. Check that the figures (25 mm or 38 mm) on the guiding side (i.e. rear edge) of the plate correspond to the width of the glass strips to be cut. If not, lift the Guide Plate until it can be turned and set back into the correct position for guiding the glass strip.

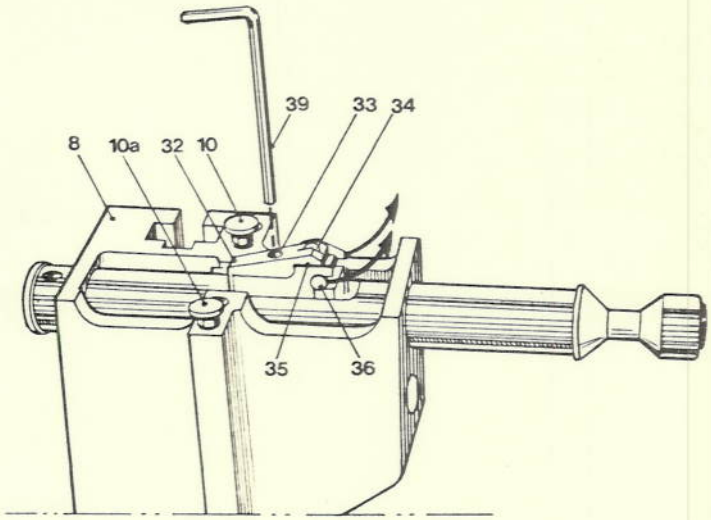

Fig. 2

3. Check that the Breaking Knob (18) (see Figure 3), is in its counter-clockwise position and that the Scoring Shaft (15) is pushed to its rearmost position.
4. Move the Fulcrum Plate (40) until the index mark is in line with a) pos. 3 or b) pos. 4 on the stainless steel deck, depending on whether the knives are to be made with medium or with small knife angles. 8 mm glass strips are preferably broken with the index mark at position 3 to provide a stronger breaking force.
5. Guide the glass strip (rough score upwards) along the Guide Plate until the left-hand end is in line with pos. 1 on the deck.

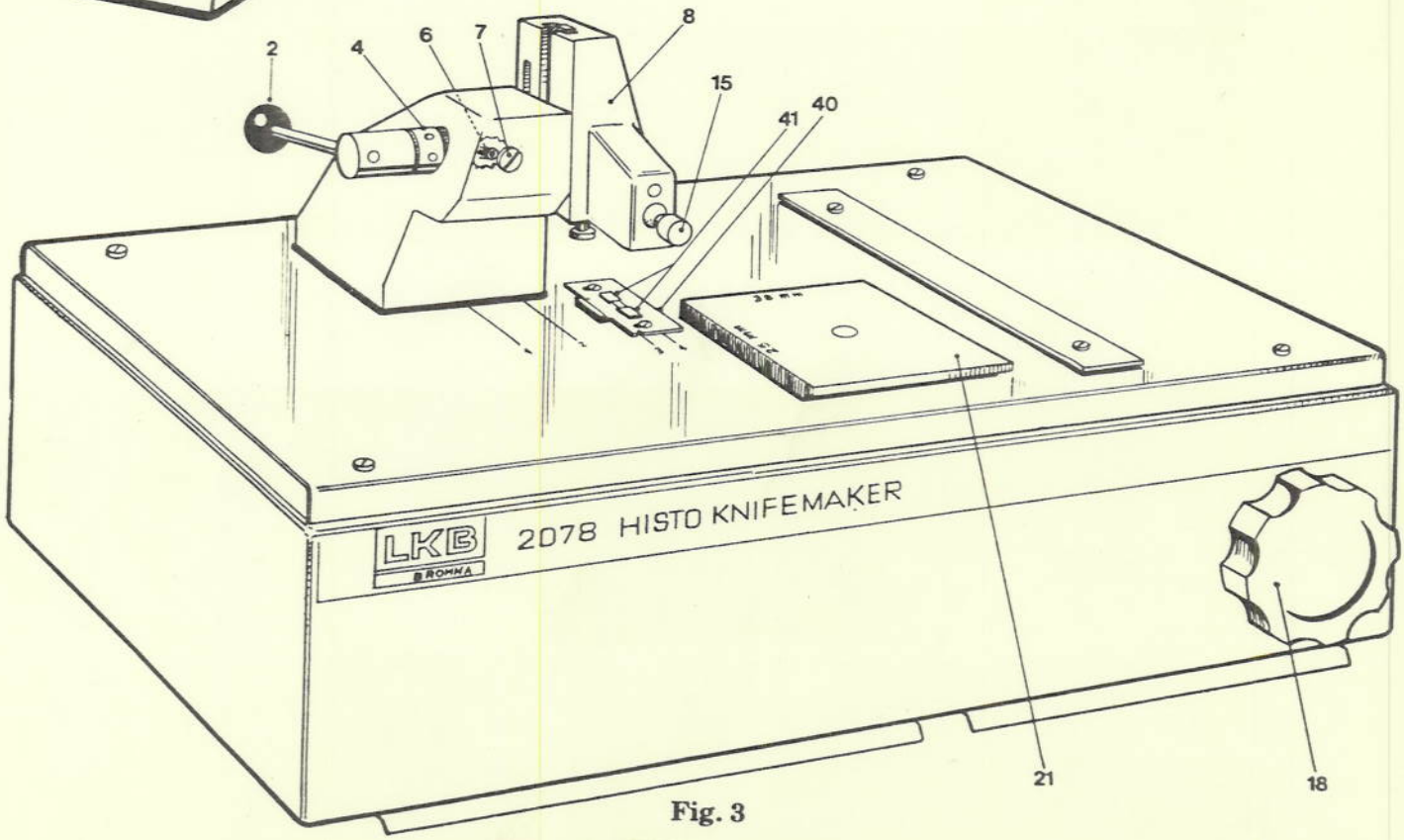

Fig. 3

6. Clamp the glass strip firmly by lowering and locking the Clamping Head with the aid of the lever. Do not use undue force.

Note: Remove your hands from the strip when the upper studs touch the glass.

7. Pull the Scoring Shaft (15) out until it meets the stop.
8. Release the Clamping Head slightly by swinging the lever into the vertical position. Move the Glass strip 1–6 mm (see diagram for typical knife profiles) towards the left from pos. 1 on the deck. Increasing the distance gives a smaller knife angle when the breaking force is sufficient.
   Clamp the strip.
9. Turn the Breaking Knob clockwise in one smooth movement until the break occurs, then turn counter-clockwise until it meets the stop.
10. Release the Clamping Head and leave it in its upper position. Push back the Scoring Shaft until it meets the stop.
11. Pick up the left-hand part of the broken strip; this forms the Ralph type knife. The edge is formed where the break meets the underside of the glass. Be careful not to touch the knife edge when the knife is moved. If more knives are to be made, repeat the sequence from point 5.

    The height of the knives is approximately 50 mm. In order to be used with the LKB adapters for sledge microtomes and rotary microtomes, the knives must be cut down to a height of approx. 25 mm.

    Note: It is not recommended to make knives directly with a height of 25 mm, since stress forces on the glass will produce an uneven edge.

    Proceed as follows:
12. Remove the glass strip from the Guide Plate.
13. If the Fulcrum Plate index mark is not in line with pos. 3 on the deck, move it to this position.
14. Place the knife with its edge uppermost and pointing to the left and with the 50 mm side along the Guide Plate, and move it until the edge is in line with pos. 2 on the deck.
15. Clamp the glass, score and break.
16. Release the Clamping Head and leave it in its upper position. Push back the scoring shaft.

IV Some hints concerning parameters influencing the shape of the Ralph knife

A.

Fulcrum index mark setting	Typical knife profiles, depending on the distance of the end of the glass strip to the left of position 1 on the deck.	
Pos. No. 3	Approx. 2 mm from No. 1 	Approx. 5 mm from No. 1 
Pos. No. 4	Approx. 2 mm from No. 1 	Approx. 6 mm from No. 1 

B. Settings of the Fulcrum index mark between positions 3 and 4 are also possible, and give intermediate knife angles.

Breaking forces may also be changed by moving the left-hand upper stud 10 to its inner position. See Figure 2. This has also a decreasing effect on the knife angle and suits soft and thin glass strips. Note: the position of stud *10 a must not* be altered.

C. To move stud 10 from one setting to another, proceed as follows:

Remove the Clamping Head by lifting it straight up (see Figure 1). Note the 45° position of lever 2.

Use the 6 mm wrench, supplied, to loosen the stud which is to be moved to the desired position. Make sure that the washer under the stud is kept in place.

Replace the Clamping Head 8 (see Figure 1). Note that the position of lever 2 should also be about 45° from the vertical when replacing the Clamping Head on Bracket 5.

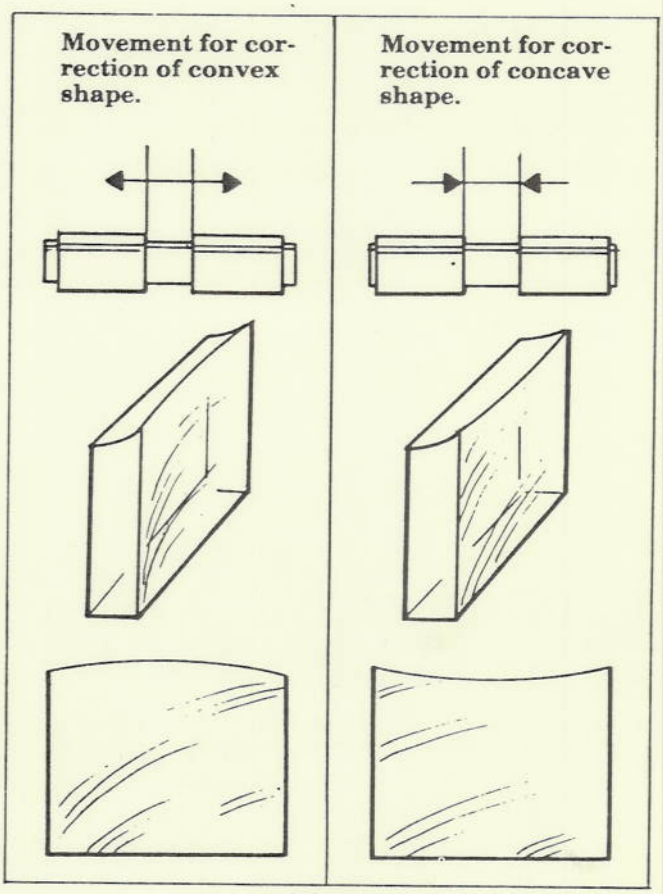

Fig. 4

D. See Figure 3. If the shapes of the knife edges become uneven after a while, replace the breaking plates (41) by pulling up the used ones and gently pressing down a pair of new ones. By moving the plates away from each other, a convex edge can be straightened. If the edge is too concave, the plates are moved closer to each other. See Figure 4. Check that the covering rubber seal is properly seated.

Note: A slight deviation from a straight edge has no negative influence on the cutting properties.

E. Do not use a heavier scoring-pressure than necessary. The break should occur within the first 2/3 of the turning movement of the Breaking Knob. For setting of scoring pressure, see under Servicing.

Servicing

A. Adjustment of Scoring Pressure (see Figure 2).

If the score in the glass becomes too deep or too faint, the pressure on the cutter wheel must be adjusted as follows:

1. Remove the Clamping Head (8) as follows:
   a) Set the lever (2) at an angle of about 45°, as shown in Figure 1.
   b) Remove the Clamping Head and place it upside down on a table.

2. Insert Allen wrench 39 into screw 33, and adjust the spring pressure as follows:

   a) If the scoring pressure is too great, turn the wrench counter-clockwise, for example, one turn at a time.

   b) If the scoring pressure is too small, turn the wrench clockwise, one turn at a time.
3. Press the shaft (3) (see Figure 1) to the right with your left hand and at the same time push Clamping Head (8) down into the bracket (5) with your right hand.
4. Make a test scoring.
5. If the score is still not of the correct depth, repeat the procedure with a new adjustment of scoring pressure.

B. Replacement of Cutter Wheel

1. Remove the Clamping Head (8). (See step 1 in A).
2. Pull the scoring shaft (15) out about 40 mm.
3. Hold the Clamping Head as shown in Figure 2. Press down the holder (32) of the cutter wheel with your thumb and remove the locking pin (36). (If it is difficult to press down the holder (32), loosen screw 33 by turning it counter-clockwise.)
4. Place the Clamping Head (8) on a table and push out the shaft of the cutter wheel, for example, with a paper clip, and remove the wheel (34).
5. Insert a new cutter wheel.
6. Replace the pin (36).
7. Replace the Clamping Head (8): see step 3 in A.

C. Adjustment of Locking Lever Position (see Figure 3)

Loosen set screw (6) behind cover screw (7). Hold lever (2) horizontally with the black knob directed towards you. Turn sleeve (4) backwards to its stop. Tighten the set screw securely. Replace screw (7).

Ordering information

LKB Cat. No.	Description
7803A	Dust Cover
7894-01	Scoring Wheel with shaft (pkt. of 3)
2078-025	Histo Glass Strips, 25 x 6 x 400 mm (pkt. of 30)
2078-038	Histo Glass Strips, 38 x 6 x 400 mm (pkt. of 22)
2078-040	Breaking Plates, (pkt. of 10)
2078-050	Histo Knife Adapters for Microtomes using D profile knives with side mounted specimens, length 160 mm (pkt. of 2 with one clip and one shear key)
2078-051	Histo Knife Adapters for Microtomes using D profile knives with center mounted specimens, length 126 mm (pkt. of 2 with one clip and one shear key)
2078-052	Histo Knife Adapters for Microtomes using D profile knives with center mounted specimens, length 240 mm (pkt. of 2 with one clip and one shear key)
2078-053	Histo Knife Adapters for Microtomes using D profile knives with center mounted specimens, length 170 mm (pkt. of 2 with one clip and one shear key)
2078-054	Histo Knife Adapters, T-shaped, for Microtomes with knifeholders for standard triangular glass knives (pkt. of 2)
11808	Brush for removing glass chips (pkt. of 5)
2078-060	Histo Knife Tray, holds up to 30 ready knives and fits into 8820 plastic box.
8820	Plastic Box, for safe protection of knives held by the Histo Knife Tray.
2208-010	MultiPlate, for mounting knives on holders and for melting wax. For 110 V, 50-60 Hz, 25 W
2208-020	MultiPlate. For 220 V, 50-60 Hz, 25 W
8890-20	Wax for mounting Histo Glass Knives

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