Rotary Microtome User Manual

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Profitable Suggestions:

- The user should read this user manual carefully before installation and operating the machine.
- Unit must ship upright. If this unit was shipped lying down or stored lying down then it MUST stand upright for 36 hours before use for all oils to lubricate the compressor.
- Holding the fore and end trough of the back when moving it and don't hold the other parts like hand wheel handle.
- Being placed on the experiment stable working table to prevent it receiving quakes from the ground.
- Blade is sharp, beware when you change it.
- Do not place blade anywhere with the cutting edge facing upwards.
- Before changing specimens always lock the hand wheel and cover the knife edge with the knife guard.
- Do not put instrument under extreme temperature and high air humidity environment. Failure to follow this will cause instrument severe damage.
- Please keep instrument far away from fire.
- In case of malfunction, contact our company. Don't try to solve it by your own risk.

1. Introduction

1.1 General introduction

Rotary paraffin microtome is the national regulated first class medical equipment. It is a device used for human and propagation tissues pathological section analysis. It is used to cut paraffin embedding specimens, thin section mounted specimens. It can be widely used for pathological diagnosis analysis and research in hospitals, medical colleges, legal medical experts and propagation institutes.

1.2 The instrument mainly consists of the following:

Box shape specimen clamp

Universal orientation system

Movable knife holder and locking device

Movable waste tray

Microtome hand wheel and locking device

Coarse driving device

Trimming device

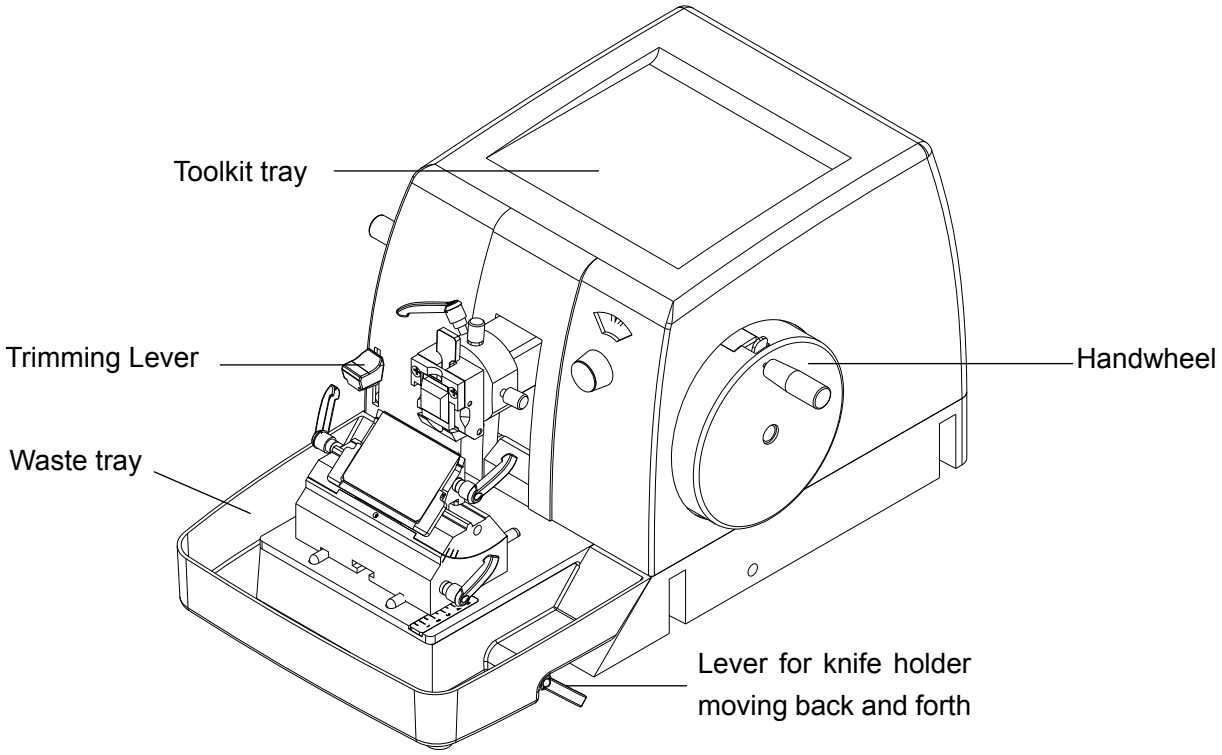
Window for displaying section thickness

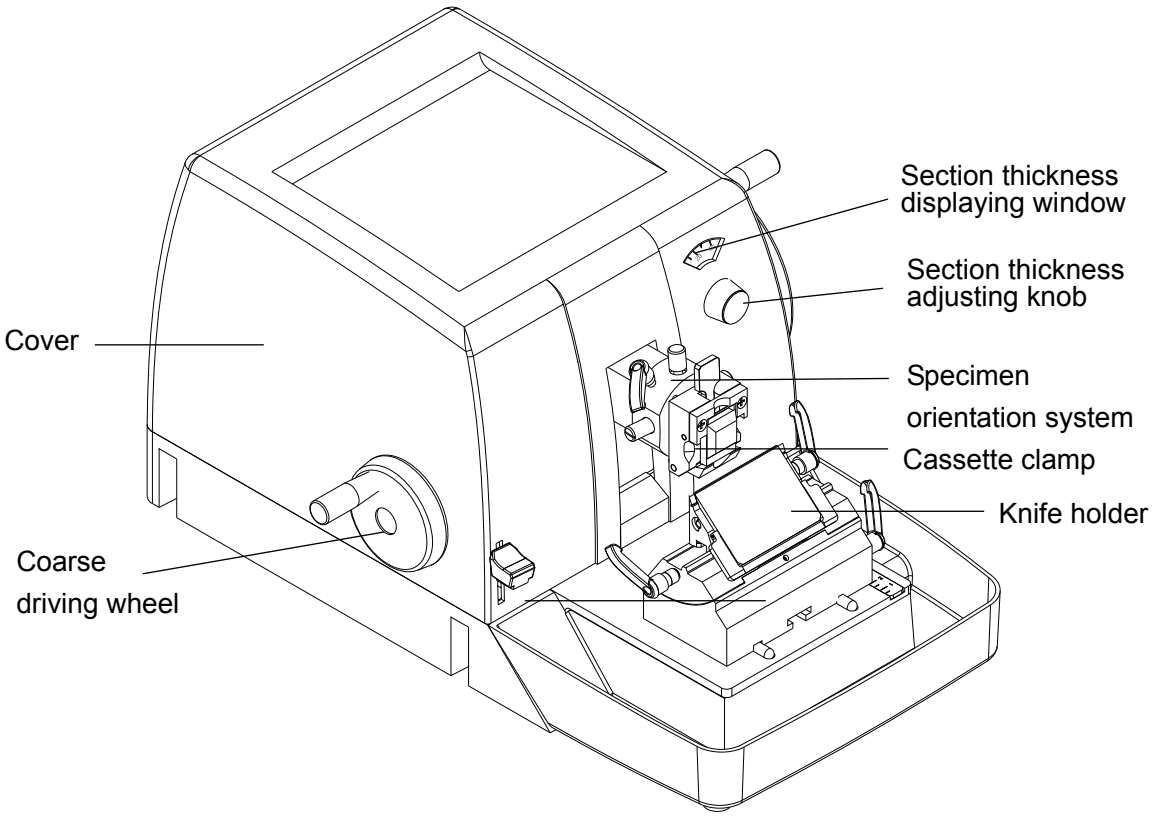
Adjustable knob for setting section thickness

Seat base and driving mechanism

Cover

1.3 General overview





2. Scope of Application

Used to cut paraffin embedded specimen and make thin section mounted specimens

3. Technical Parameter

3.1 Operating temperature：+10 °C to +35°C

3.2 Operating humidity：< 80%

3.3 Section thickness：1～60μm adjustable, Setting value:1μm～10μm，increment 1μm

10μm～20μm, increment 2μm

20μm～60μm，increment 5μm

Error tolerance: ±20%

3.4 Trimming thickness: 30μm

3.5Specimen stroke: horizontal 28mm; vertical 70mm

3.6Dimension: (L × W × H) 620×410×310（mm）

3.7Total weight：About 35kg

3.8 Working noise: less than 60dB (A)

4. Working Conditions

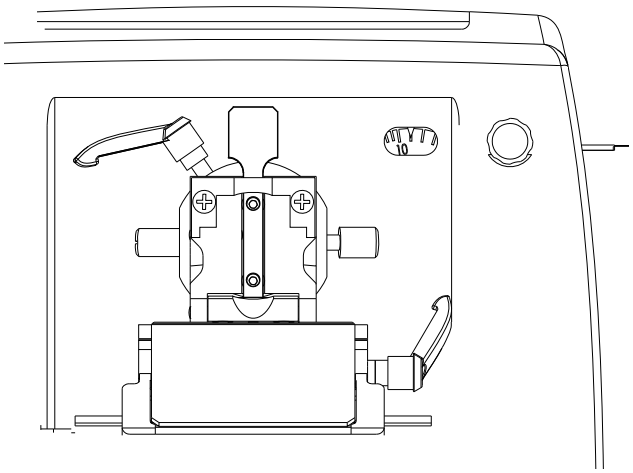
4.1 This instrument is a movable desk top type which can be placed on the experiment stable working table to prevent it receiving quakes from the ground, and don't install other vibrating equipments round it.

4.2 keep distance between machine and wall and other things when placing it, and leave enough places for handwheel rotation.

4.3 The instrument should be used at ambient temperature +10℃~+40℃.

4.4 Environmental relative humidity shall not be more than 80%.

5. Operation



Section thickness displaying window and Section thickness adjusting knob

5.1 Section thickness setting

Section thickness is set by turning adjusting knob that on the right of microtome. There are scales on the dial indicating thickness. The thickness is the pointer indicating while turning the adjusting knob.

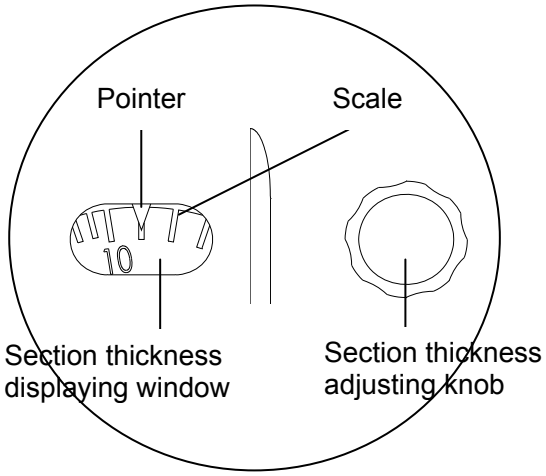
Section thickness range：1～60μm，

Selectable section thickness:

1μm～10μm，increment 1μm

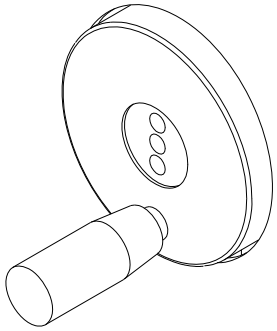
10μm～20μm, increment 2μm

20μm～60μm，increment 5μm



5.2 Sectioning

Turning handwheel one circle to slice one piece of section. The section thickness is the set thickness displaying in the window. When specimen head is over distance, the specimen is no longer moving forward turning the handwheel.

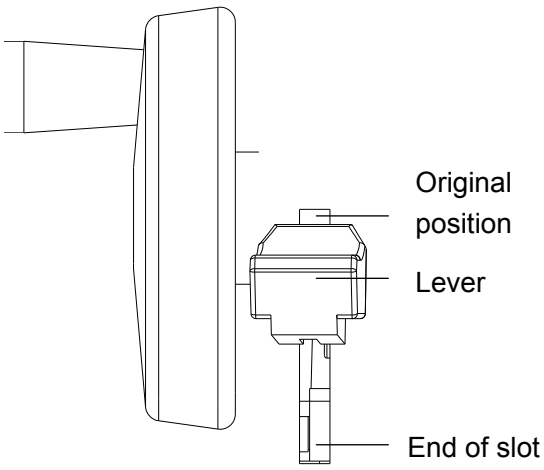


Coarse driving wheel

5.3 Fast moving back and forth

Coarse driving wheel is on the left of machine. To select suitable section position, turning the small handwheel to make the specimen back and forth.

Clockwise turning the handwheel, the specimen holder moves forward(close to knife holder);on the contrast, counterclockwise it, the specimen holder moves back(keep away from the knife holder). When moving to upper or back end position, handwheel is rotatable, but it becomes heavy and specimen does not move any more.

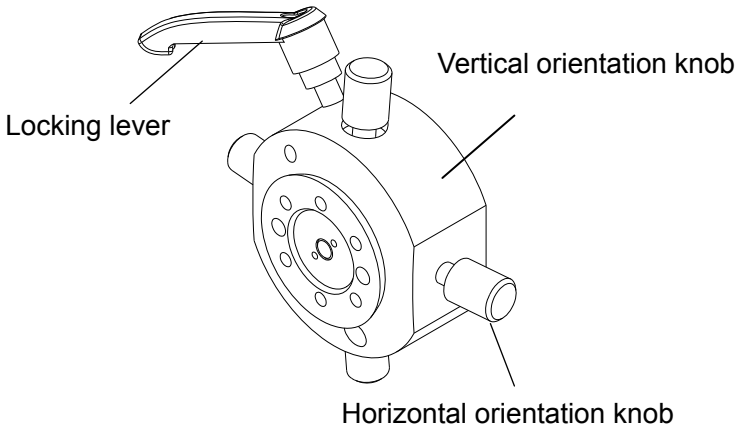


5.4 Trimming

LS-2045bB is fitted with a mechanical trimming function.

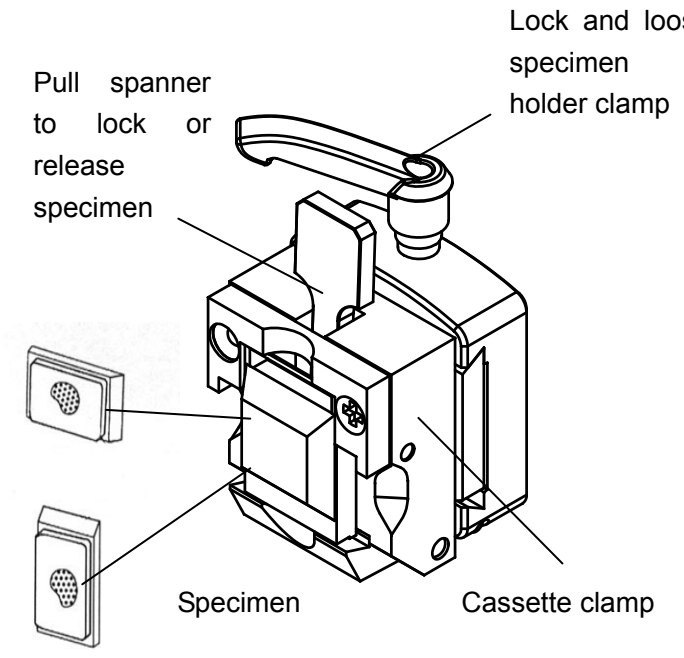
For activating the trimming function, press the lever downwards to the end of slot, then rotate handwheel. Trimming thickness is 50μm. Release the lever, it automatically springs back to its original position. The trimming function is deactivated.

5.4 Parts adjustment



5.4.1Specimen orientation system

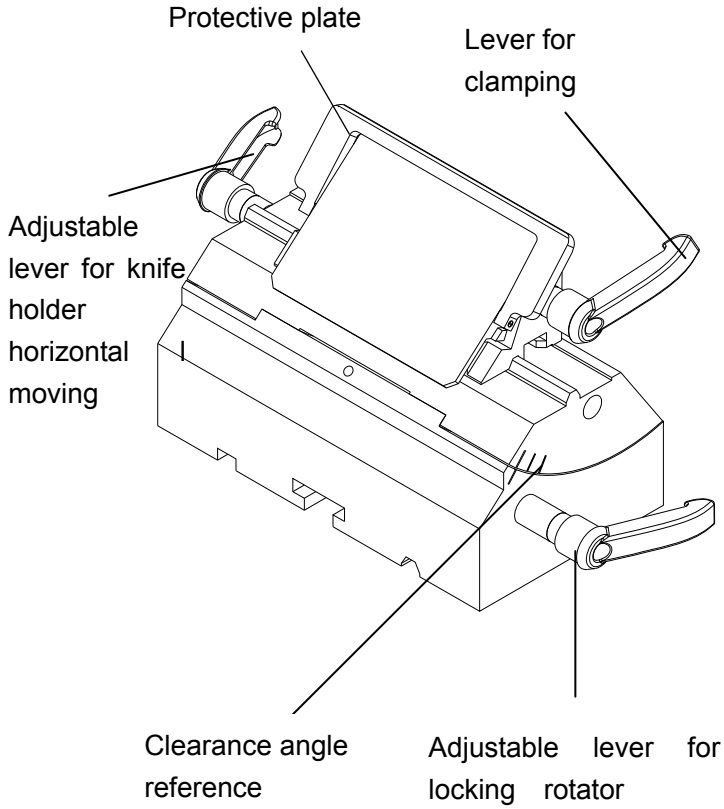
- Turning the lock lever to set the specimen holder to the adjustable release condition and section lock status.
- Turning the two orientation knobs under release condition make specimen holder clamp plane defluxion by pass horizontal axis and vertical axis for ensuring required tangent plane location to decide the required plane cutting location
- Turning the locking lever to lock and loose specimen holder clamp



5.4.4 Cassette clamp

- Rotating specimen holder clamp may lock or loose the specimen holder clamp.
- Turning the spanner on the specimen clamp can make the jaw in the state of braced and locked.
- The specimen can be put in or take off in the state of braced.
- Specimen box may be placed horizontally or vertically.

5.4.2 Knife holder

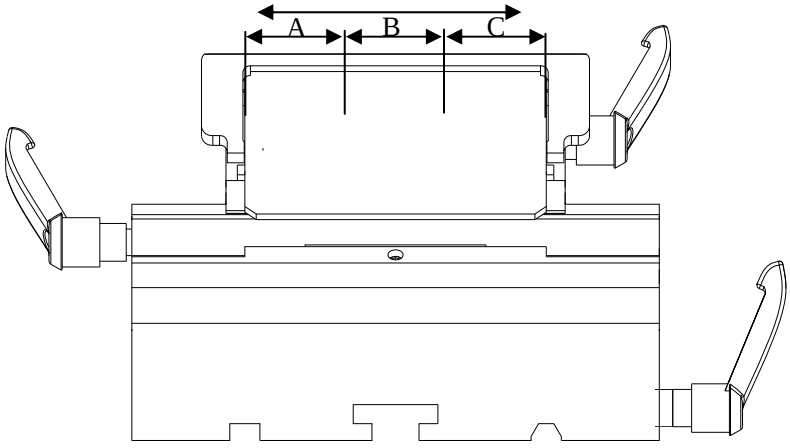


- Turning the adjustable lever under knife holder to release and lock knife holder base.
- In release conditions you can make the knife holder base do the back and forth movement by hand to choose latched position needed. There is a scale under knife holder for reference by location.
- Release the adjustable lever on the right side of the knife holder to release and lock the rotator of the knife holder.
- In release condition you can move the rotator by hand to choose locked cutting angle needed. There is a scale on the right side for reference by location.

- Turn adjustable lever on the rotator to release and lock knife clamp.
- In release condition you can make the knife clamp do the left-and-right movement by hand to choose latched position needed.
- Turn adjustable lever on the knife clamp to release and lock knife flat.
- You can put in or take off the knife in release conditions. Take off the knife after finish the work.
- The protective plate shall be on the installed position when the knife is on the knife clamp.

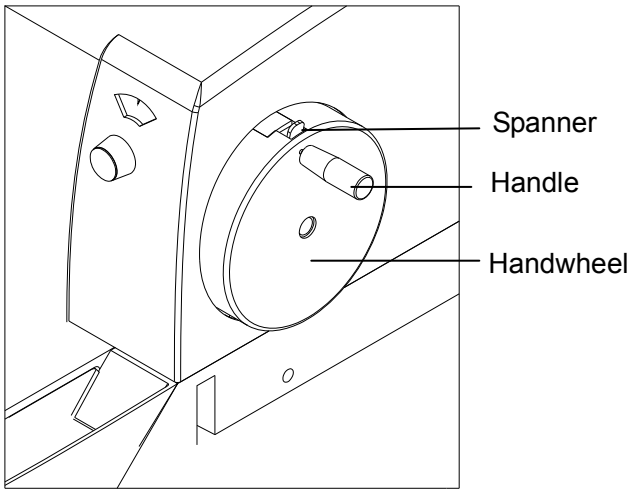
Beware of blade when adjusting the knife holder position. Always close the blade with protective plate when it is not using.

Knife holder moves from left to right



Left-and-right moving function makes disposable blade more efficient.

Operator separates one piece of blade into A, B and C three parts to slice. This function reduces material costs.



5.4.3Handwheel

- Hand wheel can be released or locked status.
- Hand wheel can be locked at a specific position when the spanner on the hand wheel is pushed to left..
- When handwheel is in the release position, evenly rotate handle to slice section.

Handwheel locking lever is one of the safe protection features of microtome. When operator stops using, please lock handwheel to avoid unnecessary injury.

6. **Normal Troubles Solving Methods**

There are normal problems in the following table which are likely to happen when the instrument is used. Besides, there are some possible causes that lead to these problems happened and solving methods.

Trouble	Reason	Solving Methods
6.1 Possible phenomena		
1. The section is uneven. The thin and thick section is alternate, even if sometimes it doesn't cutaway.	● The knife centre gripping is improper. ● Knife is dull ● Pressure plate is broken or adjustment isn't right. ● The cutting angle of the knife is too less.	● fasten knife again ● Move the knife holder lateral or stick in new knife. ● Change new holder plate, or use new knife holder ● Readjust holder plate ● Increase the cutting angle gradually until find the optimum
2. The section is congestion and compressive. The sections congestion. There is the phenomenon of crease and nip.	● Knife dull ● Specimen temperature is high ● Cutting speed so fast.	● Use the other part of the knife or a new one. ● Make the specimen cool before cutting. ● Reduce the cutting speed.
3. There is fringe in the section.	● On the pressure plate is filling up paraffin on the back of the knife holder.	● Clear up this regional paraffin.
4. There is noise when cutting. The knife will shake and sound when cutting some hard specimen. There is pull or slightly frictional make on the knife.	● Cutting speed too fast. ● The cutting angle is too big. ● Clip of specimen or knife not fixed.	● Turn hand wheel with a rather slow speed. ● Decrease the cutting angle gradually until find the optimum one. ● Check all the screwed and jaw connection in the specimen rest and knife holder system. If necessary, fixture the control rod and screw.
6.2 Instrument failure		

1. No section is cut when turn the hand wheel.	● The specimen has reached to the extreme position.	● Press “back” key to make the specimen backward and so the knife holder.
2. Knife service time is short	● The power for section is too strong.	● Adjustment the cutting speed or the section thickness in the process of cutting. Choose smaller section thickness or slow down speed of turning hand wheel.

7. Cleaning and Maintenance.

7.1 Cleaning up the instruments

7.1.1 Conduct the following steps before cleaning each time:

- Turn up the specimen grip to the top and lock the hand wheel.
- Release the specimen grip and pull it out.
- Pick off the knife from the knife holder and put it back to the knife box.
- Dismount the knife holder and its seat to clean up.
- Take down the specimen from the specimen nip. Clear away the section waste with dry brush.
- Take down the specimen grip to clear up separately.

7.1.2 Instruments and external surface:

If necessary, the external painted surface can be cleaned with light-duty commercial housework cleaner or suds. And then use wet cloth rub it until dry.
You may use the substitute of xylene, paraffin oil, paraffin scavenger to erase residual.
The instruments must be dry when use again.

7.1.3 Knife holder

Please according to following steps to clean up the knife holder if it had been dismounted.

- Downwardly turn over the cutting edge cover sheet.
- Turn the eccentric rod handle in the lateral of the body of revolution and draw it out from sideward.
- Push the knife clamp back which have knife clip and shift it out from the rotary unit.
- Turn the eccentric rod handle in the lateral of the knife clap and draw it out from sideward.
- Dismount the knife clamp.

- Clean up all parts of the knife holder.

Don’t use xylene or alcoholic liquid (e.g.: glass cleaner) when clean up paraffin.

- Make the knife holder dry and assemble it together.
- Apply to thin layer of lubrication after clean up the parts which had been taken off.
- When fix the knife clip, make sure that its upper part is parallel with the back edge of the knife clamp seat.

7.1.4 Cassette clamp

- Dismount the box shaped specimen grip to clear away the residual paraffin.
- Don’t use xylene or alcoholic liquid to clean up. Use the substitute of xylene or paraffin scavenger.
- You can put the box shaped specimen grip into oven to heat it to 65 degree until lipid paraffin bleeding off.
- Wipe off paraffin with dry cloth.
- Apply oil to the axis grasping joystick after using oven heating method.

7.2 Lubricate instruments.

Do oil lubrication for the following parts monthly. (1~2 drop is well enough)

7.2.1 Instruments and specimen holder

- Grip draw in the clamp.
- Lock in iron at the “T” knife clap back of the microtome bedplate.
- The knife holder slide way on the microtome bedplate.

7.2.2 Knife holder

- Lock in iron at the “T” body of the rotary units on the knife clamp seat.
- The knife control grip is shift to the eccentric rod handle.
- The iron locking head on the knife clamp of the ”T” body of rotary unit and the knife holder with slide way.
- The grasping joystick of the knife.

7.2.3 Cassette clamp

- The bearing of the grasping joystick.

8. Other special notices

- Must grasp the specimen before positioning the knife. During the operation locking hand wheel and cover the knife edge with its cover sheet.
- Be most careful when you take the section knife. It is possible to lead to bad hurt because of the sharp cutting edge
- You should turn the hand wheel with the same speed during the cutting process. The hand wheel turning speed must suit with the hardness of the specimen. Harder specimen use slow speed.
- Locking hand wheel and covering the knife edge with its cover sheet when changing specimen piece.
- The instrument should be positioned on the experiment work table level and stable. Preventing it from quake from the ground, and don't put other equipments which may produce vibration near the instrument.
- Holding the fore and end trough of the back when moving it and don't hold the other parts like hand wheel handle.
- Periodically cleaning the instrument.
- Locking the hand wheel before cleaning.
- Don't use acetone or xylene liquid to clean up the instrument.
- Make sure that no paraffin comes into the inside of machine during the cleaning.
- Please follow the safety warnings of the manufacture when using cleaning solvent.
- Put the hand wheel on the locking position when turn down the instrument.