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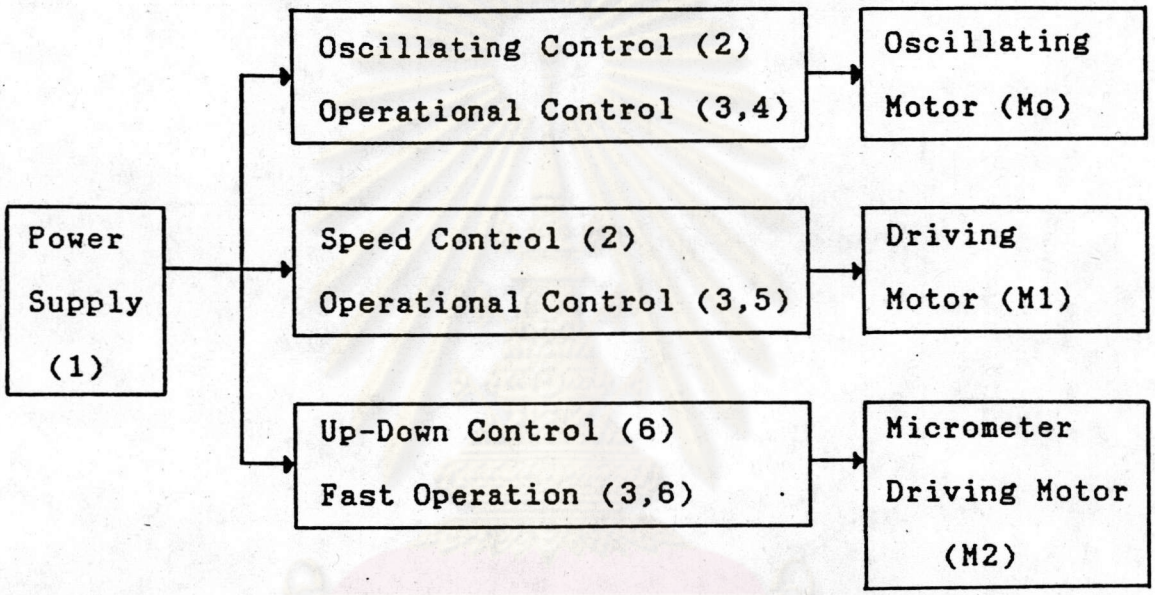
APPENDIX A

WIRING DIAGRAM OF OSCILLOTOME

1. Block diagram of Oscillotome



2. DC Power Supply Circuit.

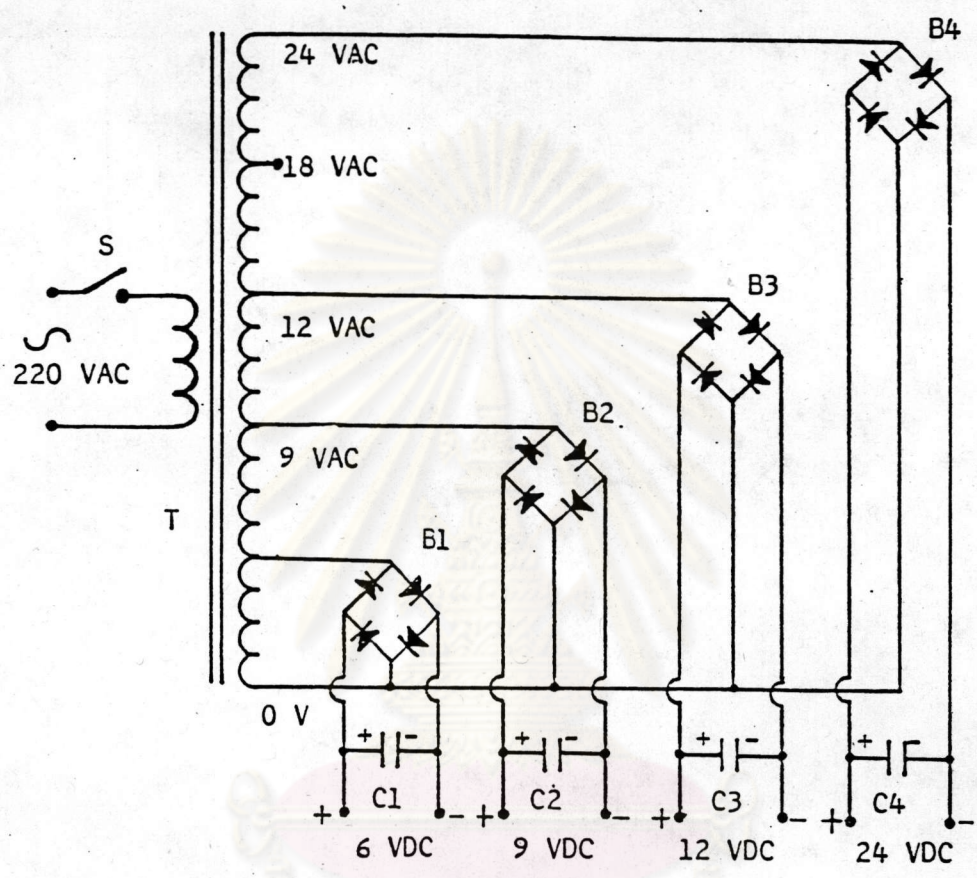


Fig. 23. Circuit diagram of main DC power supply consists of a step-down transformer and rectifier circuit. S = a power switch; T = a transformer; VAC = Volt AC; VDC = Volt DC; B_1-B_4 = bridge rectify circuits consisted of four diodes (1N4001x4), electrolytic capacitors (C1 = 1200 uF, 10 V; C2 = 100 uF, 16 V; C3 = 1000 uF, 25 V; C4 = 100 uF, 35 V).

3. DC Regulated Circuit.

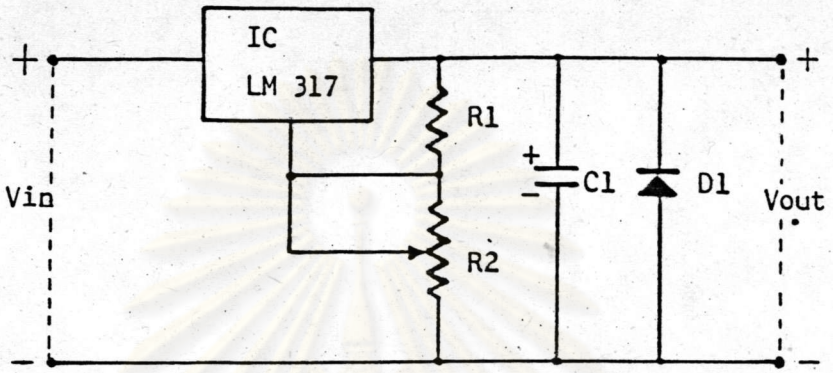


Fig. 24. DC regulated circuit provides a controllable voltage (Vout) for supplying to the oscillating motor Mo (Vin = 9 VDC; Vout = 0-9 VDC) and the driving motor M1 (Vin = 12 VDC; Vout = 0-12 VDC). (Vin = input DC voltage; R1 = 390 Ohm; C1 = 1 uF, 50 V; D1 = 1N4001; R2 = variable 5 kOhm, type B).

4. Control Circuit of Relay 1, 2 and 3 (Ry1, Ry2 and Ry3).

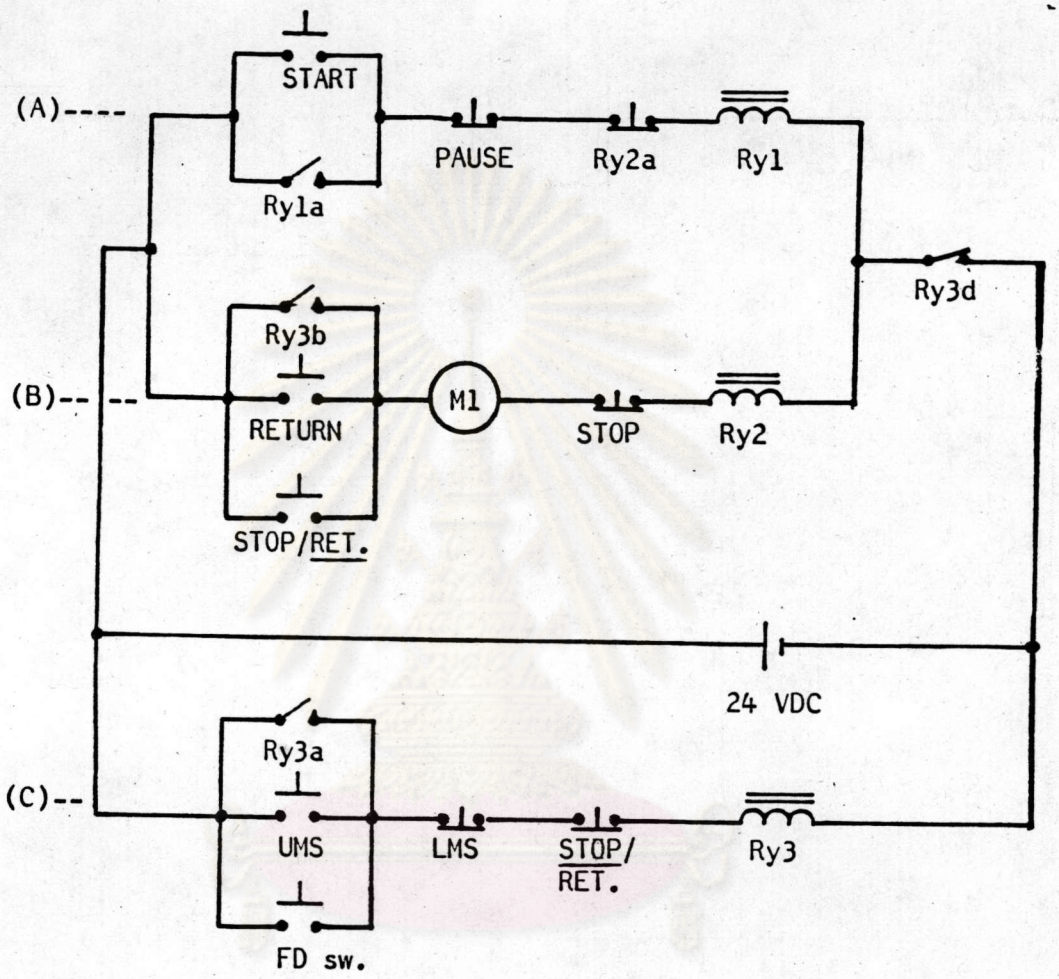


Fig. 25. Control circuit of three relay switches consists of 3 parts; part A for Ry1, part B for Ry2 and part B for Ry3.

5. Control Circuit of Oscillating Motor (Mo).

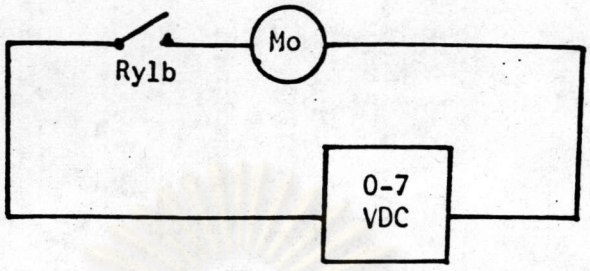


Fig. 26. Control circuit of the oscillating motor Mo. Oscillation of the motor Mo is controlled by the NO switch Ry1b and supplying voltage (0-7 VDC).

6. Control Circuit of Driving Motor (M1).

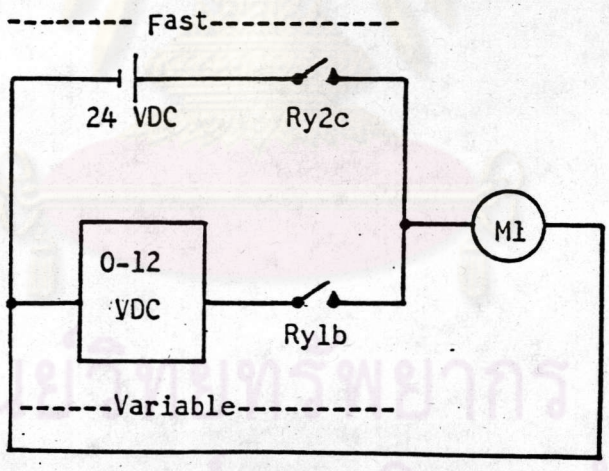


Fig. 27. Control circuit of the driving motor M1. The motor M1 is supplied alternately between two different voltage, 24 VDC and 0-7 VDC according to the timing of which relay switch (Ry1 or Ry2) is working.

7. Control Circuit of Micrometer Driving Motor (M2).

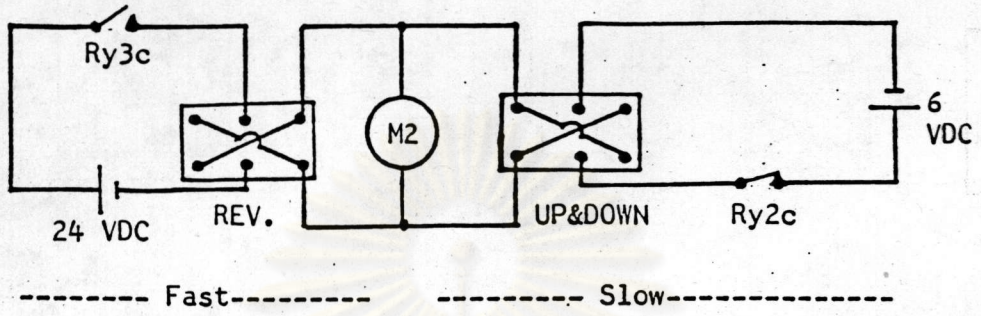


Fig. 28. Control circuit of the micrometer driving motor M2. This motor is also supplied alternately between 6 VDC and 24 VDC. These voltages can be reversed their polarity with using the ON-OFF-ON tiltable switches 'REV.' and 'UP&DOWN'.

APPENDIX B

ABBREVIATIONS AND SYMBOLS

1. Mechanical Relay Switches.

Ry1, Ry2, Ry3 = mechanical relay switches (Ry) 1, 2 and 3

 = electro-magnet

 = normally closed (NC) switch

 = normally opened (NO) switch

2. Microswitches.

START = an NO microswitch of the 'START' switch.

RETURN = an NO microswitch of the 'RETURN' switch.

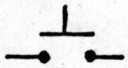
STOP/RET = a twin microswitch composed of NO microswitch (RET) used to stop oscillation and bring the oscillator carriage back to the starting position, and NC microswitch (STOP) used to stop fast motion of the tissue stage.

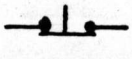
STOP = an NC microswitch for termination of the moving carriage.

PAUSE = an NC microswitch of the 'PAUSE' switch.

UMS = an NO microswitch used for limiting upper level of the micro-position.

LMS = an NO microswitch for setting lower limit of movement of micrometer.

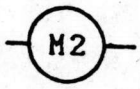
 = a symbol of the NO microswitch

 = a symbol of the NC microswitch

3. DC Motors.

= a oscillating motor.

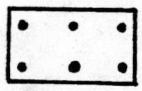
= a driving motor of the oscillator moving carriage (MC).



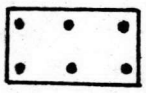
= a micrometer driving motor.

4. Tiltable Switches.

UP&DOWN = a two way selector switch (ON-OFF-ON) used for fine control of the direction of the tissue stage.



REV. = 'REVERSE', an one-way tiltable switch (ON-ON) used for control fast downward motion of tissue stage.



VITA

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