

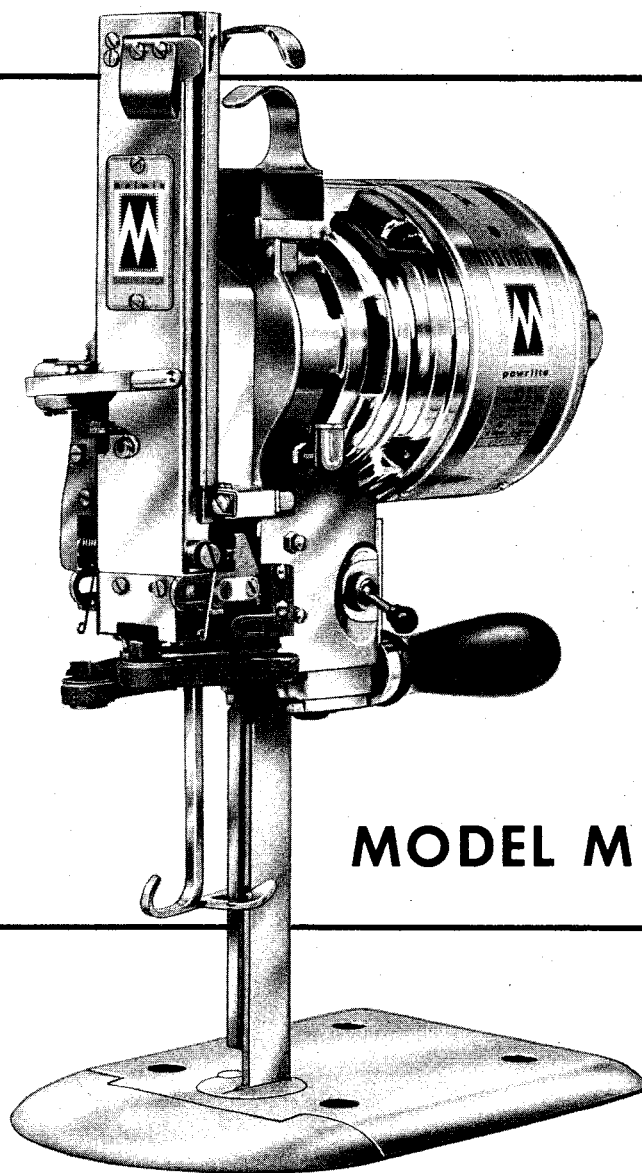
# **MAIMIN**®

## **STRAIGHT KNIFE CUTTING MACHINE**

*with*

### **"FLEXI-BAND" SHARPENER**

Instructions  
and  
Parts  
List



**MODEL M**

Edition 2

H. MAIMIN CO., INC., 575 EIGHTH AVENUE, NEW YORK, N.Y. 10018 U.S.A.

# TABLE OF CONTENTS

## SECTION I - DESCRIPTION

	PAGE
1-1 General .....	2
1-2 "Flexi-Bands" Available .....	2
1-3 Blades Available .....	2

## SECTION II - OPERATION

2-1 To Start .....	3
2-2 To Cut .....	3
2-3 To Sharpen Blade .....	3
2-4 To Adjust Bevel Width on Blade .....	3

## SECTION III - CARE & MAINTENANCE

3-1 Maintenance Schedule .....	3
3-2 To Oil .....	3
3-3 To Change "Flexi-Bands" .....	3
3-4 To Change Blade .....	4
3-5 To Clean Inserts .....	4
3-6 To Clean Commutator .....	4
3-7 To Clean Sharpener .....	4
3-8 To Clean Motor .....	4
3-9 To Clean Rollers .....	4

## SECTION IV - TROUBLE-SHOOTING GUIDE

4-1 Sharpener Trouble-Shooting .....	5
4-2 Machine Trouble-Shooting .....	6

## SECTION V - ADJUSTMENTS & REPAIRS

5-1 Sharpener .....	7
a) Guide Spring Adjustment .....	7
b) Blade Safety Arm Adjustment .....	7
c) Pulley Brake Adjustment .....	7
d) Presserfoot Leg Adjustment .....	7
e) Pulley Replacement .....	8
f) Band Carrier Adjustment .....	8
g) Sharpener Removal .....	8
h) Sharpener Disassembly .....	8
i) Slide Disassembly .....	8
j) Frame Disassembly .....	8
k) Sharpener Assembly .....	9
5-2 Machine .....	9
a) To Change Carbon Brushes .....	9
b) To Adjust Crosshead & Gibbs .....	9
c) To Set Position of Standard .....	10
d) To Replace Inserts .....	10
e) To Remove Crank .....	10
f) To Replace Motor Bearings .....	10
g) To Replace Crank Pin Bearing .....	11
h) To Reassemble Motor .....	11

## SECTION VI - PARTS LIST

Plate 1 Sharpener Slide Assembly .....	12-13
Plate 2 Sharpener Frame Assembly .....	14-15
Plate 3 Machine Assembly .....	16-17

# SECTION I

## DESCRIPTION

### 1-1. GENERAL

Your new Maimin "POWR" straight knife machine is delivered ready for operation. It is merely necessary to connect it to an electrical outlet of the correct voltage, oil it, and then begin cutting. The straight knife machine can be used for cutting various types of materials from a few ply to the full height of the standard. However, for best results, it is recommended that the minimum height of the lay be no lower than the bottom of the cutting blade at its highest position. The Presserfoot Leg (Key No. M21) acts as a protective guard for the operator so that it should be down at all times. The Presserfoot should lie lightly on top of the lay when cutting in order to prevent the material from vibrating.

### 1-2. "FLEXI-BANDS" AVAILABLE

There are three different grits of "Flexi-Bands" (Key No. M70) available for use on this sharpener:

Coarse - For hard or coarse materials

Medium - For fine woolens, synthetics, and cottons

Fine - For sheer fabrics and very soft materials

"Flexi-Bands" are sold in boxes of 100.

### 1-3. BLADES AVAILABLE

The cutting blades (M234) come in three grades and also in several different shapes for cutting unusual or difficult materials. The three grades available are:

ZZT(K) - High Speed Steel.

Most popular blade as it wears well, retaining its cutting edge for a long time.

BT(K) - Carbon Alloy Steel.

A quality blade less durable than the ZZT blade but less costly.

ST(K) - Special Alloy

Retains its cutting edge extremely well but is very expensive. Used only for difficult materials such as fiberglass and heavy canvas.

The various shaped blades are illustrated and their uses are described below:



Regular Blade (K) - Recommended for general purpose cutting. Available in BT, ZZT, and ST grades.



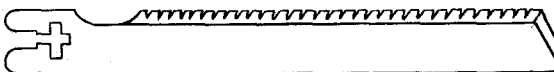
Long Blade (K) - 1/8" longer and with different shaped bottom corner than regular blades, it is used for loosely woven or very hard materials. For terry cloth, quilting, denim, etc. ZZT grade only. Also available with Teflon Coating in 6", 8", 9" sizes to reduce fusing of synthetic materials.



Slotted Blade (K) - For synthetic leather, supported fabrics, rubber-backed fabrics, and certain types of plastics. ZZT grade only.



Wave Blade - Popularly used for plastics. Also taffeta and buckram. BT and ZZT grade available.



Saw Blade (K) - Used for rubberized fabrics, canvas, crinoline. BT only.



Serrated Blade (K) - For fabrics with designs adhering to surface. BT only.

# SECTION II

## OPERATION

### 2-1. TO START

Oil Crosshead and Gibbs at Oil Cup (M258). Attach Connector to Terminal Pins (M248). Flip Switch (M259) to "on" position.

### 2-2. TO CUT

Raise Presserfoot (M21) to height of lay by pressing down on Presserfoot Trigger (M155) and lifting Presserfoot Lift (M19).

When entering the lay, lower the Presserfoot until it rides on top of the lay. Then release the Presserfoot Trigger.

When making turns, it is sometimes advisable to let the Presserfoot ride freely on top of the lay by pressing down on the Presserfoot Trigger.

When the machine is not in use, lower the Presserfoot to the Baseplate. The Presserfoot Leg acts as a safety guard for the blade.

### 2-3. TO SHARPEN BLADE

Remove machine from lay and make sure Presserfoot is down on the Baseplate.

With motor running, pull Sharpener Trigger (M120) outwards and release it. Sharpener will automatically sharpen the entire blade. Repeat if necessary.

The sharpening cycle will have to be repeated a number of times to sharpen the initial edge on a new blade. Thereafter, it will only be necessary to sharpen once or twice to renew the edge.

Do NOT press the Presserfoot Trigger when sharpening as this will loosen the Presserfoot Leg which guides the sharpener.

### 2-4. TO ADJUST BEVEL WIDTH ON BLADE

The width of the bevel on the blade can be varied by changing the angle of the "Flexi-Bands" to the blade.

Loosen both Set Screws (M13A), and turn the two Bevel Adjusting Studs (M13) to obtain desired angle of "Flex-Bands". The Studs can be turned 360 degrees, but a small turn will produce a noticeable change in bevel width. Tighten the two Set Screws.

For good cutting and trimming, the bevel width on both sides of the blade must be equal.

## SECTION III

### CARE AND MAINTENANCE

#### 3-1. MAINTENANCE SCHEDULE

Daily: Before starting motor, fill the Oil Cup (M258) half full two times daily for the first month. . . . once a day thereafter.

Weekly: Clean Sharpener (Par. 3-7)  
Clean Inserts (Par. 3-5)  
Oil Gears under Carrier Block (M29)

Monthly: Clean motor (Par. 3-9)

Semi-Annually: Check Carbon Brushes (Par. 5-2a)  
Clean Commutator on Armature (Par. 3-6)  
Adjust Crosshead and Gibbs (Par. 5-2b)  
Clean Rollers (Par. 3-9)

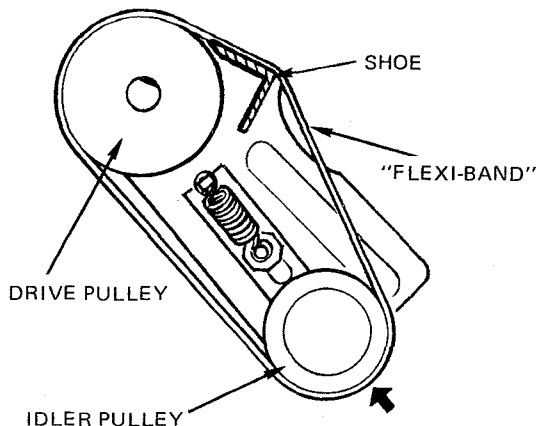
#### 3-2. TO OIL

Oil the machine daily as noted above. Be sure to use either Maimin oil or a good grade of "30 weight" oil. Do not use sewing machine oil or any other light oil as it is not designed to give the lubrication needed for the cutting machine. The machine has sealed ball bearings which require no lubrication.

#### 3-3. TO CHANGE "FLEXI-BANDS"

Place forefinger and thumb on the end of Tension Plate (M58) and hub of Band Plate (M57, M66). Squeeze together, and slide "Flexi-Band" downwards. Replace with new "Flexi-Band". The "Flexi-Band" must fit over the Drive Pulley (M64)

and the Idler Pulley (M59) and on the outside of the shoe of the Band Plate (See Illustration below).

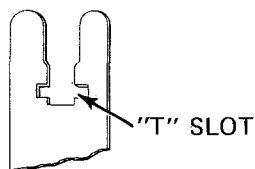


### 3-4. TO CHANGE BLADE

The blades used in the Model M machine must have a "cut-out" as illustrated below to insure straight sharpening of the cutting edge. This blade can be used in all Maimin straight knife cutting machines.



To remove the blade, lower the blade to its bottom position by turning the Knob (M220), and raise the Presserfoot Leg (M21). Unlock the Knife Bolt and Nut (M239) with the Knife Key. Slide the blade out, and clean the Inserts. Slide the new blade up through the Inserts until its "T"-shaped shoulder is firmly against the Knife Locking Bolt. Hold the lower part of the blade up and against the back of the Inserts. Lock the blade securely. Only use genuine Maimin blades with the patented "T" slot.



Always tighten the Knife Locking Bolt and Nut before running the machine to prevent damage to the Crosshead and Gibbs.

### 3-5. TO CLEAN INSERTS

The Inserts (M253) which guide the blade in the Standard must be cleaned occasionally and whenever the blade is changed. Otherwise, dirt collected in the Inserts can cause the blade to cock and not sharpen properly. Clean the Inserts by sliding the saw-tooth slot cleaner (or bottom back corner of the blade) up and down the back of the Inserts.

### 3-6. TO CLEAN COMMUTATOR (Single Phase Motor Only)

The copper Commutator on the Armature (M226) develops a black carbon ring after considerable use. This carbon ring prevents proper contact between the Carbon Brushes (M218) and the Commutator which causes arcing and prevents the motor from reaching full speed quickly. While the motor is running, touch a piece of commutator chalk or fine emery cloth lightly against the Commutator to clean off this black carbon ring.

### 3-7. TO CLEAN SHARPENER

Run the sharpener to its lowest position, turn off motor, and blow out the lint and dust with compressed air. Check the gears to see that no dirt or bits of cloth are packed in the teeth. Put a drop of oil on each of the gears underneath the Carrier Block (M29) and the gears attached to the Upper Gear Block (M166) to insure smooth running.

### 3-8. TO CLEAN MOTOR

Over a period of time, dust and lint will build up inside the motor and prevent proper cooling. With the motor running, point a stream of compressed air into the Back Housing (M222) and then into the side of the Front Housing (M213) by the fan to eject the dust and lint.

### 3-9. TO CLEAN ROLLERS

If the Rollers (M227) in the Baseplate (M255) do not roll freely, blow out the dust or dirt in the Rollers. Do not oil as it will collect dirt, causing the Rollers to bind. Use a powdered graphite for lubrication if necessary.

# SECTION IV

## TROUBLE SHOOTING GUIDE

### 4-1. SHARPENER TROUBLE-SHOOTING

1. Blade Edge Not Sharp -
  - a. Check for a worn-out Blade
  - b. Check for dirty or worn out "Flexi-Bands"
  - c. Check for weak or broken Guide Springs (Par. 5-1a)
  - d. Check for mis-alignment of the Standard and Presserfoot Leg (Par. 5-1d).
  - e. Check the Molded Pulley for excessive oil or wear (Par. 5-1e).
2. Bevel Too Wide -
  - a. Reset Bevel Adjusting Stud (Par. 2-4).
3. Bevel Too Narrow -
  - a. Reset Bevel Adjusting Stud (Par. 2-4).
  - b. Trouble shoot under #1, above.
4. One Side of Blade Not Sharpening -
  - a. Check for a weak or broken Guide Spring (Par. 5-1a).
  - b. Check that Band Carrier pivots freely (Par. 5-1f).
  - c. Check for worn Inserts (Par. 5-2d).
  - d. Check position of Blade Safety Arm (Par. 5-1b).
5. Uneven Blade Wear -
  - a. Check the Molded Pulley for excessive oil or wear (Par. 5-1e).
  - b. Presserfoot Leg loose when sharpener operating. Do not press Presserfoot Trigger when sharpening.
  - c. Check that the Presserfoot Leg is straight.
6. Blade Sharpening at an Angle -
  - a. Check for dirt in the Inserts (Par. 3-5).
  - b. Make certain that the Blade is tight against the back of the Inserts (Par. 3-4).
  - c. Check for mis-alignment of the Presserfoot Leg and the Standard (Par. 5-1d).
  - d. Check for loose Crosshead and Gibbs (Par. 5-2b).
  - e. Check for worn Presserfoot Leg Guide (M23) or weak Presserfoot Leg Guide Spring (M24).
7. Bottom of the Blade Chewed Out -
  - a. Check position of Blade Safety Arm (Par. 5-1b).
  - b. Check vertical movement of Band Carrier (Par. 5-1f).
8. Sharpener Overrunning -
  - a. Check if Trigger Stop Screw (M7) is set too low.
  - b. Check for weak or broken Pulley Brake (Par. 5-1c).
9. Sharpener Not Running Smoothly -
  - a. Check Molded Pulley for excessive oil or wear (Par. 5-1e).
  - b. Oil Gears under Carrier Block (M29) and gears on Upper Gear Block (M166).
10. Sharpener Traverses but the "Flexi-Bands" Fail to Rotate -
  - a. Check for broken teeth on Bevel Gear (M160).
  - b. Check for broken 12 tooth Gear (M115).
11. Sharpener Fails to Operate -
  - a. Make certain that the Presserfoot Leg is down completely (Par. 2-3).
  - b. Check the Molded Pulley for excessive oil or wear (Par. 5-1e).
  - c. Check for cloth jammed in the gears.
  - d. Check for broken teeth on 829, 830, or 1493 gears (M150, M149, M115).
12. Presserfoot Leg Slipping -
  - a. Check that Trigger Screw (M154) is tight.
  - b. Check for a weak or broken Presserfoot Trigger Spring (M153).
  - c. Check for worn V block (M171) on Front Plate.

d. Check that thick section of Cam Shoe, (M165) is against Presserfoot Leg (Par. 5-1k).

13. Presserfoot Leg Fails to Operate -

a. If the sharpener is not all the way up -

- (1) The motor is stopping before the sharpening cycle is completed.
- (2) The Pulley Brake (M245) and/or Trigger Stop Screw (M7) is set too high.
- (3) Oil on Pulley (M131) causes slipping (Par. 5-1e).

b. If the sharpener is all the way up and the Safety Lock Screw (M128) interferes with the movement of the Presserfoot Leg, reset the Safety Lock Screw.

14. Latch Slipping from Chain Roller -

a. Check for a worn Latch (M3) and/or Latch Spring (M2).

b. Check for a worn Chain Roller (M108).

15. Sharpener Screeching -

a. Oil the gears under the Carrier Block (M29) and on the Upper Gear Block (M166).

## 4-2. MACHINE TROUBLE-SHOOTING

1. Bottom Corner of Blade Breaks -

a. Inserts badly worn - change (Par. 5-2d).

b. If cutting hard materials, use Wide Slot Throat Plate.

c. Latch slipped off Chain Roller (Par. 4-1 [14]).

2. Motor Slow in Reaching Full Speed -

a. Check that the proper voltage is being delivered in the electrical line.

b. Single Phase:

- (1) Brushes worn (Par. 5-2a)
- (2) Commutator dirty (Par. 3-6)

c. Three Phase:

- (1) Fuse probably out on one line

(2) Ground wire incorrectly connected to machine

3. Motor Binds at One Spot -

a. Check freeness of Crosshead and Gibbs (Par. 5-2b)

b. Check alignment of Standard and Blade in Crosshead (Par. 5-2c)

c. Check for bent Standard

4. Motor Becomes Hot -

a. Check Brushes (Par. 5-2a)

b. Clean Commutator (Par. 3-6)

c. Clean the lint and dust out of motor (Par. 3-8)

d. Single phase - Back Housing incorrectly aligned with Stator (Par. 5-2h)

e. Three phase - One electric line not working

5. Motor Rotates Wrong Way -

a. Single Phase - Back Housing incorrectly aligned with Stator (Par. 5-2h)

b. Three Phase - Change any two wires in Terminal Block or Connector.

6. Motor Does Not Start -

a. Check that Connector is firmly attached to Terminal Pins (Par. 2-1)

b. Check for defective Switch (M259).

c. Check for broken Shunt Wire (M223).

7. Terminal Block and/or Connector Becomes Very Hot -

a. Inserts in Connector worn - change Connector.

b. Terminal Pins (M248) worn - change Pins.

8. Machine Does Not Roll Freely on Table

a. Clean Rollers in Roller Carriers (Par. 3-9).

b. Check condition of surface of cutting table.

c. Cushions in Roller Carriers worn causing Baseplate (M255) to drag on table - change Cushions.

## SECTION V

### ADJUSTMENTS AND REPAIRS

#### 5-1. SHARPENER

(a) Guide Spring Adjustment - The pressure of each "Flexi-Band" against the blade should be approximately equal. If a Guide Spring (M10, M15) is weak, the Band Plate (M57, M66) will not be held against the blade with sufficient force.

To increase the pressure of the Guide Spring, release the Guide Spring from the hook in the Band Carrier Guide (M17, M31). Unscrew the Spring Stud (M9) until the short end of the Guide Spring can be pulled out of its hole in the Slide (M6). Put that short end of the Spring in the next hole above, and tighten the Stud. Engage the Spring in the Band Carrier Guide.

There are two holes for each Guide Spring drilled into the Slide. If the Spring is already in the top hole and increased pressure is required, it is necessary to replace the Guide Spring. Put the short end of the new Guide Spring in the lower hole.

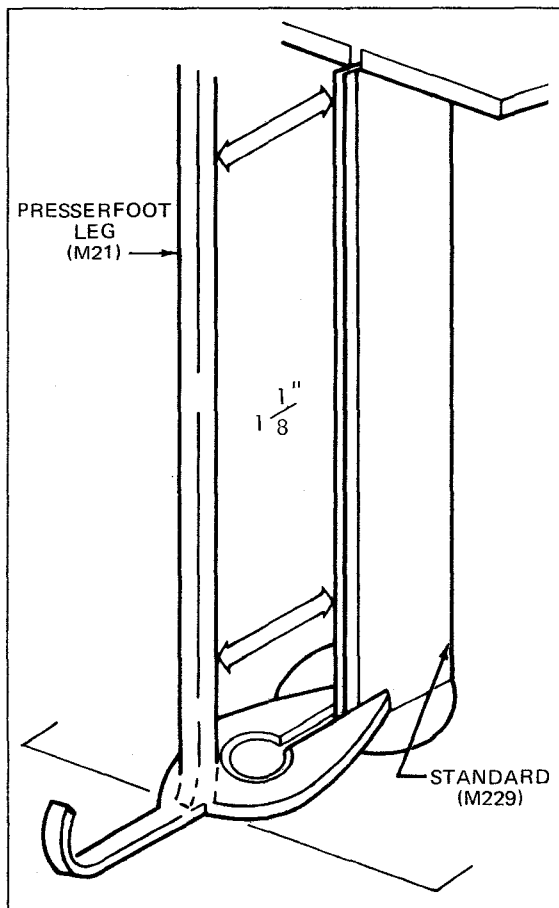
(b) Blade Safety Arm Adjustment - The position of the Blade Safety Arm (M56) affects the sharpening of the left side of the blade. To check its position, remove the left "Flexi-Band", release the Left Guide Spring (M10), and run the sharpener halfway down the blade. Turn off the motor, and disconnect the electrical line from the machine. Move the Left Band Plate (M57) against the blade. The Blade Safety Arm should barely touch the blade when the Shoe (see illustration in Para. 3-3) of the Left Band Plate contacts the blade.

The position of the Blade Safety Arm was correctly set at the factory. If, however, it has been moved forward so that it touches the blade before the left "Flexi-Band" (M70), the left side of the blade will not be sharpened. If the Blade Safety Arm is much further from the blade than the left "Flexi-Band", the bevel on the lower left side of the blade will be unusually wide and the bottom left portion of the blade will be cut away. In either case it will be necessary to reposition the Blade Safety Arm.

First, loosen the Set Screw (M48), and remove the Driven Gear (M47) on the left side. Then slide the Left Drive Pulley (M64) out. Remove the Retaining Ring (M14) so that the Left Band Plate can slip off the Left Band Carrier (M51). The Blade Safety Arm can then be moved either forward or backward after loosening the two screws (M55). Put the Left Band Plate back onto the Left Band Carrier. Test the position of the Blade Safety Arm by moving the Left Band Plate against the blade. The Blade Safety Arm should barely touch the blade when the Shoe of the Left Band Plate contacts the blade. Once the desired position has been attained, tighten the Blade Safety Arm Screws securely, and reassemble the parts onto the sharpener.

(c) Pulley Brake Adjustment - If the sharpener starts by itself or fails to stop running, the fault is generally the Pulley Brake (M245). Remove the Pulley Cover (M207), insert a screwdriver under the Brake (at a point one-third the distance from the lower tip) and across the sides of the Pulley Cover. Bend the bottom portion of the Brake downwards, and remove the screwdriver. The Brake should then be curved so that its bottom tip touches the Pulley Cover. Fasten the Pulley Cover to the Front Housing again. If the Pulley (M131) still turns when the machine is operating, the curve in the Brake must be increased by repeating the method above. If the sharpener stops too far below the top of its traverse, the curve in the Brake must be reduced by removing the Pulley Cover and depressing the Brake with a finger.

(d) Presserfoot Leg Adjustment - To obtain a uniform bevel the entire length of the blade, it is necessary that the Presserfoot Leg (M21) be at the correct distance from the Standard (M229). With the Presserfoot Leg all the way down, the distance from the back of the leg to the Standard should be equal at both the top and at the bottom of the Standard. For the Model M machine, this distance should be approximately 1-1/8" (29 mm). See illustration below:





If the Presserfoot Leg is too far in at the bottom, the "Flexi-Bands" will sharpen a wider bevel on the lower portion of the blade. This condition can be corrected by pulling the Presserfoot Leg out slightly and squeezing the Presserfoot Toes together with pliers. This will cause the Presserfoot Leg to set further out at the bottom.

If the Presserfoot Leg is too far out at the bottom, the bevel becomes narrower on the lower portion of the blade. To correct this condition, lightly tap the curved front of the Presserfoot with a mallet. This will cause the Presserfoot Toes to spread slightly and permit the Presserfoot Leg to move in closer to the Standard.

(e) Pulley Replacement - Occasionally oil gets on the Crank (M206) and the Molded Pulley (M131) causing the Pulley to slip and the sharpener to operate improperly. With a cloth wipe the oil from the Pulley and the side of the Crank while turning the motor by the Knob (M220).

To change a worn Molded Pulley, remove the sharpener from the machine. Insert a rod into the hole in the front of the Pulley Shaft (M130), and unscrew the Pulley Nut (M134). Slide the Molded Pulley off the Shaft, replace with a new Pulley, and lock tightly with the Pulley Nut. Fasten the sharpener onto the machine and replace the Pulley Cover (M207).

(f) Band Carrier Adjustment - After considerable use, the Band Carriers (M49, M51) may wear so that they will have vertical movement on the Carrier Tube (M43). This play could permit the "Flexi-Bands" to drop too far below the blade and cause uneven wear of the bottom of the blade. To remove the vertical play of the Band Carriers, remove the Guide Springs (M10, M15) and the "Flexi-Bands" (M70). Change the Tube Snap Ring (M53) as it may be worn. Then loosen the Carrier Tube Lock Screw (M33), and turn the Carrier Tube clockwise 1/4 turn. Check that the play has been removed but that both Band Carriers still pivot freely. When the adjustment is correct, tighten the Carrier Tube Lock Screw tightly and reassemble.

(g) Sharpener Removal - To remove the sharpener in preparation for disassembly, remove the Presserfoot Lift (M19) by unscrewing the two Presserfoot Lift Screws (M20). Pull the Latch (M3) forward to clear the Chain Roller (M108), and simultaneously pull the Slide (M6) half way down the Frame (M107). Then remove the Pulley Cover (M207) and the four Sharpener Screws (M101, M144, M170), noting that these four screws are of different lengths and must be replaced in the proper locations when the sharpener is attached to the machine again. Pull the sharpener away from the Front Housing (M213).

(h) Sharpener Disassembly - Remove the Presserfoot Leg (M21) by pressing down on the Presserfoot Trigger (M155) and pulling the leg out through the bottom of the sharpener. Remove the Bearing Block (M5) by unscrewing its two screws (M4).

Then pull the Slide (M6) from the Frame (M107). Do not lose the Presserfoot Cam Shoe (M165).

(i) Slide Disassembly - Unhook both Guide Springs (M10, M15) from the Band Carrier Guides (M17, M31). Unscrew the two Spring Studs (M9) and the two Carrier Bracket Screws (M12). The Slide will then slip off the Carrier Block (M29).

Each Band Carrier Guide can be removed by unscrewing the two Slide Guide Screws (M32). The Slide Guide (M30), consisting of two parts snapped together, can be pried apart.

The M Transfer Gear (M35) and the M Reverse Gear (M36) will slip off their shafts after removing the Retaining Rings (M40). The Long Gear Shaft (M41) and the Short Gear Shaft (M42) will come out of the Carrier Block by unscrewing the two Lock Screws (M26).

To remove the Band Carriers (M49, M51), pull the two Retaining Rings (M14) off the Bevel Adjusting Studs (M13) and the Snap Ring (M53) off the Band Carrier Tube (M43). The Band Carriers will then slide off the Tube.

The Band Plate Assembly (M57, M66) separates from the Band Carrier Assembly (M49, M51) by loosening the Set Screw (M48) and sliding the Driven Gear (M47) off the Carrier Drive Shaft (M46). The Drive Pulley (M64) and the Carrier Drive Shaft will then slip out, and the Band Carrier Assembly and the Band Plate Assembly separate.

The Carrier Idler Gear (M45) can be removed from the Band Carrier Assembly by driving out the Carrier Idler Shaft (M44, M54).

The Idler Pulley (M59) is riveted to the Tension Plate (M58) which can be removed from the Band Plate Assembly by lifting off the Band Tension Spring (M62) and unscrewing the Retaining Stud (M61).

To separate the Drive Pulley (M64) from the Carrier Drive Shaft (M46), it is necessary to loosen the Socket Head Screw (M63). To expose this screw, remove the Rubber Tire (M65) by prying it off the Drive Pulley with a drill needle or other narrow tool.

(j) Frame Disassembly - Remove the Presserfoot Cam Shoe (M165). Remove the Front Plate (M169) by unscrewing the two Spacer Rod Screws and the two Front Plate Screws (M106). Lift up on the Presserfoot Trigger to remove the Presserfoot Trigger Spring (M153). Take off the Side Cover (M172) after unscrewing the Side Cover Screw (M173). The Frame (M107) can be removed from the Upper Gear Block (M166) by unscrewing the two Screws (M102, M140) and lifting the Frame from the Upper Gear Block.

The Bevel Gear (M160) can be removed by unscrewing the Stud (M159) and lifting out the Bushing (M161) and Gear. The Pulley Support

Spring (M152) can be removed by pushing up on the Pulley Bracket (M126) and prying the Spring out of the socket in the Pulley Bracket with a screwdriver.

Remove the Pulley Bracket by pulling out the Cotter Pin (M124) from the Trigger Pin (M125), and then lift out the Trigger Pin. The Sharpener Trigger (M120) and Sharpener Trigger Spring (M122) will come off. Next the Pulley Bracket Rod (M121) must be pulled out, but first the Snap Ring (M168A) must be taken off the Rod.

The Front Bracket (M145) can be lifted from the Upper Gear Block by unscrewing one screw (M143). At this point all the gears on the Frame are exposed and can be easily removed by sliding them off their respective shafts. In some cases it is necessary to remove the retaining rings before taking off the gears.

(k) **Sharpener Assembly**- Reassemble the Frame and the Slide. Insert the assembled Slide into the assembled Frame, making sure that the Square Shaft (M18) fits into the Bevel Gear (M160). Place the Presserfoot Cam Shoe (M165) on the Presserfoot Cam (M164) - the thicker section of the Cam Shoe should be against the Presserfoot Leg (M21). Insert the Trigger Spring (M153) into the Presserfoot Trigger (M155), and, with a screwdriver, slide it into its socket on the Upper Gear Block (M166).

Slide the Presserfoot Leg through the Band Carrier Tube (M43) and into the Frame through the "V" Block (M171) and Presserfoot Cam. Press down on the Presserfoot Trigger to permit the Leg to move up past the Cam.

Place the Bearing Block (M5) onto the Square Shaft making sure that the part marked "top" is facing upwards. Fasten it to the Slide with the two Screws (M4).

Attach the sharpener to the Front Housing with the four screws, tightening them evenly and in a clockwise direction. Run the sharpener until the Chain Roller (M108) engages the Latch. Before replacing the Pulley Cover, run the sharpener up and down a few times to make sure that it is operating properly.

Put the "Flexi-Bands" on the sharpener, first making sure that there is a blade in the machine. Run the sharpener once again to test that it is operating and sharpening properly.

Screw the Presserfoot Lift (M19) onto the Presserfoot Leg. Replace the Pulley Cover. Run the sharpener again to make sure that the Pulley Brake (M245) is properly adjusted.

## 5-2. MACHINE

(a) **To Change Carbon Brushes** (single phase machines only) - If the motor starts slowly, probably the Carbon Brushes (M218) are worn out or the Commutator is dirty (See Par. 3-6). To change

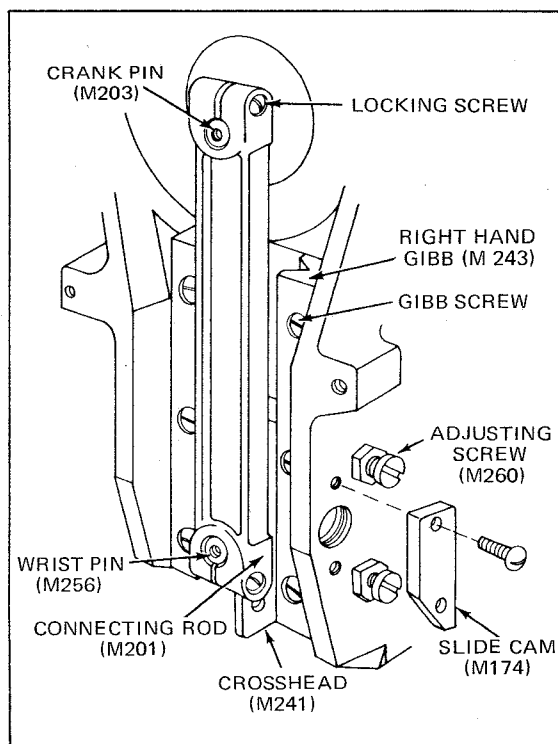
the Carbon Brushes, unscrew the two Cap Screws (M217), pull out the old Brushes, and replace with new ones.

(b) **To Adjust Crosshead and Gibbs** - After six months' use, readjust the Crosshead (M241) and Gibbs (M243) to insure quieter and smoother operation. First remove the sharpener and blade from the machine and then the Slide Cam (M174) on the right side of the Front Housing. Be sure to retighten the Knife Locking Bolt and Nut (M239).

Loosen both Locking Screws on the Connecting Rod (M201). Insert a 6-32 screw [you can use the Slide Cam Screw (M175)] into the Wrist Pin (M256) and draw the Wrist Pin forward to eliminate end play. Tighten the lower Connecting Rod Locking Screw, rotate the motor by hand a few times to seat the Connecting Rod properly on the Crank Pin (M203) and tighten the upper Locking Screw.

Loosen slightly the three Gibb Locking Screws (M242) in the right hand Gibb which is on the same side of the Front Housing as the two Adjusting Screws (M260). Then loosen the Adjusting Screw Nuts, and turn both upper and lower Adjusting Screws just enough to allow the Crosshead to slide up and down without side play.

Lock the Adjusting Screws by tightening the Nuts. Tighten the three Gibb Locking Screws. Turn the motor over several times by hand to be sure that the Crosshead still moves freely. If any binding occurs, reset the Connecting Rod. If bind remains, readjust the Gibbs. Then oil, and turn on the power before replacing the sharpener to make sure that the motor is running properly.

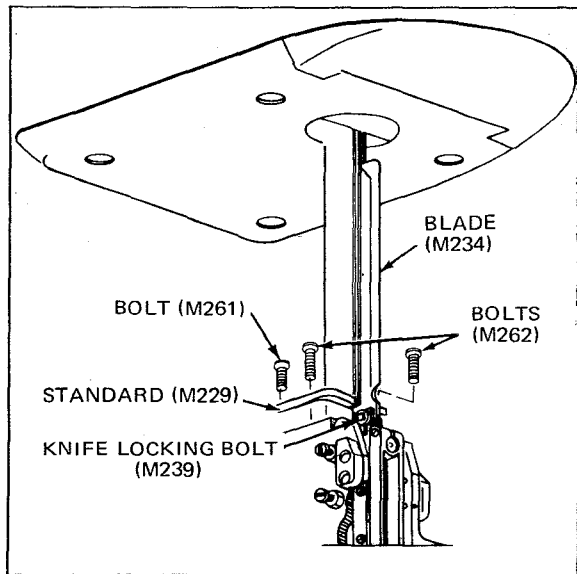


(c) To Set Position of Standard - It is sometimes necessary to change the position of the Standard (M229) because of the readjustment of the Crosshead and Gibbs or replacement of the Inserts. With the sharpener removed, turn the machine upside down and do the following:

Loosen the three Bolts (M261) connecting the Standard to the Front Housing (M213) so that the Standard is free to slide. Then loosen the Knife Locking Nut (M239), and slide a blade (M234) into the Standard and into the Knife Locking Bolt. Move the Standard forward to the point where the back of the "T" slot in the blade will press against the Knife Locking Bolt, causing the blade to cock. Then back off slightly so that the back of the "T" slot has about 1/16" (2 mm.) play on the Bolt, and lock the blade in this position. With the blade secured, keep the Standard pressed firmly against the back of the blade. This will determine the forward position of the Standard.

Rotate the motor with the Knob (M220), and slowly turn the Standard from side to side until the blade determines the freest position. Finger tighten the Connecting Bolts, and check again to make sure that the blade will move freely in the Standard.

Holding the Standard firmly on the Front Housing to prevent shifting, tighten the Connecting Bolts to lock the Standard into place. Rotate the motor by hand again. If there is any binding when the blade is in the machine and none when it is out, the Standard is not properly set and the above procedure must be repeated.



(d) To Replace Inserts - When the Inserts (M253) are worn so badly that there is space to fit two blades between them, they must be replaced.

Remove the two or three Insert Screws (M254) on the right side of the Standard, and slide the old Inserts down and out through the bottom of the Standard. Clean the slot in the Standard, install the new Inserts, and replace the screws. With fine emery cloth or an oil stone rub both ends of each screw in the Standard to eliminate any burrs on the side of the Standard which can interfere with cutting.

(e) To Remove Crank - It is necessary to remove the Crank (M206) from the Armature (M226) in order to change the bearings or to disassemble the motor. First remove the sharpener from the machine to expose the Crank.

Single Phase Machine - Have someone hold the Knob (M220), insert the Knife Key Handle into the hole in the face of the Crank. Tap against the Knife Key in the direction shown by the arrow on the Crank until the Crank loosens on the Armature. The Crank has a left-hand thread and must be turned clockwise to be removed from the armature.

3 Phase Machine - The Crank is secured by a long bolt extending through the armature shaft. Remove the Knob (M220) and insert a 3/16" hexagonal wrench into the head of the bolt. Hold the Crank, and turn the wrench counter-clockwise. As the bolt is unscrewing, tap it lightly on the end to push the Crank forward and out.

(f) To Replace Motor Bearings - The motor bearings must be changed if the motor operates noisily without the Crosshead and Gibbs.

Back Motor Bearing (M219) - Remove the Back Housing (M222) and push the Bearing out. Replace the Back Housing, and tighten the Motor Bolts (M224). Then press in a new Back Bearing. **Note:** When installing a new bearing, place the old bearing behind it while tapping it into the housing. Rotate the old bearing when tapping so that the pressure will be evenly distributed. In this way, neither the inner nor the outer race of the new bearing will be harmed.

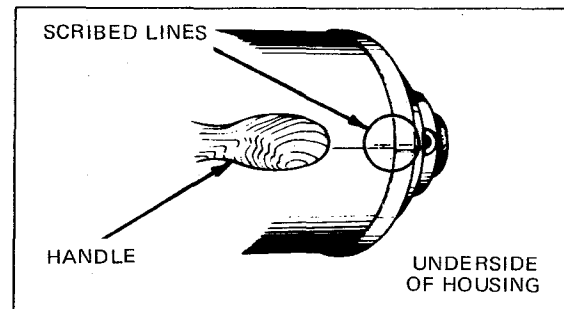
Front Motor Bearing (M246) - Remove the Armature (M226) after removing the Crank and Back Housing. Unscrew the Bearing Lock (M244) and then (from the Armature side) push the Bearing forward and out. Install a new Bearing as described in the previous paragraph.

(g) To Replace Crank Pin Bearing - The Crank Pin Bearing (M204) must be changed when the Crank Pin (M203) is loose in the bearing or when it does not rotate smoothly in the Bearing. Remove the Bearing Lock (M202) on the face of the Crank, remove the screw in the back of the Crank, and tap the Bearing out from the back. Install a new Bearing as described in the previous section.

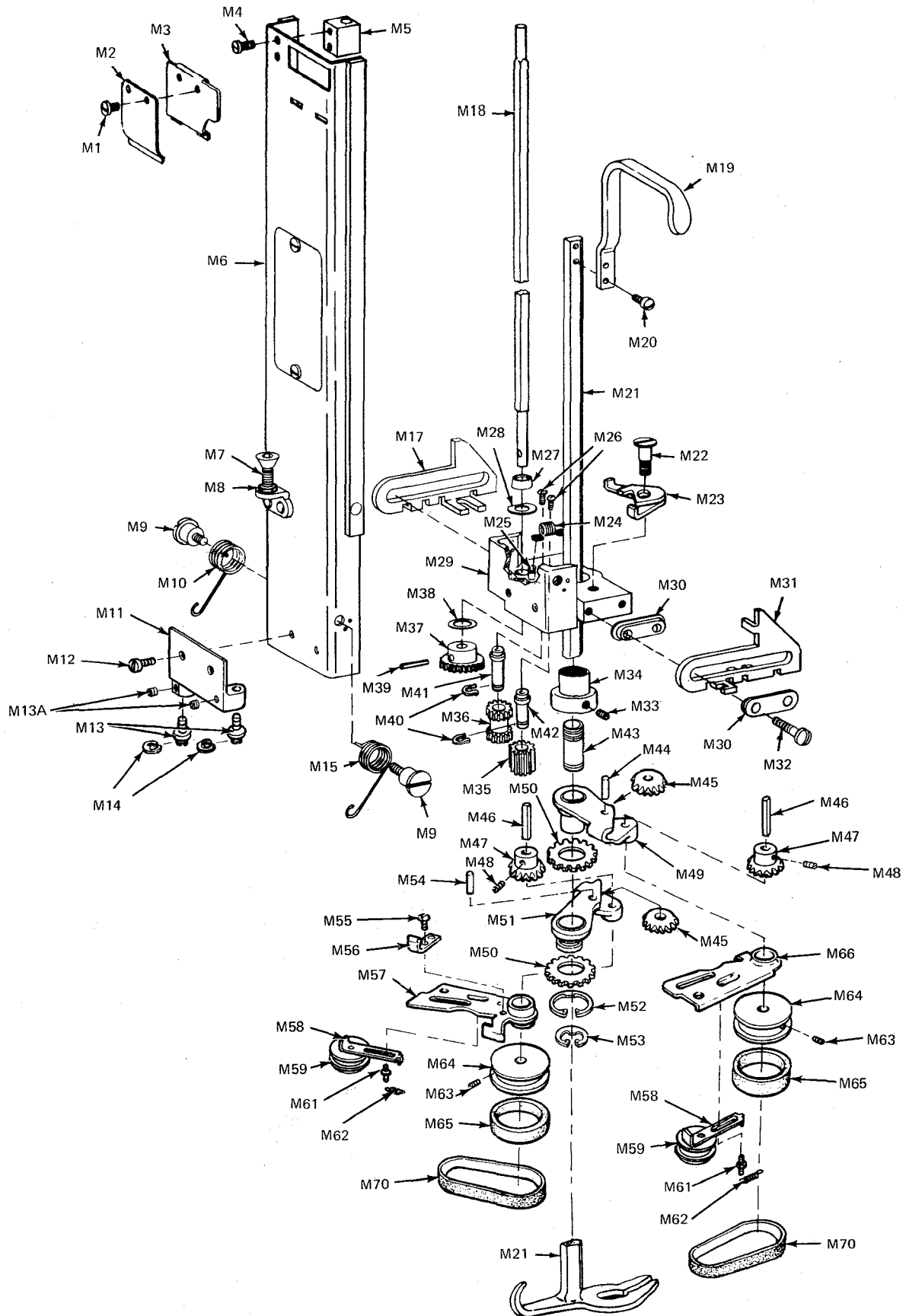
(h) To Reassemble Motor - It is extremely important that the Stator (M216) and the Back Housing (M222) be correctly aligned with the Front Housing. Otherwise, the motor will overheat and may turn in the wrong direction.

The Stator should be placed on the Front Housing so that the model name or "M" insignia on both sides of the nameplate are in the same

horizontal plane. The Back Housing has a line scribed on the underside which matches a line scribed on the underside of the Stator. These two lines must be in line with one another when the Back Housing is replaced onto the Stator. See illustration below.



ALWAYS GIVE MACHINE SERIAL NUMBER WHEN ORDERING PARTS. ORDER BY PART NUMBER - NOT KEY NUMBER.



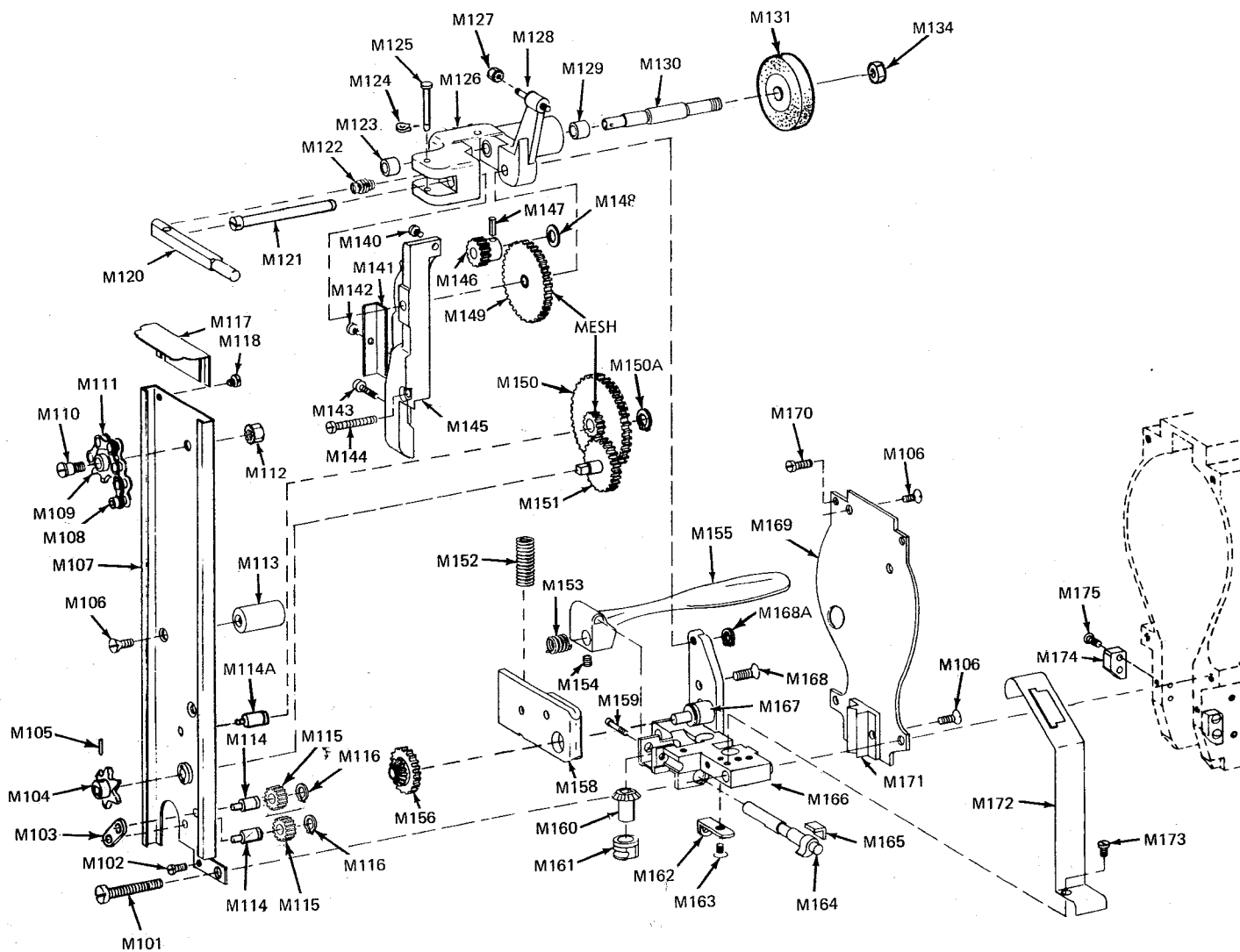
# PARTS LIST 1

KEY	PART NO.	DESCRIPTION	KEY	PART NO.	DESCRIPTION
M 1	802S	Latch Spring Screw	M39	805P	Rollpin For 1280
M 2	802	Latch Spring	M40	1464	Retaining Ring
M 3	801	Latch	M41	1469	Gear Shaft, Long
M 4	811S	Screw For Bearing Block Top	M42	1468	Gear Shaft, Short
M 5	811	Bearing Block Top	M43	1460	Band Carrier Tube
M 6	1486	M Slide (Give Size and Stroke)	M44	1442	Carrier Idler Shaft, Right
M 7	803	Screw For Trigger Stop	M45	1443	Carrier Idler Gear
M 8	803N	Trigger Stop Nut	M46	1439	Carrier Drive Shaft
M 9	1296	Stud For Spring	M47	1444	Driven Gear
M10	1295	Spring, Left, For Guide 1471	M48	1448	Set Screw For 1444
M11	1461	Carrier Bracket	M49	1434	Band Carrier Only, Right
M12	822S	Screw For Carrier Bracket		1432	Band Carrier Assy., Right (1434, 1439, 1442, 1443, 1444)
M13	1467	Bevel Adjusting Stud	M50	1285	Gear, Stone Carrier, 32T
M13A	1448	Set Screw For 1467	M51	1433	Band Carrier Only, Left
M14	882D	Retaining Ring		1431	Band Carrier Assy., Left (1433, 1439, 1441, 1443, 1444)
M15	1294	Spring, Right, For Guide 1472	M52	1261	Snap Ring For 1421
M17	1471	Guide For Band Carrier, Left	M53	1277	Snap Ring For 1460
M18	1229	M Square Shaft (Give Size & Stroke)	M54	1441	Carrier Idler Shaft, Left
M19	824	Presserfoot Lift	M55	822S	Screw For 1425
M20	824S	Screw For Presserfoot Lift	M56	1425	Blade Safety Arm
M21	1171	M Presserfoot Leg (Give Size)	M57	1421	Band Plate, Left
M22	1269	Pivot Screw For 1266		1401	Band Plate Assy., Left (1421, 1410, 1414, 1415, 1425)
M23	1266	Presserfoot Leg Guide	M58	1410	Tension Plate With Idler Pulley and Stud
M24	1265	Spring For Presserfoot Leg Guide	M59	1412	Idler Pulley (Sold Only with 1410)
M25	1262	Pin For 1265 Spring	M61	1414	Retaining Stud
M26	822S	Screw To Lock Stud 1468 & 1469	M62	1415	Band Tension Spring
M27	813	Square Shaft Collar	M63	1448	Screw, Socket Head, For 1447
M28	1245	Collar Washer, M Square Shaft	M64	1447	Drive Pulley
M29	1475	M Carrier Block w/1254 and 1255	M65	1449	Rubber Tire
M30	1329	Slide Guide (Nylon)	M66	1422	Band Plate, Right
M31	1472	Guide For Band Carrier, Right		1402	Band Plate Assy., Right (1422, 1410, 1414, 1415)
M32	1328	Screw For Slide Guide	M70	1450	Flexi-Band, Coarse 100/box
M33	1255	Lock Screw, Carrier Tube		1451	Flexi-Band, Medium 100/box
M34	1254	Carrier Tube Bushing		1452	Flexi-Band, Fine 100/box
M35	1466	M Transfer Gear			
M36	1465	M Reverse Gear			
M37	1280	M Square Shaft Gear			
M38	1279	Washer For Square Shaft Gear			

Always Give Machine SERIAL NUMBER When Ordering Parts.

Order By PART NUMBER – Not Key Number.

ALWAYS GIVE MACHINE SERIAL NUMBER WHEN ORDERING PARTS. ORDER BY PART NUMBER - NOT KEY NUMBER.



## PARTS LIST 2

KEY	PART NO.	DESCRIPTION	KEY	PART NO.	DESCRIPTION
M101	859C	Screw, Mounting – Lower Right	M142	848CS	Screw For 848C
M102	859S	Screw For Upper Gear Block	M143	848T	Screw, Lower, For Front Bracket
M103	1479	Back Plate	M144	848B	Screw, Mounting—Lower Left
M104	837	Drive Sprocket	M145	1184A	M Front Bracket
M105	837R	Pin For Driver Sprocket	M146	839	Gear, 16 Teeth
M106	870S	Screw For Spacer Rod and Front Plate	M147	839P	Pin, Gear
M107	1485	M Frame (Give Size And Stroke).	M148	839W	Washer, Gear
M108	834R	Chain Roller	M149	830	Gear Assembly, 50/12 Teeth
M109	835	Idler Sprocket		*830A	Gear Assembly, 50/20 Teeth
M110	836	Stud For Idler Sprocket	M150	829	Gear Assembly, 64/20 Teeth
	836A	Eccentric Stud (W/807W)		*829C	Gear Assembly, 56/20 Teeth
M111	1125	M Chain (Give Size and Stroke)	M150A	1481	Retaining Ring
M112	836N	Nut For Idler Sprocket	M151	828	Sprocket Gear, 32 Teeth
M113	1151	Spacer Rod	M152	1191	M Pulley Support Spring
M114	1480	Stud For 12T Gear	M153	492	Trigger Spring
M114A	829B	Stud For 829 Gear	M154	490	Trigger Screw
M115	1493	Gear, 12 Teeth	M155	489	Presserfoot Trigger
M116	1481	Retaining Ring	M156	843	Gear 28/16T, Mitre Assembly
M117	831	Cover Slide Top	M158	1164	Plate For 1191 Spring
M118	831S	Screw For Cover Slide Top	M159	841A	Stud For Bevel Gear Bushing
M120	840	Trigger For Sharpener	M160	842B	Bevel Gear, 16 Teeth
M121	1340	Rod For Pulley Bracket (with 1158A)	M161	841B	Bushing For Bevel Gear
M122	840A	Spring For Sharpener Trigger	M162	858A	Cam Bracket
M123	838C	Bushing (Front) For Pulley Support	M163	858S	Screw For Cam Bracket
M124	840D	Retaining Ring	M164	856	Presserfoot Cam
M125	840P	Trigger Pin	M165	856L	Presserfoot Cam Shoe
M126	1492	M Pulley Bracket w/Bushings	M166	1158A	M Upper Gear Block
	1495	M Pulley Bracket With 1494 And 839	M167	1159	M Pivot Stud
M127	846N	Nut, Safety Lock	M168	1161	Screw For Plate 1164
M128	846S	Screw, Safety Lock	M168A	1341	Snap Ring For Rod (for 1340)
M129	838B	Bushing (Back) For Pulley Support	M169	1193X	M Front Plate With V Block
M130	1491	M Shaft For Pulley	M170	1187	Sharpener Anchor Screw - 3/8" Long
	1494	M Pulley Assembly With 1491 And 1497	M171	1194	V Block
M131	1497	Molded Pulley	M172	1325	M Side Cover
M134	838N	Nut For Pulley	M173	869S	Screw For Side Cover
M140	848S	Screw, Upper, For Front Bracket	M174	1327	Slide Cam (Nylon)
M141	848C	Spacer, Front Bracket	M175	1328	Screw For Slide Cam

\* For Half Speed and Cyclomatik Machines Only.

Always Give Machine SERIAL NUMBER When Ordering Parts.

Order By PART NUMBER – Not Key Number