INSTALLATION

The MC HEAVY DUTY-TYER is packed with crate and shipped to you. Uncrate your machine and attach the guard according to the instruction enclosed with your machine.

THREADING INSTRUCTIONS

1. TURN switch to "OFF" position.
2. RAISE twine from end of "TWINE CONE" to hole (1) in "TENSION BRACKET".
3. PULL twine through hole (1) to hole (2) in "TENSION BRACKET".
4. PULL twine upward and to thread guide roller (3).
5. PUSH twine into hole (4) and to thread guide roller (4).
6. PULL twine through thread guide roller (4) using tweezers.
7. PULL twine through thread guide roller (5).
8. PULL twine through thread guide roller (6) at end of drawback lever.
9. PULL twine through thread guide roller (7).
10. PULL twine through thread guide roller (8).
11. PUSH twine into hole (9) at end of twine arm.
12. HOLDING twine with left hand, PULL it under and around BUTTON (C-46) releasing BUTTON LEVER (C-29) with right hand - See FIG.2
13. PULL twine tightly with left hand until twine SLIDES INTO CUTTING POSITION.
14. PULL KNIFE HOLDER LEVER (K-64) with right handle until twine is cut - See FIG.3
15. TURN switch to "ON" position.

FIG.1

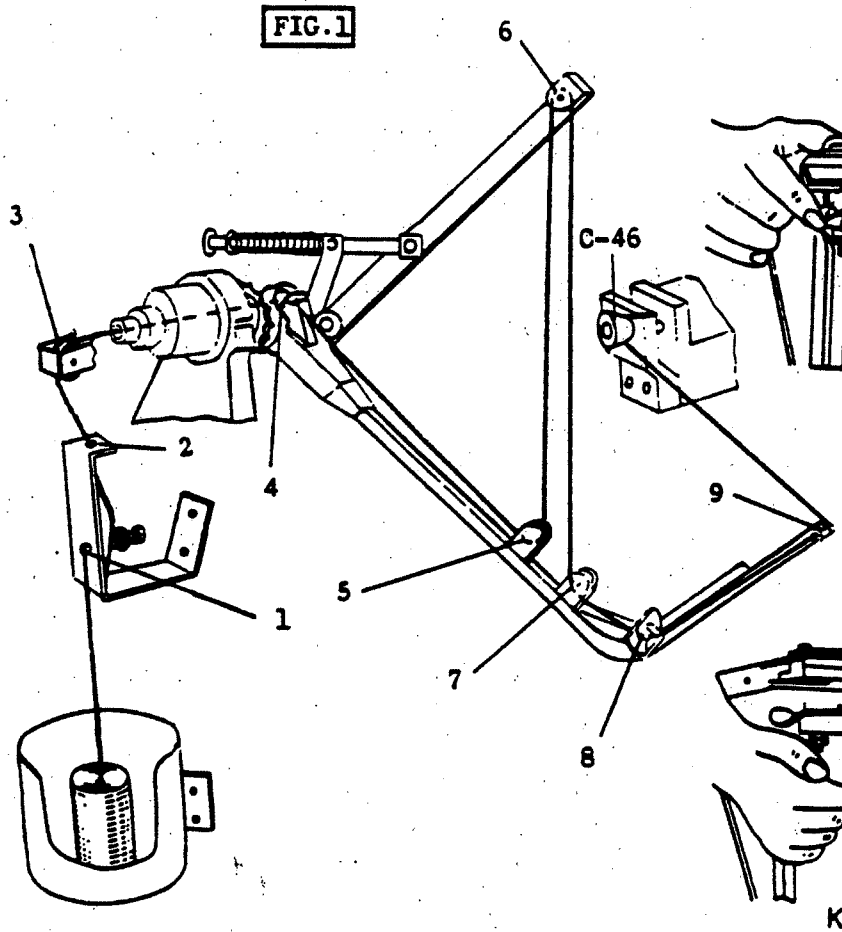


FIG.2

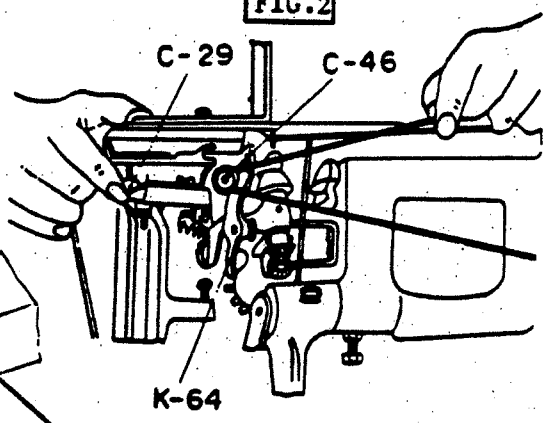
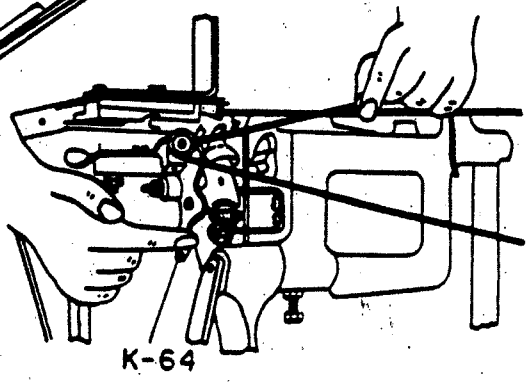
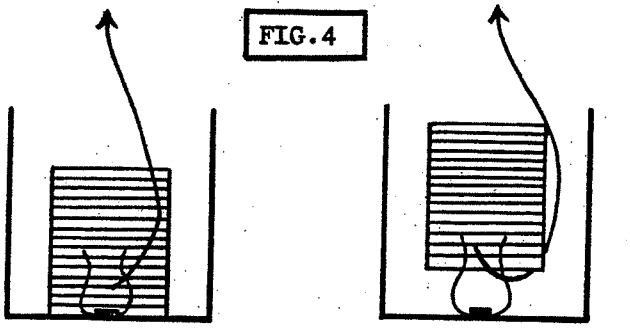


FIG.3



The twine can is located at the rear of the machine. A metal cramp is provided at the center of the twine can. Be sure that the twine cone is properly placed in the twine can. The wrong setting may result a tangling of the twine under the twine cone and then faulty tying- See FIG.4

FIG.4



PROPERLY INSTALLED IMPROPERLY INSTALLED

MACHINE OPERATION

Before your machine is operated by MOTOR, we suggest making a through study of your machine by HAND operation. Especially, when the machine is operated after repaired or replacement of parts, this HAND operation is recommended to prevent the machine from any troubling.

To test your machine over by HAND,

1. Make sure that the machine is threaded properly and a package in place.
2. Turn switch to "OFF" position.
3. Open "PEEP DOOR" located on the side where you will find the name plate with a serial number.
4. Step on the foot pedal. Grasp the pulley wheel at the top and pull down.
5. Then, the complete cycle of twine arm and tying procedure can be observed when HAND operated in this manner.
6. Turn switch to "ON" position.
7. Turn safety lock handle to "START" position and your machine is ready for use.

PROPER OPERATING PROCEDURE

1. Grasp both ends of the package between thumbs and fingers- See FIG.5
2. Make sure that the package to be tied is positioned FLUSH against vertical standard- See FIG.6
3. Step on the foot pedal, INSTANTLY removing the foot.
4. Hold the package steady and firm until tie is complete.

FIG.5

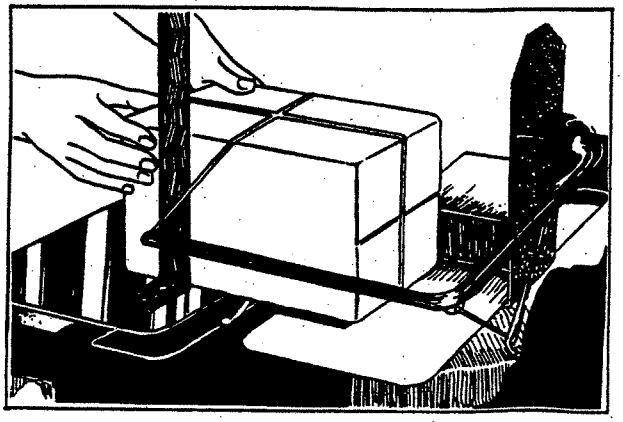
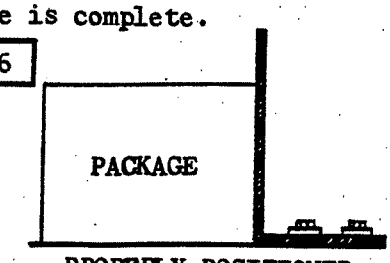
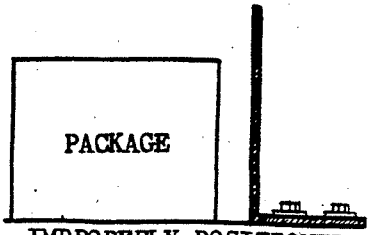


FIG.6



PROPERLY POSITIONED



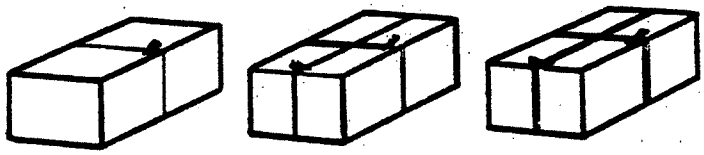
IMPROPERLY POSITIONED

ONE WAY WRAPS

Your Tying Machine will make a SINGLE, DOUBLE or TRIPLE one way wrap on the package by the following steps.

1. Package should be placed in the position that the center is directly over the separation of the solid table and loose table.
2. Hold the package firmly in tying position.
3. Step on the foot pedal, INSTANTLY removing the foot.
4. Remove the package as soon as the tie is completed.

FIG.7



SINGLE WRAP DOUBLE WRAP TRIPLE WRAP

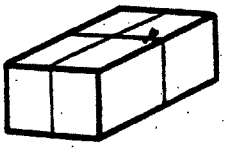
CROSS TIES

To change Your Tying Machine from ONE WAY WRAPS to CROSS TIES, Clutch Kickout (D-6) must be attached to the Cam Shell Assembly.

Please observe the following procedure in making CROSS TIES.

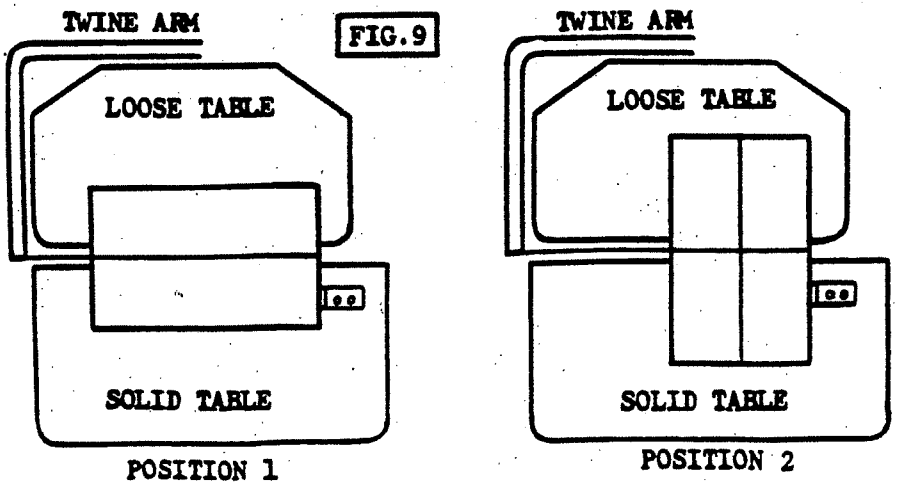
1. Place the package on the table for the longer-way wrap first- See FIG.9
2. Hold the package firmly in tying position and step on the foot pedal, INSTANTLY removing the foot.
3. The twine arm makes one wrap and then stops. Grasp the package and turn it by 90° in a clock-wise direction, bringing the right hand toward the body. In this case, do not push the package away from the body, but rather draw back slightly.
4. Holding the package firmly and step on the foot pedal again, INSTANTLY removing the foot.
5. The twine arm makes another one wrap and the machine ties the knot for cross ties.

FIG.8



CROSS TIES

FIG.9



PRECAUTION FOR OPERATING YOUR MACHINE

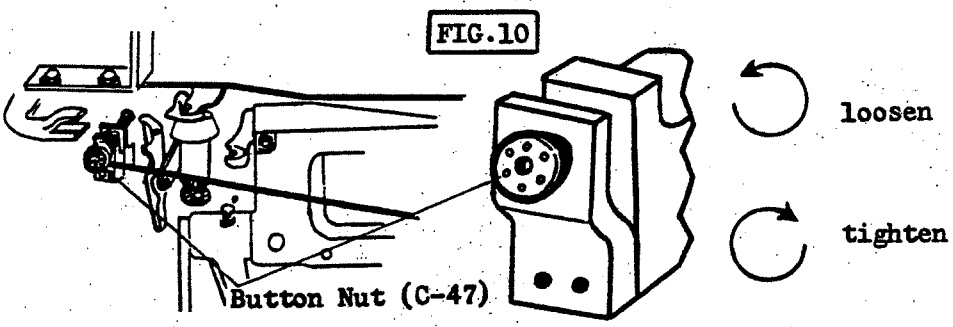
1. TWINE Your machine is adjusted for a definite size twine, 28mm to 35mm Polyethylene flat twine in spool. It is recommended this size of twine shoud be used at all times. If other twine is used, it may jam or damage the machine. Please contact our agent if you desire to use other twine than that of designated.

2. THREADING Be sure that your machine is threaded properly. A wrong threading is the major cause of machine not working properly.

3. STRINGHOLDER BUTTON Too much spring pressure on the stringholder button against the twine running tension will cause the twine break, leaving small piece of twine in 3mm to 5mm long at the back of the stringholder button. This can be adjusted by loosening the button nut in a counter clock-wise direction- See FIG.10
Keep the stringholder button free of broken bits of twine. This will take the tension from the end of the twine and cause a half or single loop knot tying. Pull the button lever toward operator for releasing the tension and remove small bits of twine. Do not use a sharp tool to release the button tension. Use only the button lever - See FIG.2

Do not file the face of the stringholder casting. It is filed by a trained engineer precisely for a purpose. Necessary adjustments can be made by regulating the spring tension or the button nut.

FIG.10



4. TWINE RUNNING TENSION Twine running tension can be adjusted by the flat spring on the tension bracket at the back of the machine by turning the adjusting nut- See FIG.11 If the tension is too tight, loosen the nut until proper tension is made. If the tension is too loose, tighten the nut until tension is correct.

5. BEST TWINE TENSION A smooth twine running tension is always the best. If your machine is used with a designated twine, threaded properly and adjusted correctly both in the running tension and the stringholder tension, the drawback lever of the twine arm will come to a stop between the TWO RED ARROW LINES labeled on the back of loose table. In other words, if the drawback lever is between the TWO RED ARROW LINES, your machine is threaded properly with the best twine tension-See FIG.12

FIG.11

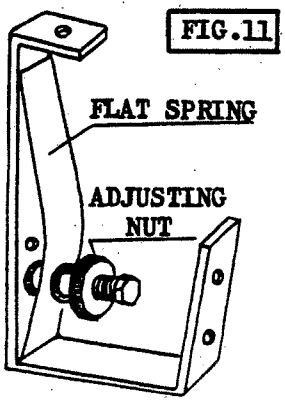
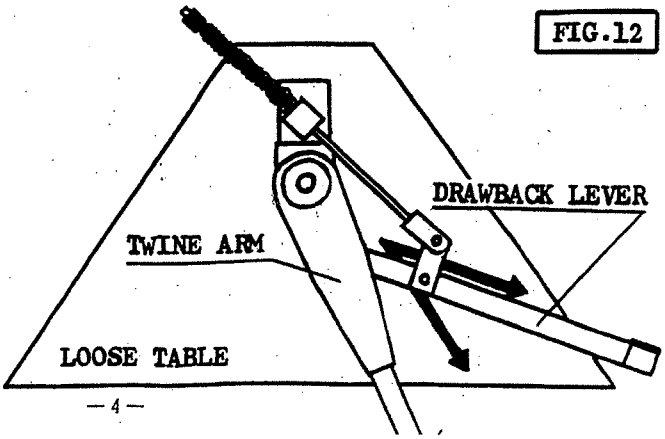
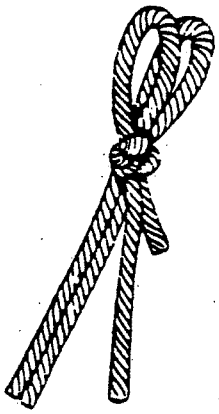


FIG.12





PROPER KNOT

If your machine is correctly maintained and properly adjusted, it will make a PROPER KNOT which has two long even loops, three long ends and one short end, and a tight and hard knot as illustrated.

IMPROPER KNOT

If your machine will make such IMPROPER KNOTS as illustrated below, the machine should be quickly adjusted or repaired according to the TROUBLE SHOOTING procedures given in the following.

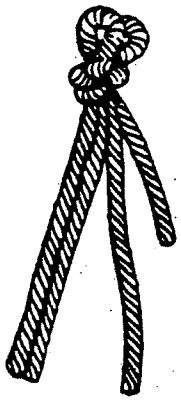
IMPROPER KNOTS	CAUSES	REPAIRING
LOOSE KNOT or SHORT LOOPS 	1. Clearance between Jaw and Stripper	1. Replace Jaw and Stripper
	2. Knotter head improperly installed	2. Re-install Knotter head properly
	3. Jaw releases twine too quick.	3. Loosen Nut (C-62) and adjust loop pulling tension by turning Adjusting Cap Screw (C-50) - See FIG.13
	4. Imporper adjustment between Jaw and Stripper	4. Adjust Stripper in vertical position- See FIG.14
	5. Weak Flat Spring (B-10)	5. Replace Flat Spring (B-10) - See FIG.23
	6. Incorrect twine is used	6. Replace with proper twine
	7. Stripper does not work effectively. (a) Broken Spring (C-42) (b) Stripper became dirty (c) Pin-Riser(C-16) is bent	7. (a) Replace Spring (C-42) (b) Clean once every six months (c) Straighten or replace Pin-Riser (C-16)

FIG.14

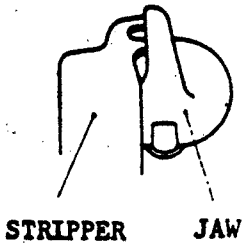
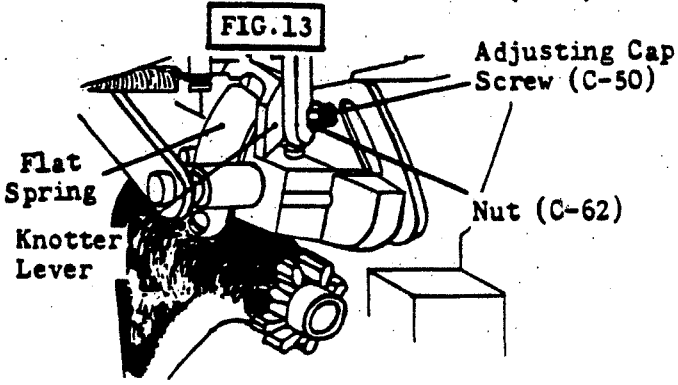
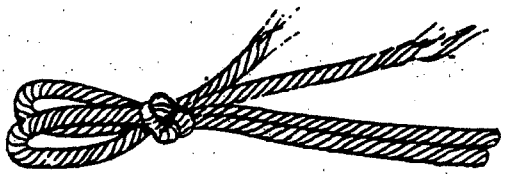
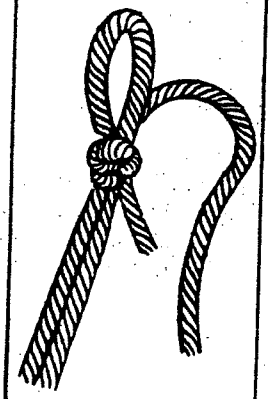
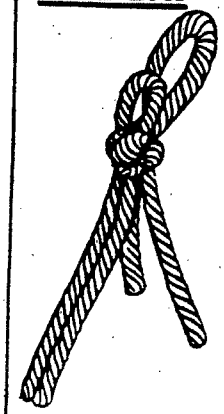


FIG.13



IMPROPER KNOTS	CAUSES	REPAIRING
BREAK IN TWINE 	1. Jaw and Stripper are incorrectly adjusted in vertical position 2. Flash around Jaw 3. Incorrect twine is used 4. Tension of Stringholder Button is too tight.	1. Adjust Stripper in vertical position - See FIG.18 & 24 2. All edges must be kept smooth by oil stone or emery cloth 3. Replace with propoer twine 4. Loosen Stringholder Button tension- See FIG.10
RAGGED END 	1. Knife is dull	1. Knife must be sharpened by grinding on oil stone or replaced with new one
SINGLE LOOP 	1. Twine running tension is too tight against string-holder button tension. 2. End of Stringholder assembly is worn 3. Clogged Stringholder Button 4. Twine is improperly placed in the twine can or threaded.	1. Loosen twine running tension- See FIG.11 2. Replace with new String-holder assebmly 3. Keep Stringholder Button clear of lint and bits of twine 4. Check twine threading
LONG LOOP AND SHORT LOOP 	1. Incorrect twine is used. 2. Tension of Stringholder Button is too tight. 3. Improper adjustment between Jaw and Stripper 4. Knotter Lever Spring is weak. 5. There is dirt between JAW-upper and JAW-lower. 6. Knife cuts the twine slow too late.	1. Replace with proper twine 2. Loosen Stringholder Button tension- See FIG.10 3. Adjust Stripper in vertical position- See FIG.14 4. Replace Flat Spring (B-10) - See FIG. 23 5. Clean the dirt-See FIG.23 6. Replace Knife or Knife Holder-See MAIN TROUBLE SHOOTING (9)

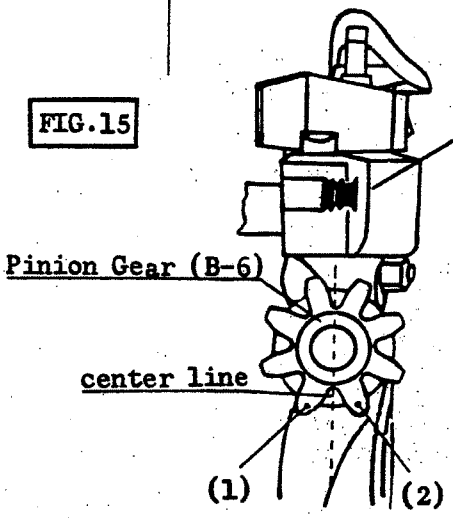
MAIN TROUBLE SHOOTING

TROUBLES	CAUSES	REPAIRING
1. Switch is ON, but Motor does not start running	1. Poor contact between plug and AC outlet 2. Loose wire of the cord 3. Cord is broken 4. Switch is broken 5. Motor is defective	1. Repair or replace plug and AC cord 2. Same as No.1 3. Same as No.1 4. Same as No.1 5. Same as No.1
2. Motor rotates, but machine does not operate (When foot pedal is depressed, twine arm does not rotate.)	1. Loose V-belt 2. There is oil on the friction disc (E-4) 3. Clutch Kick Lever does not fully disengaged. 4. Taper Pin (E-21) on Pinion Gear is broken. 5. Taper Pin (E-22) on Collar is broken	1. Remove motor adjusting washer 2. Disassemble Clutch Pulley (E-1) and clean it 3. Hit the end of Pedal (A-105) to the floor 4. Replace Taper Pin (E-21) 5. Replace Taper Pin (E-21)
3. Twine arm does not rotate after the foot pedal is stepped on.	1. Something is stuck below the Foot Pedal 2. V-belt is expanded 3. Clutch Kick Lever (E-13) is not completely pulled out. 4. Oil is stuck on the face of Friction Disk (E-4) 5. Taper Pin (E-21) on Pinion is broken 6. Taper Pin (E-22) on Collar is broken	1. Check Foot Pedal 2. Remove motor adjusting washer 3. Disassemble Clutch Pulley (E-1) and clean it. 4. Disassemble Clutch Pulley (E-1) and clean it 5. Replace Taper Pin (E-21) 6. Replace Taper Pin (E-22)
4. Clutch Pulley (E-1) squeaks	1. Insufficient lubricant between Clutch Pulley (E-1) and Shaft (E-30) 2. Clutch Fork (E-3), Clutch Kickout (D-6) or Clutch Lever (E-12 & E-13) is worn out.	1. Add grease (Supply grease once every six months) 2. Replace worn out parts.
5. Jaw and Drawslide bound or seized	1. Drawslide insufficiently lubricated 2. Weak Drawslide Spring (C-4)	1. Lubricate. 2. Replace Spring (C-4)
6. Jaw does not catch twine pushed by Drawslide (K-38)	1. End of Drawslide (K-38) is worn out. 2. Drawslide Cam (K-19) is worn out. 3. End of Arm (C-10) is worn out. 4. Drawslide Spring (C-4) is bent or twisted. 5. Knotter Head Cam (D-4) is worn out.	1. Replace Drawslide (K-38) 2. Replace Drawslide Cam (K-19) 3. Replace Arm (C-10) 4. Correct Spring (C-4) 5. Replace Knotter Head Cam (D-4)

MAIN TROUBLE SHOOTING

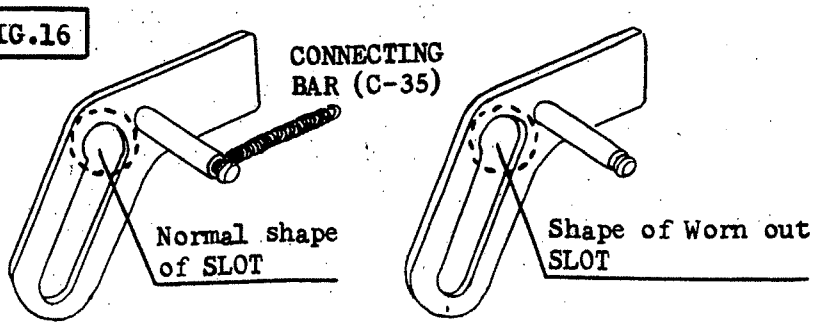
TROUBLES	CAUSES	REPAIRING
7. Broken Knotter Head mounting Bolt (B-26) is	1. Bolt excessively tightened	1. Tighten Bolt (B-26) moderately
8. Jaw overruns (May cause the bending of Drawslide K-38)	1. Package is removed from the solid table before tying is completed 2. Knotter Lever opening is too wide 3. Knotter Lever is worn out 4. Bevel Gear (B-5) does not engage properly	1. Remove package after tying is completed 2. Move Adjusting Cap Screw (C-50) back and adjust the opening - See FIG.13 3. Replace Knotter Lever (K-55) 4. Correctly install Jaw and engage Bevel Gear (B-5) teeth, so that Pinion Gear (B-6) teeth will be as shown in FIG.15
9. Knife does not cut twine (Knife Holder K-64 does not operate)	1. Knife is not properly installed 2. Loose Screw (B-18) 3. Knife Holder spring (C-37) is weak 4. Knife Holder Nut (C-72) is loose. 5. Cap Bolt (K-71) is loose. 6. Screw (B-18) is worn out 7. Slot of Connecting Bar (C-35) is worn out	1. Properly install Knife (C-33) 2. Tighten Screw (B-18) 3. Replace Spring (C-37) 4. Tighten Nut (C-72) - See FIG.29 5. Tighten Cap Bolt (K-71) 6. Replace Screw (B-18) 7. Replace Connecting Bar (C-35) - See FIG.16

FIG.15



When the Knotter is timed properly, two of the Pinion Gear teeth straddle over the center Line. If they are not positioned like that, remove the 3-18 Spring Pin and adjust the B5A Bevel Gear so that the Knotter is timed properly and then reset the 3-18 Spring Pin.

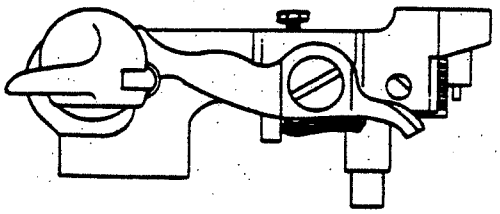
FIG.16



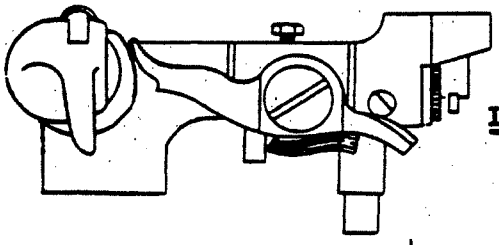
MAIN TROUBLE SHOOTING

TROUBLES	CAUSES	REPAIRING
10. Twine slips out of Button when Twine Arm rotates.	1. Excessive tension of Flat Spring in Tension Bracket 2. Insufficient Button force 3. Twine not properly threaded.	1. Loosen tension of Flat Spring- See FIG.11 2. Tighten Button force - See FIG.10 3. Check twine threading - See FIG.1
11. Twine Arm rotates repeatedly.	1. Clutch Lever (E-12) is worn out. 2. Clutch Fork (E-3), Clutch Kickout (D-6) or Clutch Connecting Crank (E-14) is worn out	1. Replace Clutch Lever (E-12) 2. Replace worn out parts - See FIG. 26 & 30
12. Twine Arm rotates, but machine stops immediately before tying (Switch "OFF" immediately)	1. Jaw overruns 2. Loose Screws or damaged parts	1. Dismount Knotter Head and mount Jaw properly on the machine as shown in FIG.17 2. Operate the machine by HAND and locate the trouble - See MACHINE OPERATION
13. Too much strain on Twine Arm	1. Brake is too strong.	1. Decrease braking effect (If Brake is too weak, the depressions in the Main Gear cogs will be worn away by the vibration absorbing roller)

FIG.17



PROPER MOUNTING OF JAW



IMPROPER MOUNTING OF JAW

HOW TO ADJUST THE STRIPPER

1. Adjust the relative position of the STRIPPER and JAW as shown in FIG.18

2. Loosen the Nut by turning to a counter clock-wise.
3. Adjust the STRIPPER and JAW by turning the Bolt to a clock-wise or counter clock-wise direction.
4. Check to see if the notch in the STRIPPER is in line with the point of the JAW as the JAW withdraws from the STRIPPER - See FIG.24

5. The positional relation between the STRIPPER and JAW should be as shown in FIG.19 If there is a gap between the STRIPPER and JAW as shown in FIG.20, it may result in faulty tying of package or incorrect knot tying. If there is a gap, replace the STRIPPER or JAW as required. If there is a play in the Knotter Head, disassemble it and install correctly.
6. Tighten the Nut by turning to a clock-wise direction.

FIG.18

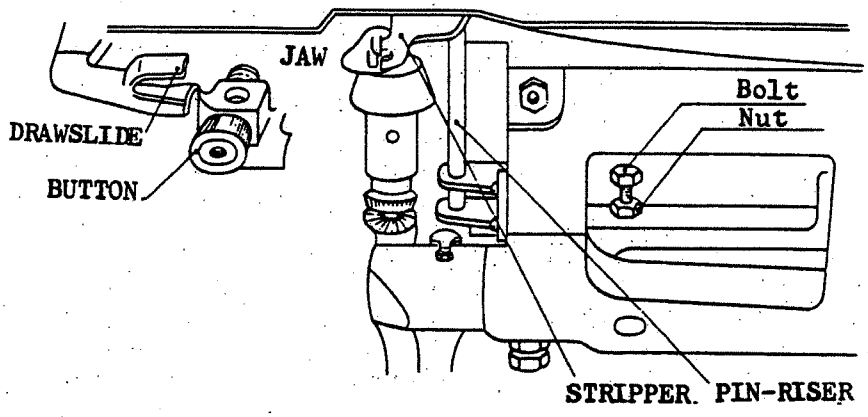
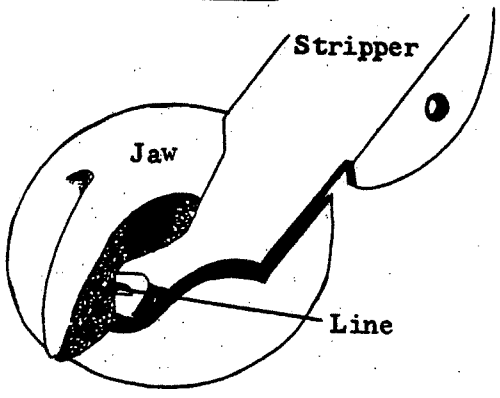


FIG.24



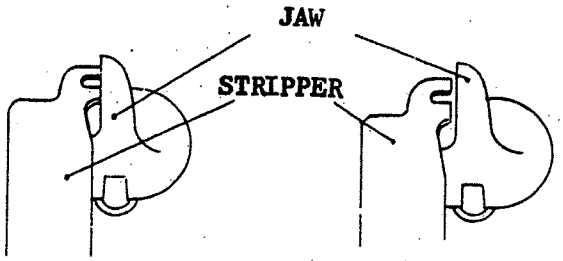


FIG.19

NORMAL CONDITION

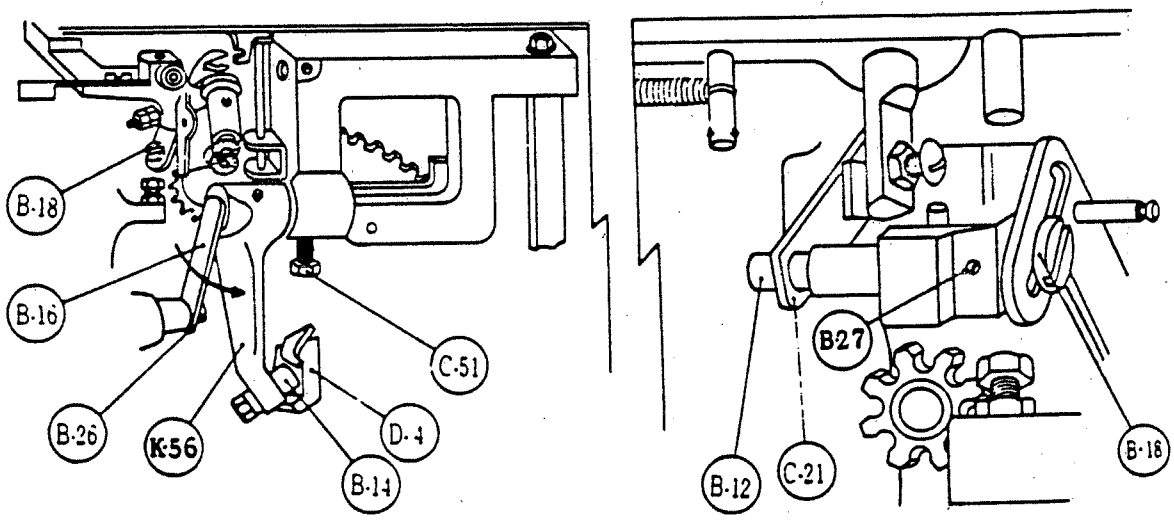
FIG.20

WORN-OUT CONDITION

HOW TO REPLACE THE KNOTTER HEAD

1. Turn switch to "OFF" position and depress the foot pedal.
2. Manually rotate the machine in reverse until Roller (B-14) is positioned in the Knotter Head Cam (D-4) - See FIG.22
3. Remove Screw (B-18).
4. Loosen Bolt (C-51).
5. Loosen Bolt (B-26) and then turn Knotter Head Shaft (B-16) up to 45° in the arrow direction and pull it out toward operator.
6. Holding the KNOTTER HEAD (K-56) by hand, remove Tip-up Lever (C-21) from Connecting Pin (B-12). The Knotter Head assembly can be completely disassembled in the above practice.
8. Install the Knotter Head assembly in the sequence of 2, 6, 5, 4, and 3.

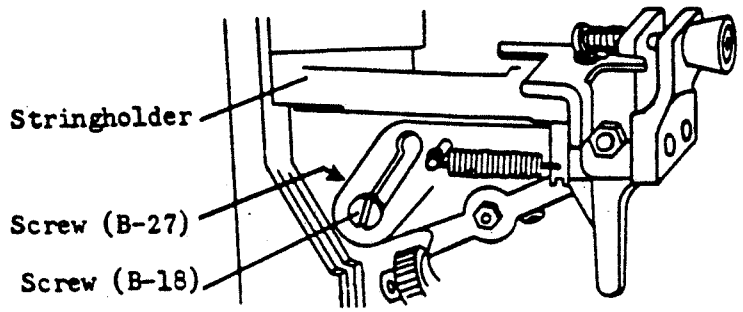
FIG.22



HOW TO REPLACE THE STRINGHOLDER

1. Remove Screw (B-27)- See FIG.22 & FIG.28
2. Remove Screw (B-18).
3. Remove Cap Bolt (K-71) - See FIG.27
4. Remove Stringholder downward.
5. Install Stringholder in sequence of 3, 2 and 1 - See FIG.21

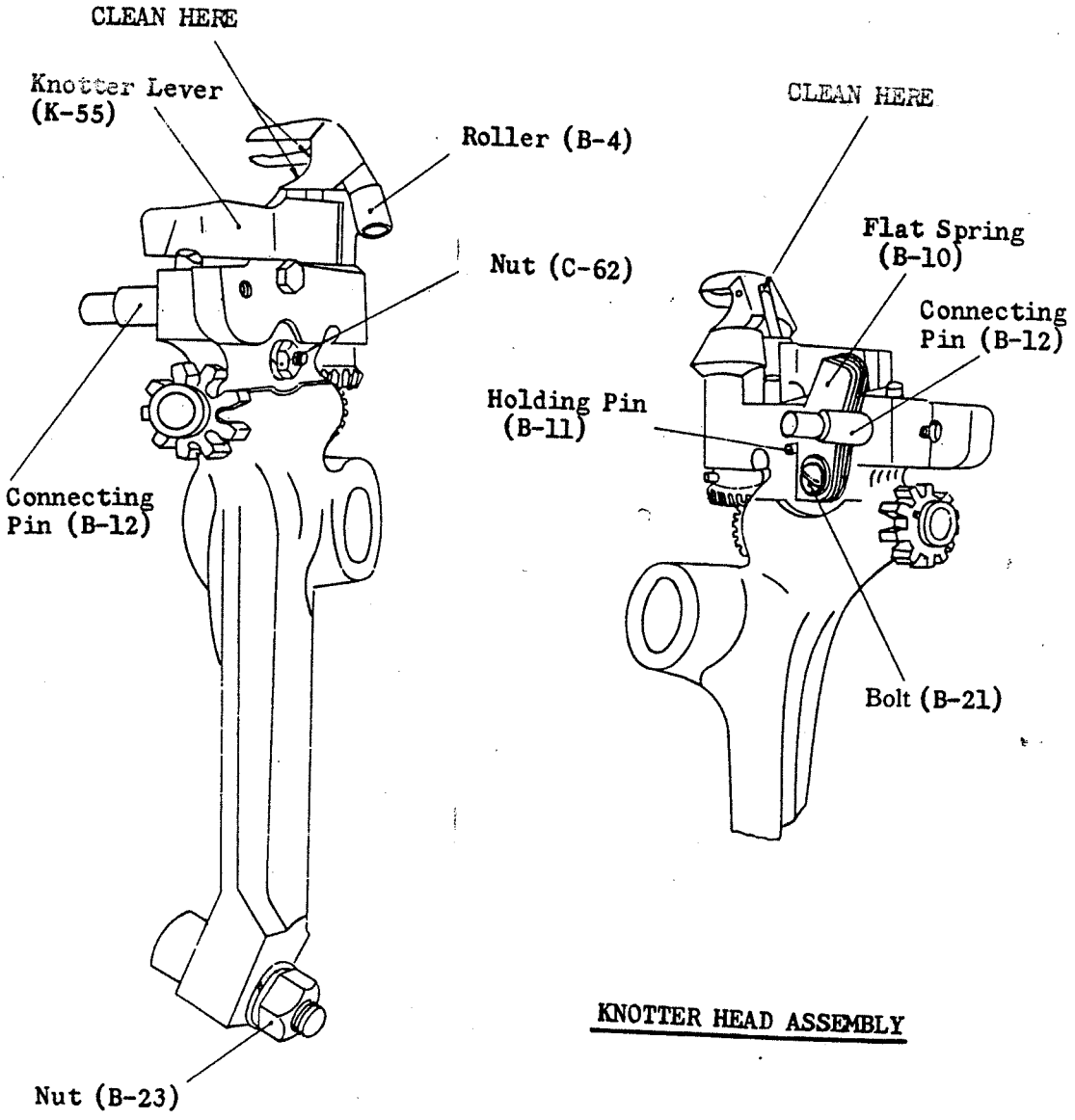
FIG.21



HOW TO REPLACE THE KNOTTER HEAD FLAT SPRING

1. Remove Nut (C-62) - See FIG.23
2. Remove Round Head Screw (B-21) by turning to a counter clock-wise direction.
3. Insert FLAT SPRING (B-10) between Holding Pin (B-11) and Connecting Pin (B-12) and secure with Round Head Screw (B-21).
4. Finally, install Nut (C-62) and tighten.
5. Excess tightening will cause the FLAT SPRING to break prematurely. Insufficient tightening will result in faulty tying.

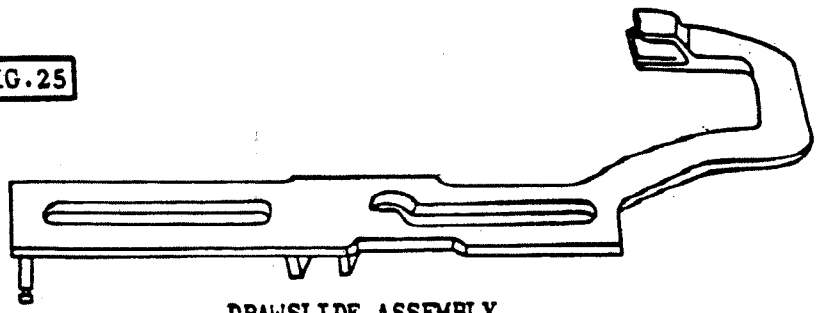
FIG.23



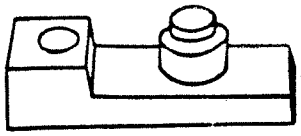
KNOTTER HEAD ASSEMBLY

MAIN WEARING PARTS

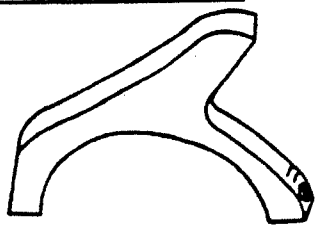
FIG.25



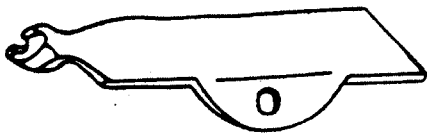
DRAWSLIDE ASSEMBLY



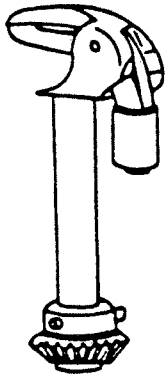
CAP ASSEMBLY



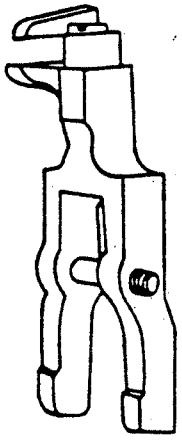
DRAWSLIDE CAM UPPER



STRIPPER

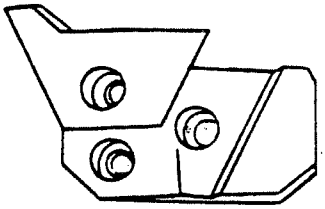


JAW ASSEMBLY

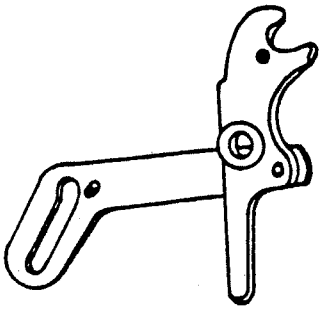


CLUTCH FORK ASSEMBLY

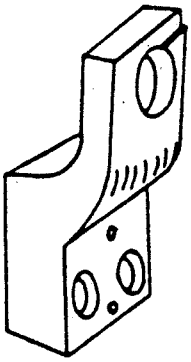
KNOTTER LEVER



KNOTTER HEAD CAM



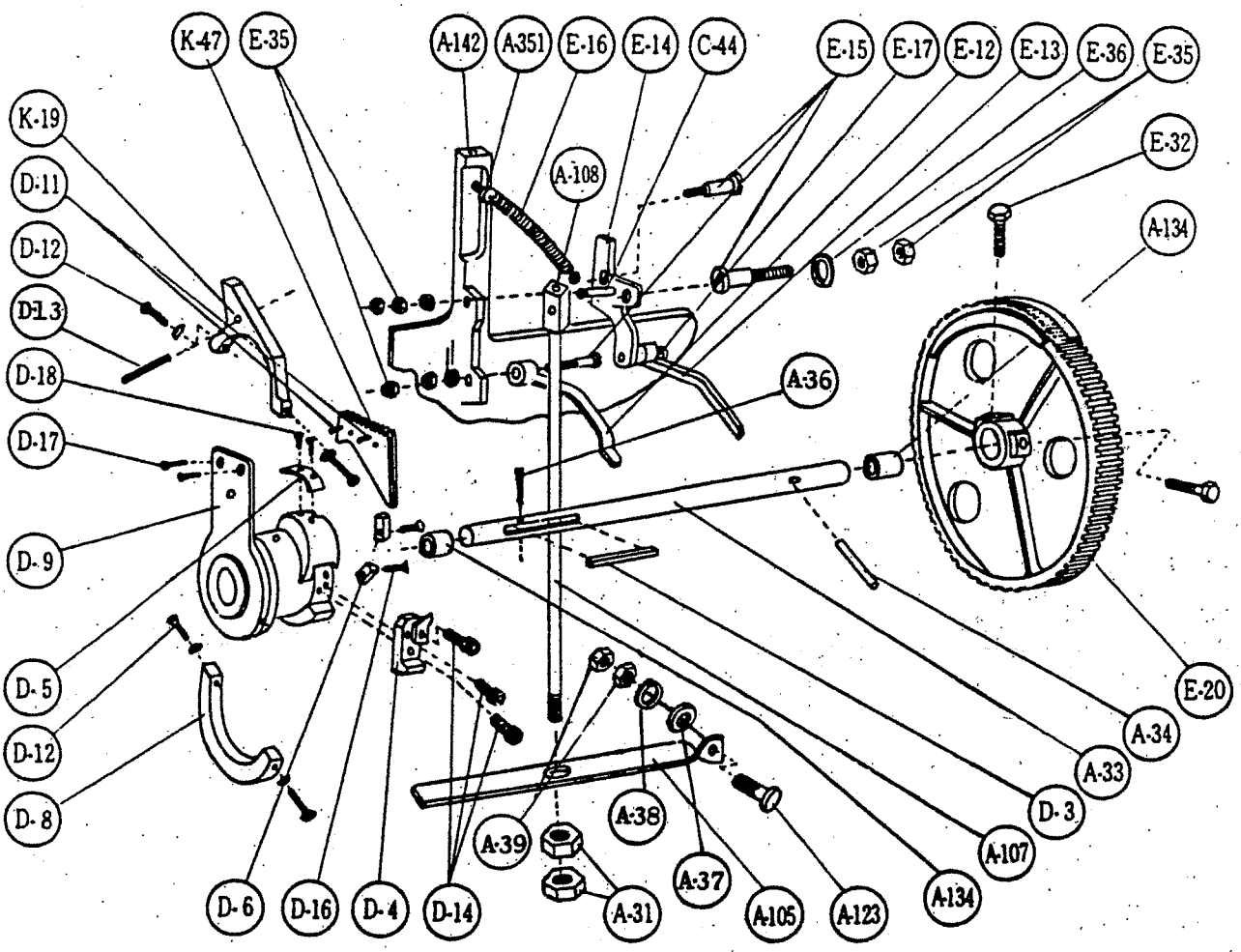
KNIFE HOLDER ASSEMBLY



BUTTON SUPPORT

FIG.26

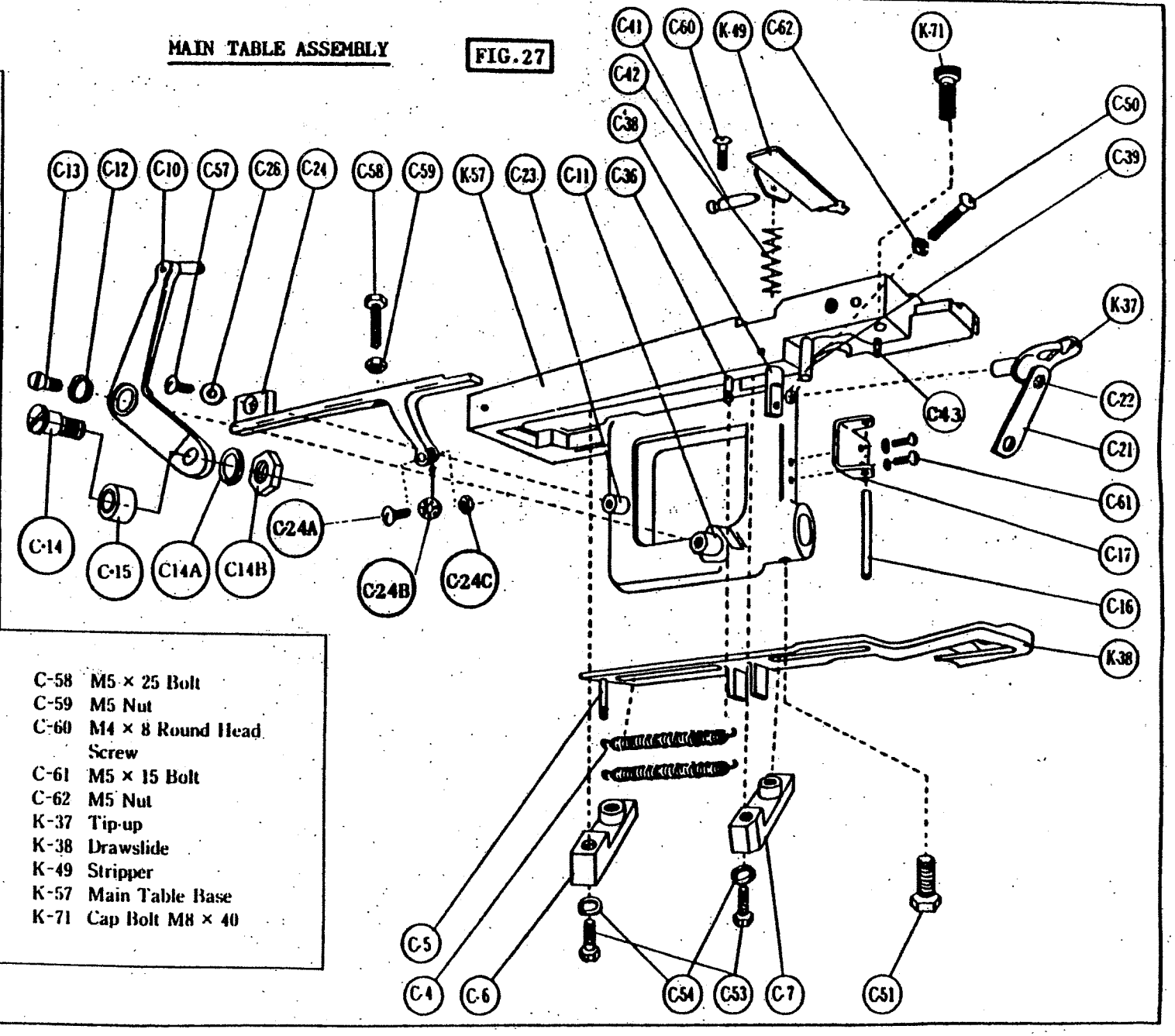
MAIN GEAR AND CAM WHEEL ASSEMBLY



A-31	M8 Nut
A-33	Main Shaft
A-34	Taper Pin
A-36	M6 × 70 Spring Pin
A-37	M8 Spring Washer
A-38	M8 Washer
A-39	M8 Nut
A-105	Pedal
A-107	Rod
A-108	Rod Top
A-123	Pedal Shaft
A-134	Ball Bearing
A-142	Side Frame (Left)
A-351	Spring Hanger
C-44	Spring Hanger
D-9	Cam Shell
D-3	Key
D-4	Knotter Head Cam
D-5	Cam Riser
D-6	Clutch Kickout
D-8	Drawslide Cam-lower
D-11	Knock Pin
D-12	M5 Cap Screw
D-13	M5 × 25 Fastener Pin
D-14	M5 × 20 Cap Screw
D-16	M5 × 20 Cap Screw
D-17	M6 × 20 Bolt
D-18	M5 × 15 Cap Screw
E-12	Clutch Lever
E-13	Clutch Kick Lever
E-14	Clutch Connecting Crank
E-15	Clutch Lever Pin
E-16	Spring
E-17	Stop Pin
E-20	Main Gear
E-32	M8 × 20 Bolt
E-35	M8 Nut
E-36	M8 Spring Washer
K-19	Drawslide Cam-upper
K-47	Knotter Rack

MAIN TABLE ASSEMBLY

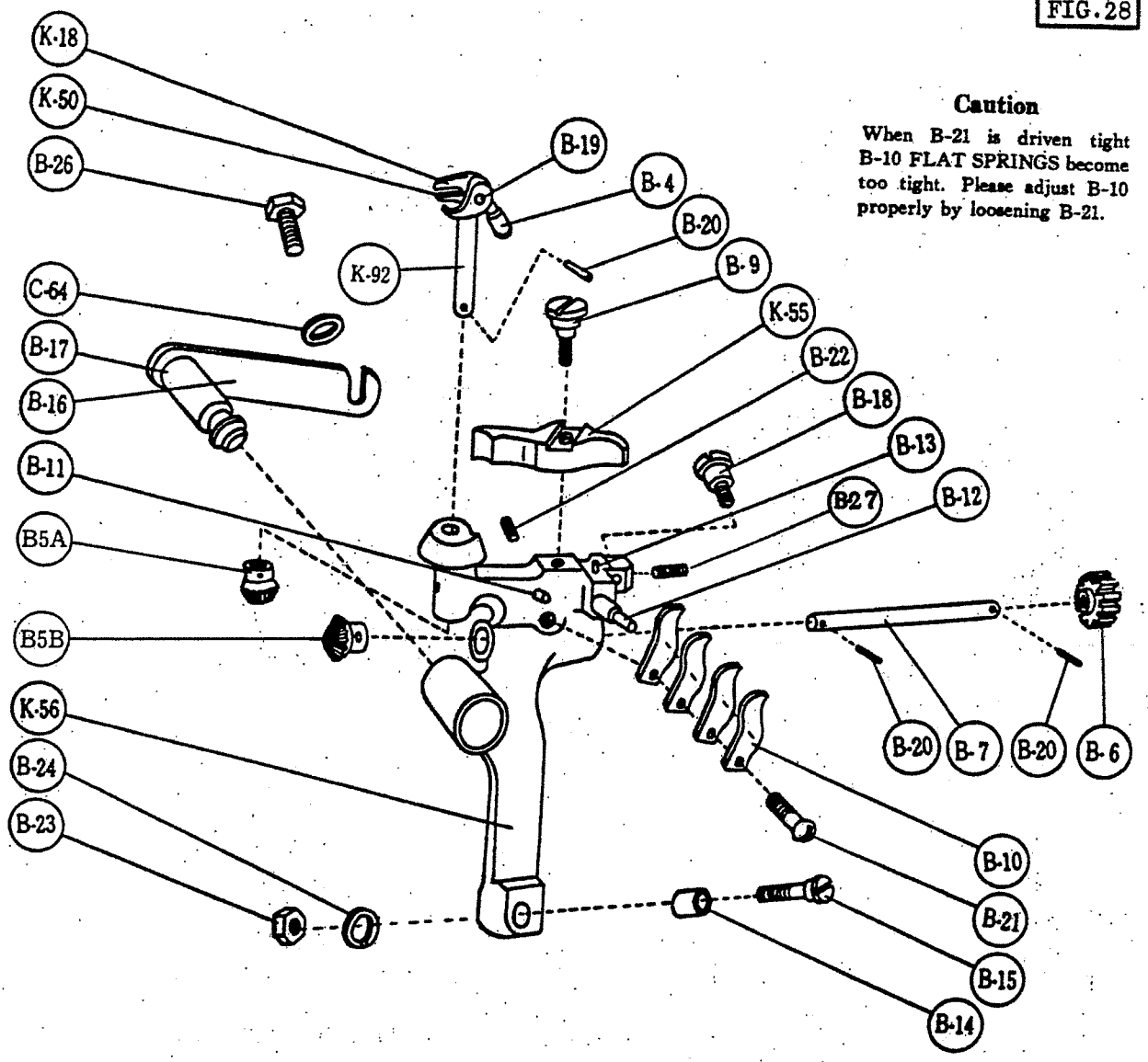
FIG. 27



C-4	Spring-Drawslide	C-58	M5 × 25 Bolt
C-5	Sprng Hanger	C-59	M5 Nut
C-6	Cap (A)	C-60	M4 × 8 Round Head Screw
C-7	Cap (B)	C-61	M5 × 15 Bolt
C-10	Arm	C-62	M5 Nut
C-11	Arm Shaft	K-37	Tip-up
C-12	2 × 5ϕ× 19 ϕ Washer	K-38	Drawslide
C-12A	M5 Spring Washer	K-49	Stripper
C-13	M5 × 10 Bolt	K-57	Main Table Base
C-14	Roller Shaft	K-71	Cap Bolt M8 × 40
C-14A	Spring Washer 8⅝		
C-14B	Nut 8⅝		
C-15	Roller		
C-16	Pin-Riser		
C-17	Guide-Riser Pin		
C-21	Tip-up Lever		
C-22	Self Locking Pin		
C-23	Self Locking Shaft		
C-24	Riser Lever		
C-24A	Small Shaft		
C-24B	Bearing (634)		
C-24C	M4 Nut		
C-28	Washer		
C-36	Spring Hanger		
C-38	Post		
C-39	M6 × 50 Screw		
C-41	Stop Pin		
C-42	Spring		
C-43	Knock Pin		
C-50	M5 × 25 Adjusting Cap Screw		
C-51	M8 × 15 Bolt		
C-53	M6 × 30 Bolt		
C-54	M6 Spring Washer		
C-57	M5 × 10 Bolt		

KNOTTER HEAD ASSEMBLY

FIG.28



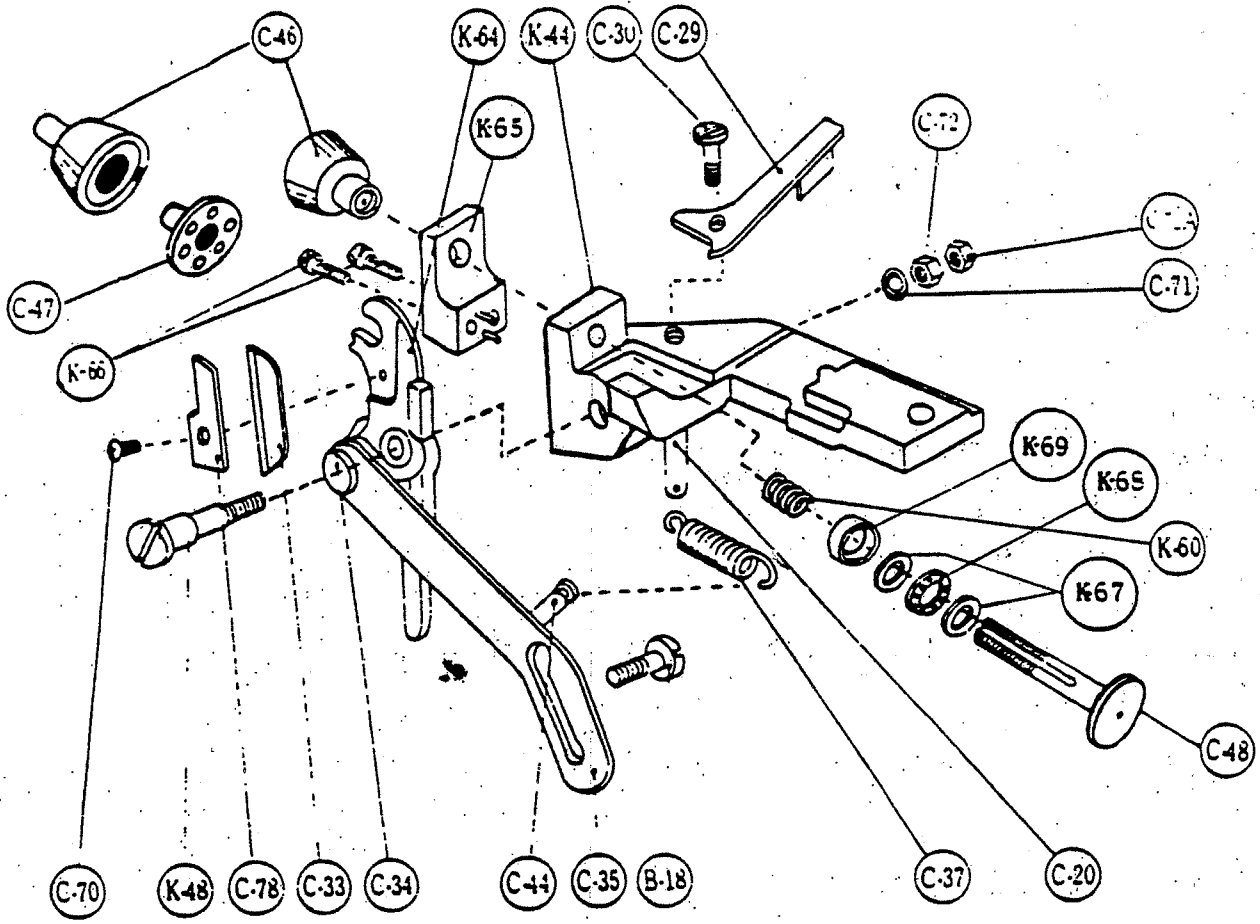
Caution

When B-21 is driven tight B-10 FLAT SPRINGS become too tight. Please adjust B-10 properly by loosening B-21.

B-4	Roller
B-5A	Bevel Gear (Knotter Side)
B-5B	Bevel Gear (Shaft Side)
B-6	Pinion Gear
B-7	Pinion Gear Shaft
B-9	Set Screw
B-10	Flat Spring
B-11	Holding Pin (3 × 11 Spring Pin)
B-12	Connecting Pin
B-13	Holding Pin
B-14	Roller
B-15	Roller Shaft
B-16/B-17	Knotter Head Shaft w/stay
B-18	Screw
B-19	Pin
B-20	M3 × 18 Spring pin
B-21	M5 × 25 Bolt
B-22	M6 × 6 Screw
B-23	M8 Nut
B-24	M8 Spring Washer
B-26	M8 × 25 Bolt
C-64	M8 Washer
K-56	Knotter Head
K-55	Knotter Lever
K-18	Knotter-Jaw upper
K-50	Knotter-Jaw lower
B-27	M6 × 6 Screw
K-92	Knotter Jaw Assembly (K18/K50/B19/B4)

STRINGHOLDER ASSEMBLY

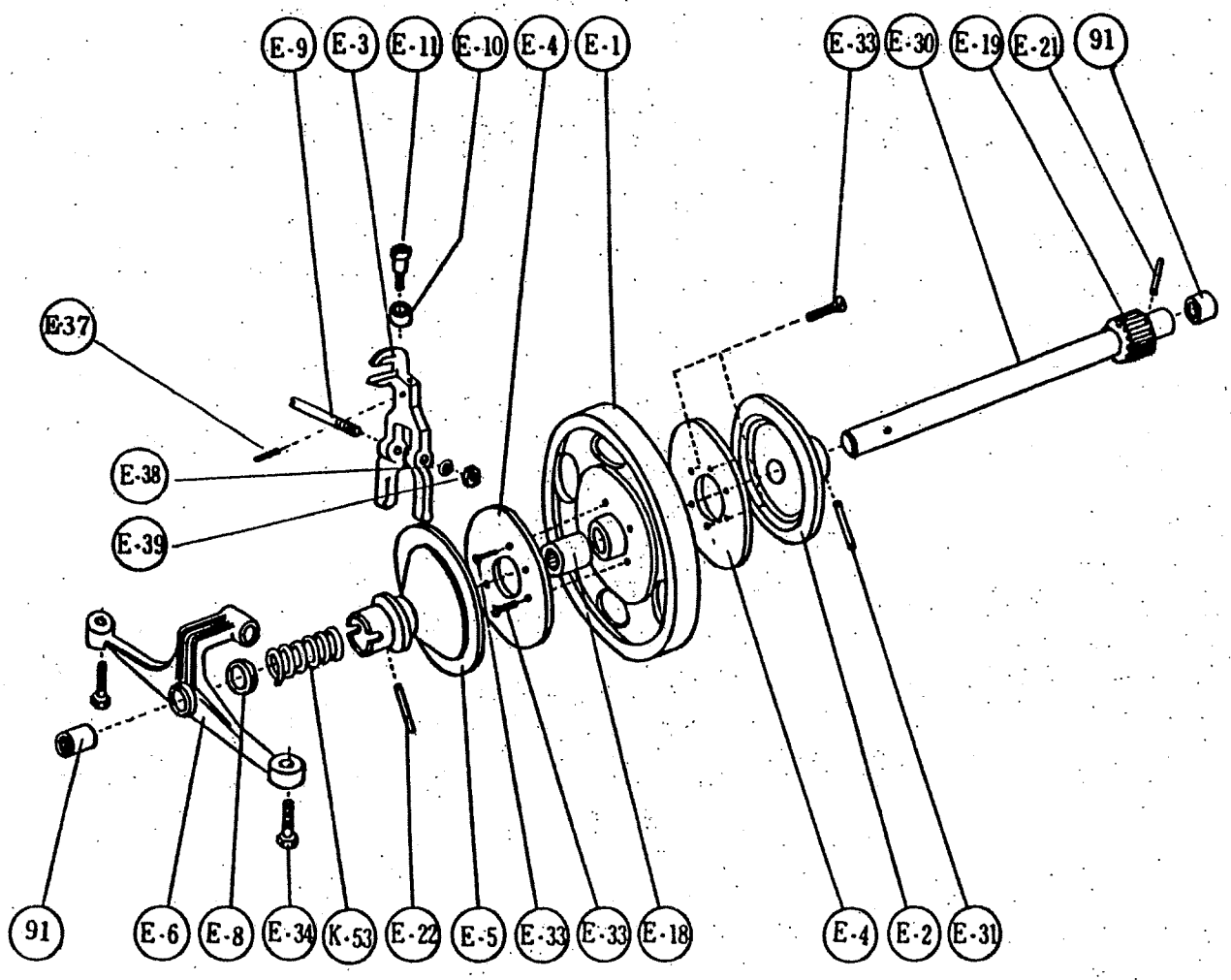
FIG.29



B-18	Screw	C-48	Button Shaft
C-20	Spring Hanger	C-70	M4 x 6 Screw
C-29	Button Lever	C-71	6ø Spring Washer
C-30	Lever Stop Screw	C-72	6ø Nut
C-33	Knife	C-72A	U nut 6mm
C-34	Self Locking Shaft	C-78	Knife Keeper
C-35	Connecting Bar	K-44	Stringholder Base
C-37	Spring	K-48	Screw
C-44	Spring Hanger	K-60	Spring
K-64	Knife Holder	K-65	Button Support
C-46	Button	K-66	M5 x 25 Cap Screw
C-47	Button Nut	K-67	Washer
		K-68	Bearing
		K-69	Bearing Cap

CLUTCH PULLEY ASSEMBLY

FIG.30



E-1 Clutch Pulley
E-2 Clutch Member
E-3 Clutch Fork
E-4 Friction Disk
E-5 Clutch Member

E-6 Step
E-8 Collar
E-9 Clutch Fork Pin
E-10 Roller
E-11 Roller Set Screw

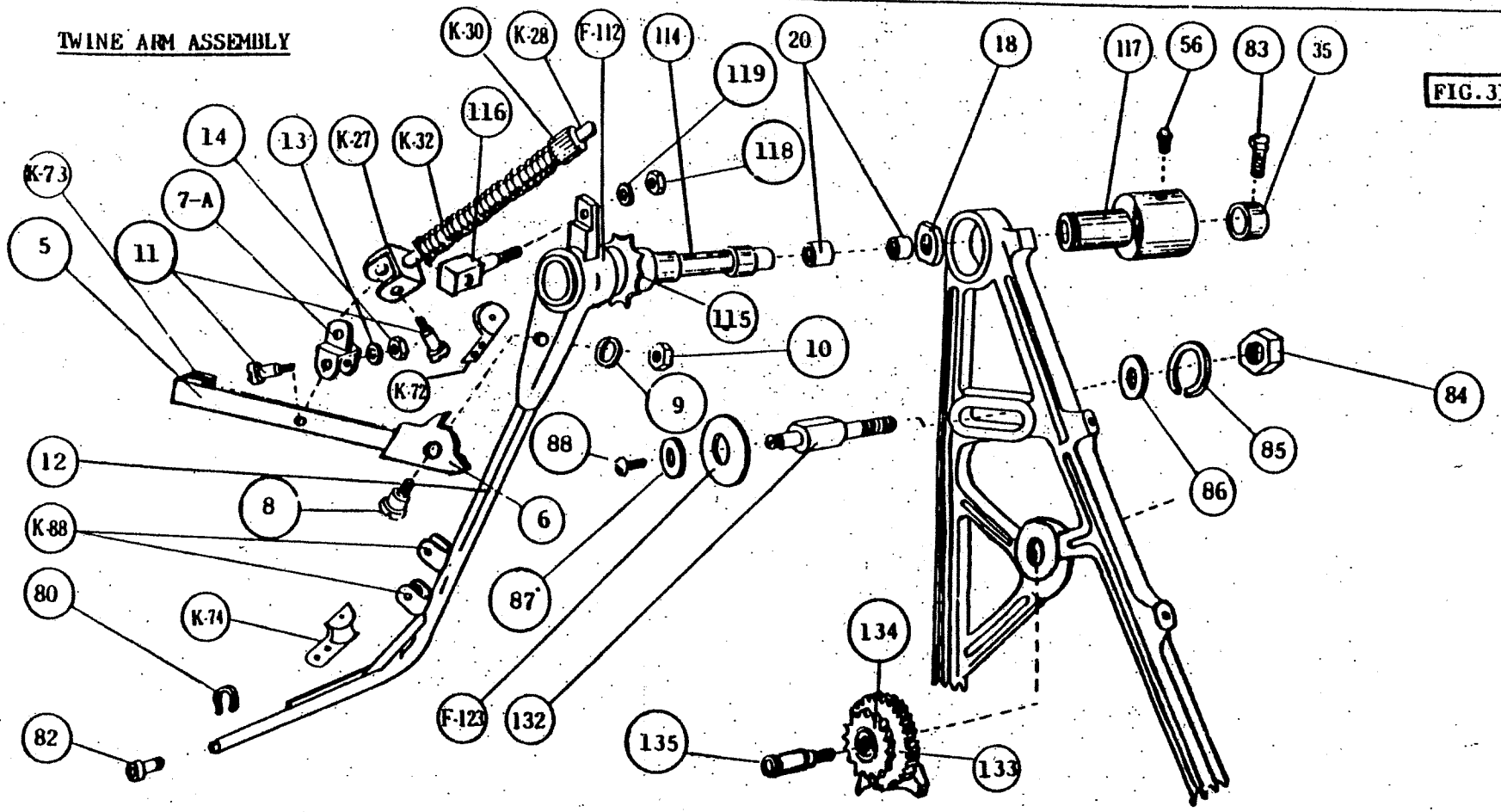
E-18 Needle Bearing
E-19 Pinion Gear
E-21 Taper Pin
E-22 Taper Pin
E-30 Shaft

E-31 5ø x 50 Taper Pin
E-33 M5 x 10 Screw
E-34 M8 x 45 Bolt
E-37 M6 x 6 Screw
E-38 M6 Washer
E-39 M6 Nut

K-53 Spring
91 Ball Bearing

TWINE ARM ASSEMBLY

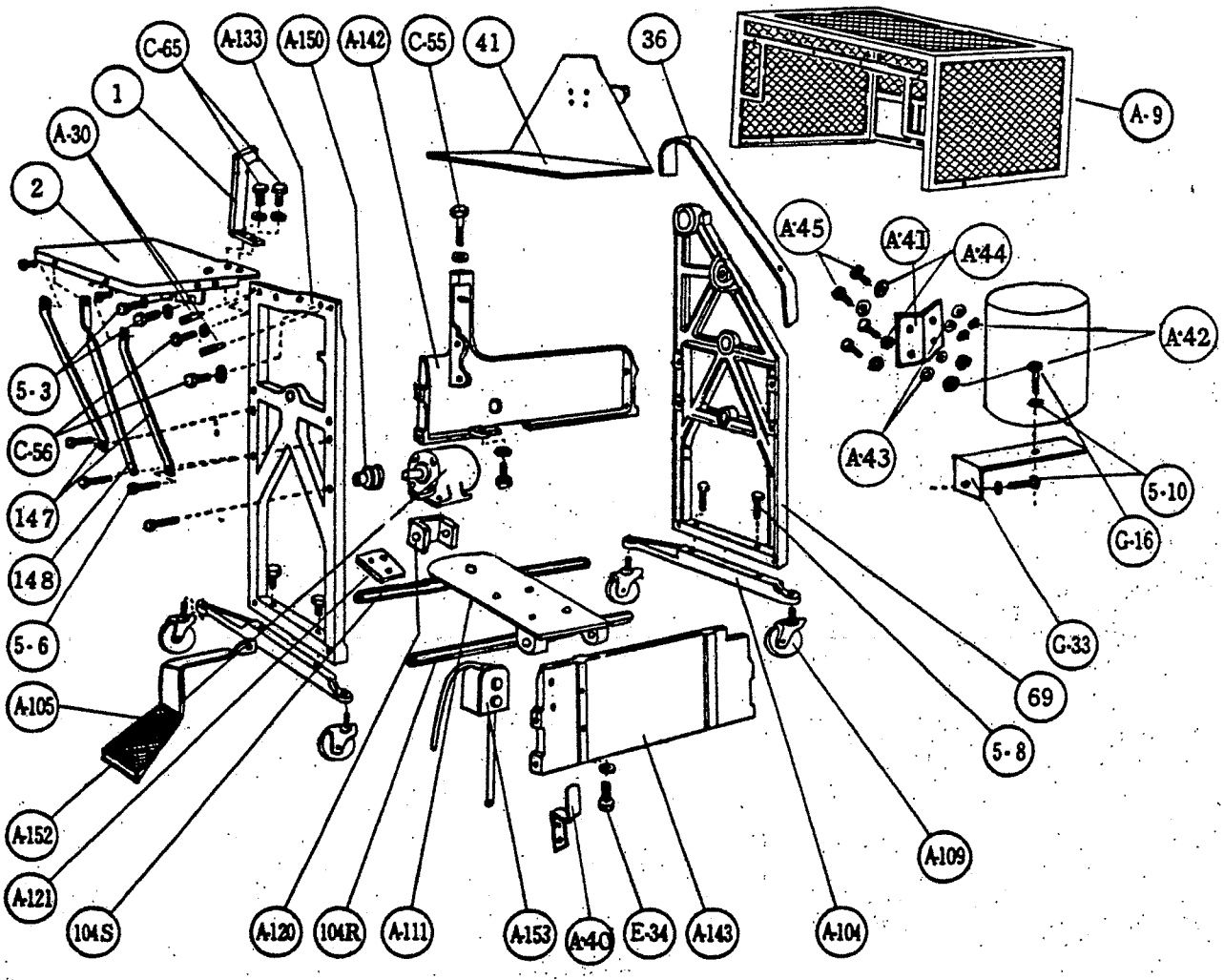
FIG. 31



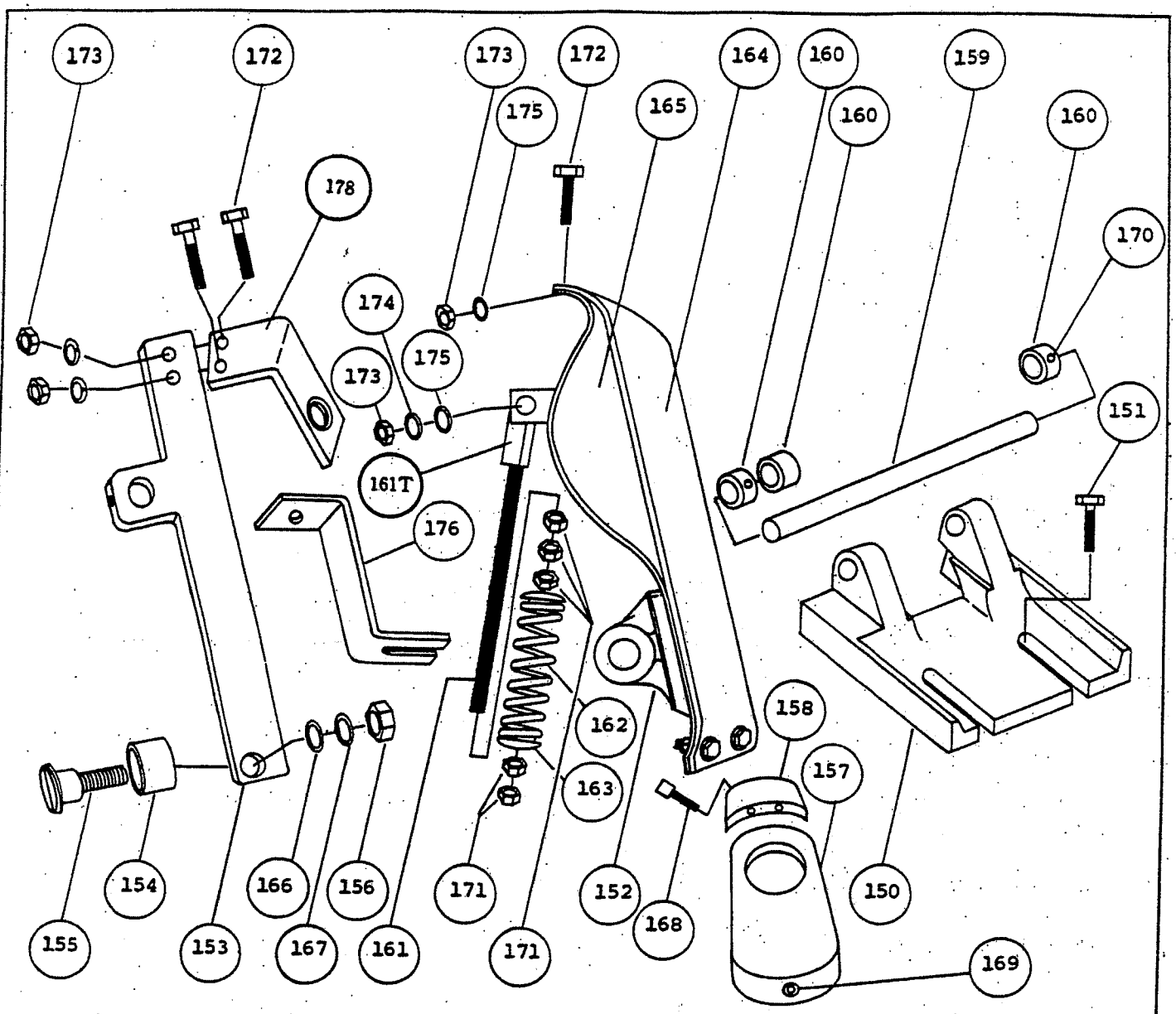
5	Drawback Lever	18	Nut	87	M6 Flat Washer	K-27	Connecting (B)
6	Drawback Lever Base	20	Needle Bearing	88	M5×10 Screw	K-28	Tension Bar
7-A	Connecting (A)	35	Collar	114	Twine Arm Shaft	K-30	Adjusting Nut
8	Screw for Drawback Lever	56	Grease Nipple	115	Sprocket	K-32	Tension Spring
9	8φ Washer	80	Twine Guide	116	Tension Guide	K-72	Guide Roller
10	M8 Nut	82	Twine Arm Bush	117	Bearing Case	K-73	Tension Roller
11	Connecting Bolt	83	Screw	118	M6 Nut	K-74	Corner Roller
12	Twine Arm Assembly	84	M12 Nut	119	M6 Flat Washer	K-88	Arm Roller
13	6φ Washer	85	12⅝ Spring Washer	132	Idler Shaft	F-112	Twine Arm Casting
14	M6 Nut	86	12⅝ Flat Washer	133-134	Small Gear Assembly	F-123	Tension Roller for Chain
				135	Small Gear Shaft	61	Chain

FRAME ASSEMBLY

FIG.32

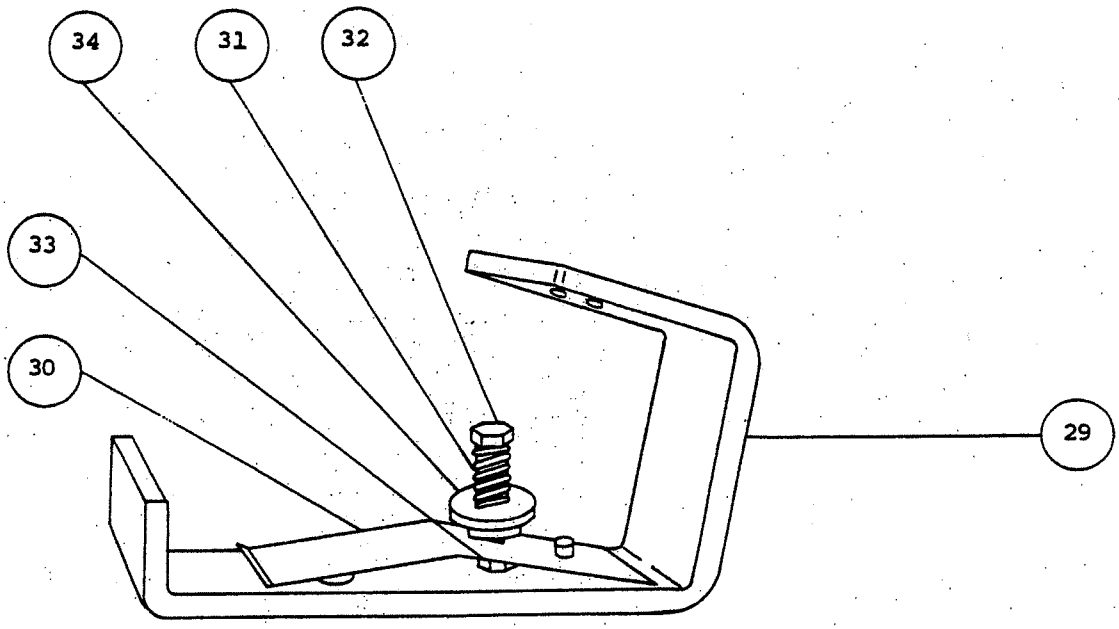


A-9	Guard	C-55	M8 x 45 Bolt
A-30	Fastener Pin	C-56	M8 x 30 Bolt
A-40	Cord Hanger	C-65	M6 x 20 Bolt
A-41	Twine Can Bracket	E-34	M8 x 45 Bolt
A-42	M5 Nut	G-16	Twine Can
A-43	M5 Spring Washer	G-33	Twine Can Stand
A-44	M5 Flat Washer	1	Vertical Standard
A-45	M5 x 10 Round Head Screw	2	Solid Table
A-104	Frame Stand	36	Chain Cover
A-105	Foot Pedal	41	Loose Table Assembly
A-109	Caster	69	Rear Frame
A-111	Motor Base	104S	Square Stay
A-120	Motor Base Bracket	104R	Round Stay
A-121	Rod Guide	147	Table Supporter
A-133	Front Frame	148	Table Supporter
A-150	Motor Pulley	5-3	M8 x 20 Bolt
A-152	Motor	5-6	M8 x 45 Bolt
A-153	Switch	5-8	M10 x 50 Bolt
A-142/143	Side Frame	5-10	M6 x 15 Bolt



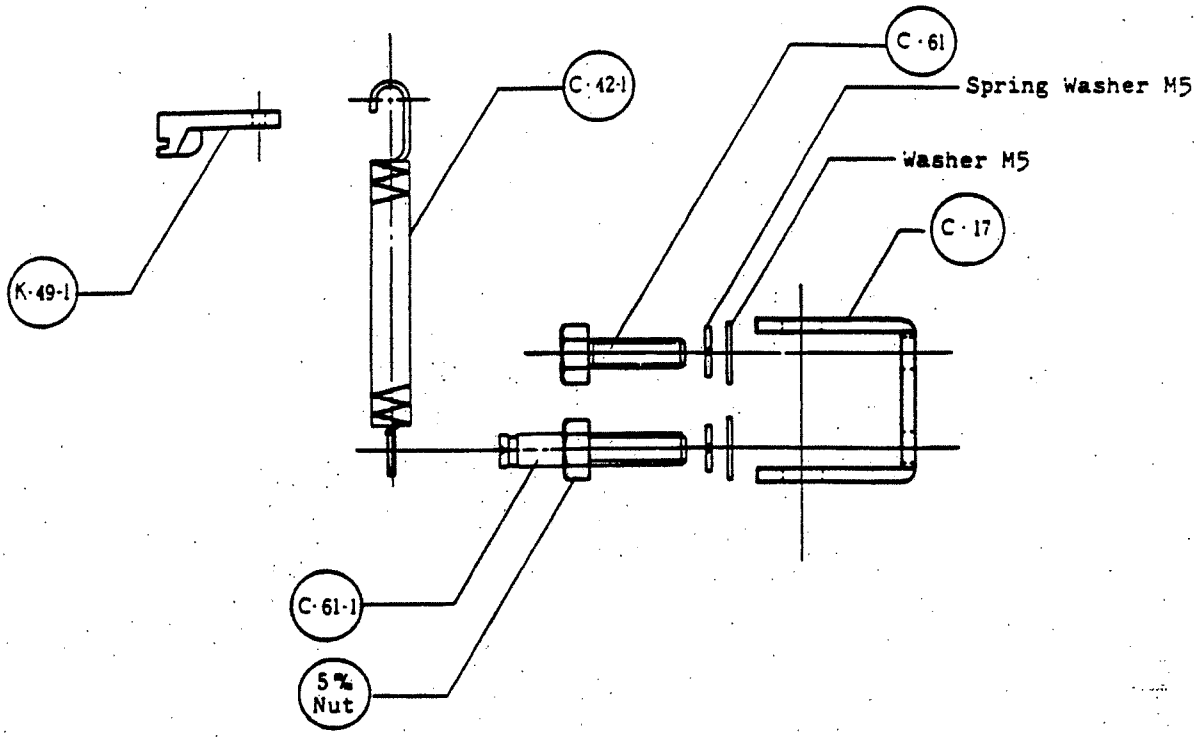
BRAKE ASSEMBLY
(MODEL 30 - 60)

Part No.	Description	Part No.	Description
150	Brake Casting	164	Leather
151	M8 × 20 Bolt	165	Sponge
152	Brake Pad Supporter	166	8ø Flat Washer
153	Brake Lever	167	8ø Spring Washer
154	Roller-Brake Lever	168	M5 × 15 Cap Screw
155	Screw	169	M5 × 20 Cap Screw
156	M8 Nut	170	M6 × 6 Set Screw
157	Brake Cam	171	M10 Nut
158	Brake Cam	172	M6 × 20 Bolt
159	Pivot	173	M6 Nut
160	Coller	174	6ø Washer
161	Rod	175	6ø Spring Washer
161T	Rod Top	176	Brake Lever Guide
162	Brake Spring	178	Brake L
163	Spring Receipt		



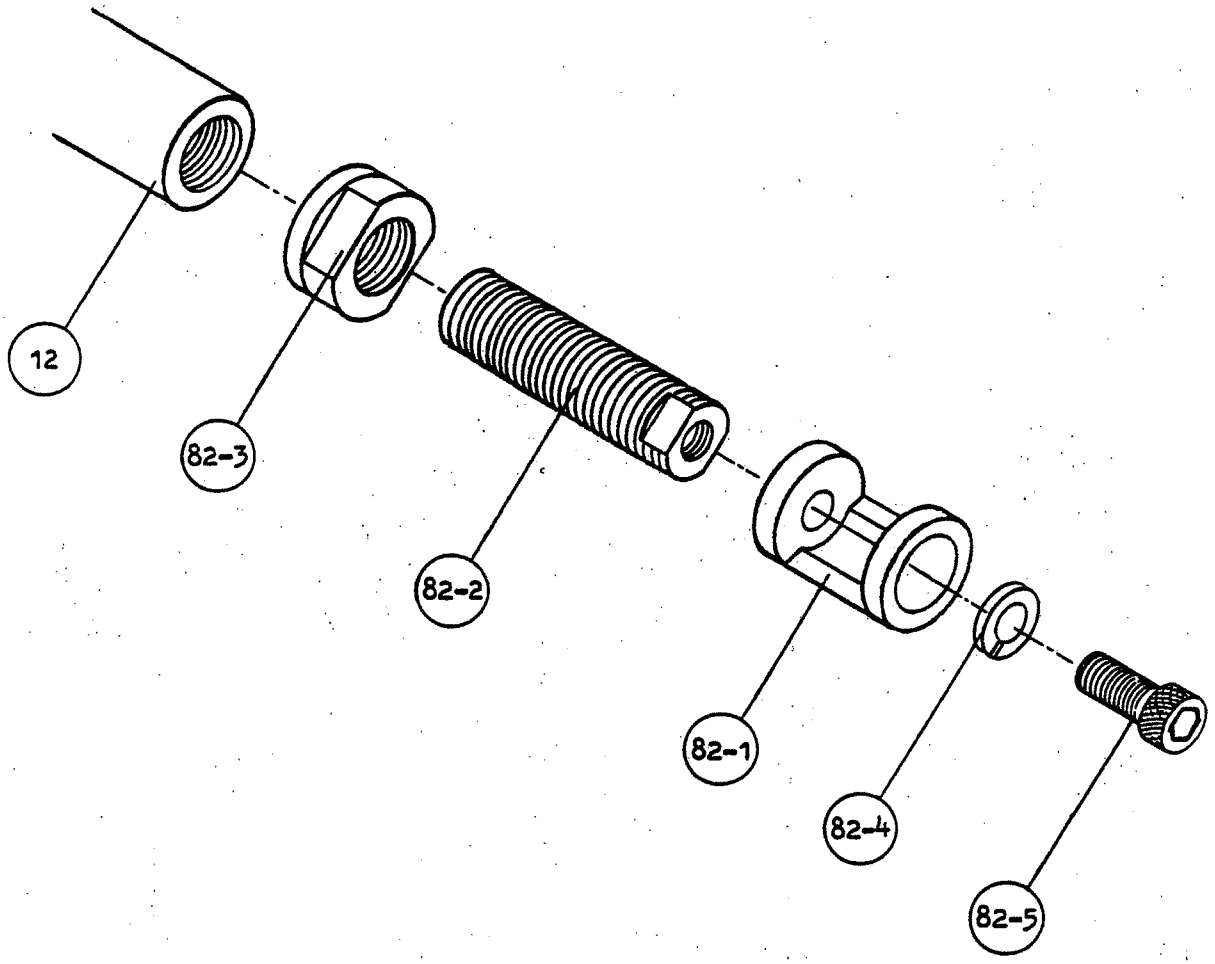
TENSIONING DEVICE

Part No.	Description
29	Rear Tension Frame
30	Flat Spring
31	Coil Spring
32	M6 x 40 Bolt
33	M6 Nut
34	M6 Adjusting Nut



Modified in April, 1979

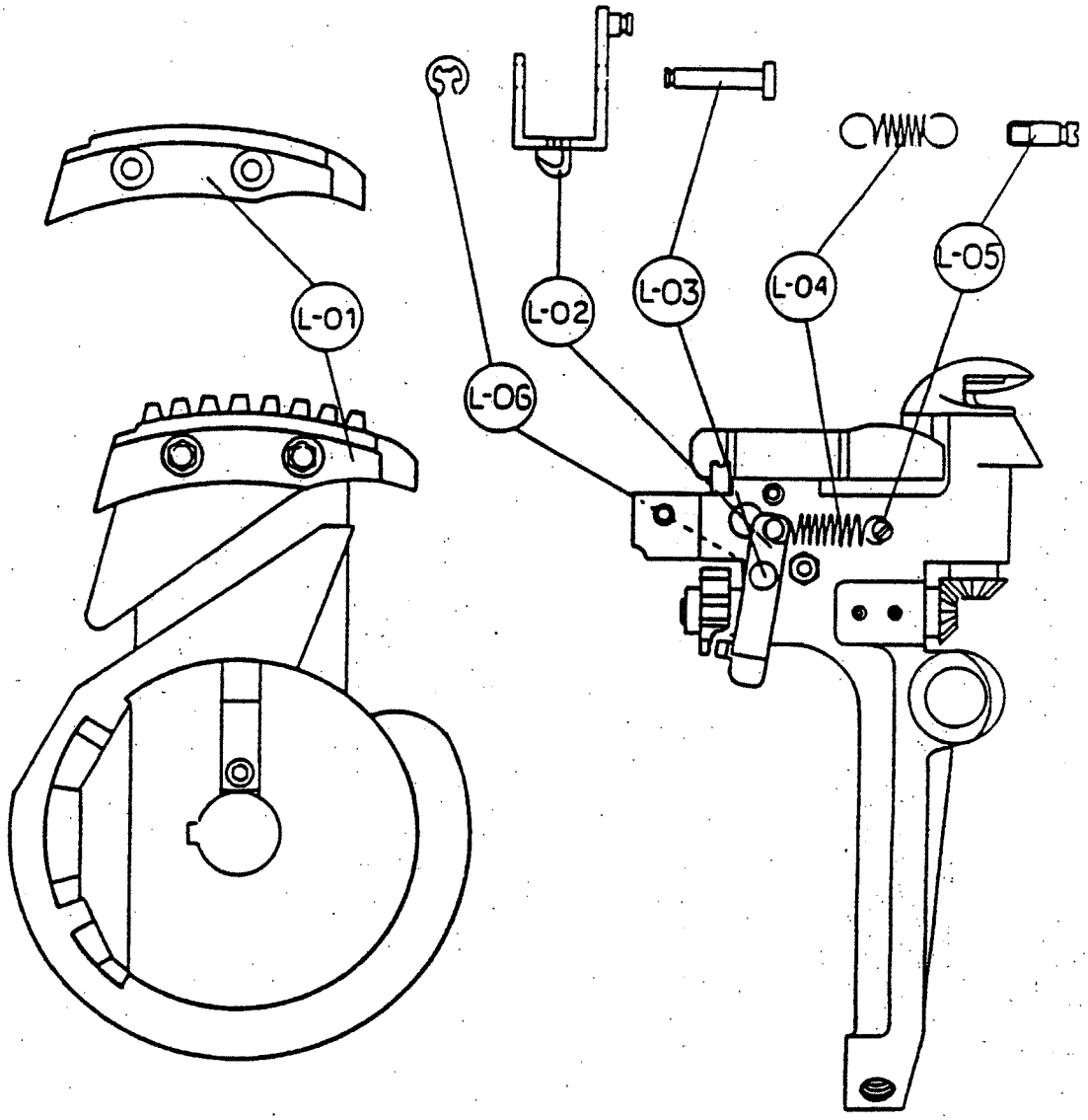
K · 49-AA	Stripper (new)
C · 42-1	Spring (new)
C · 61	Bolt M5x15
C · 61-A	Spring Hanger
C · 17	Guide



Modified in October, 1983

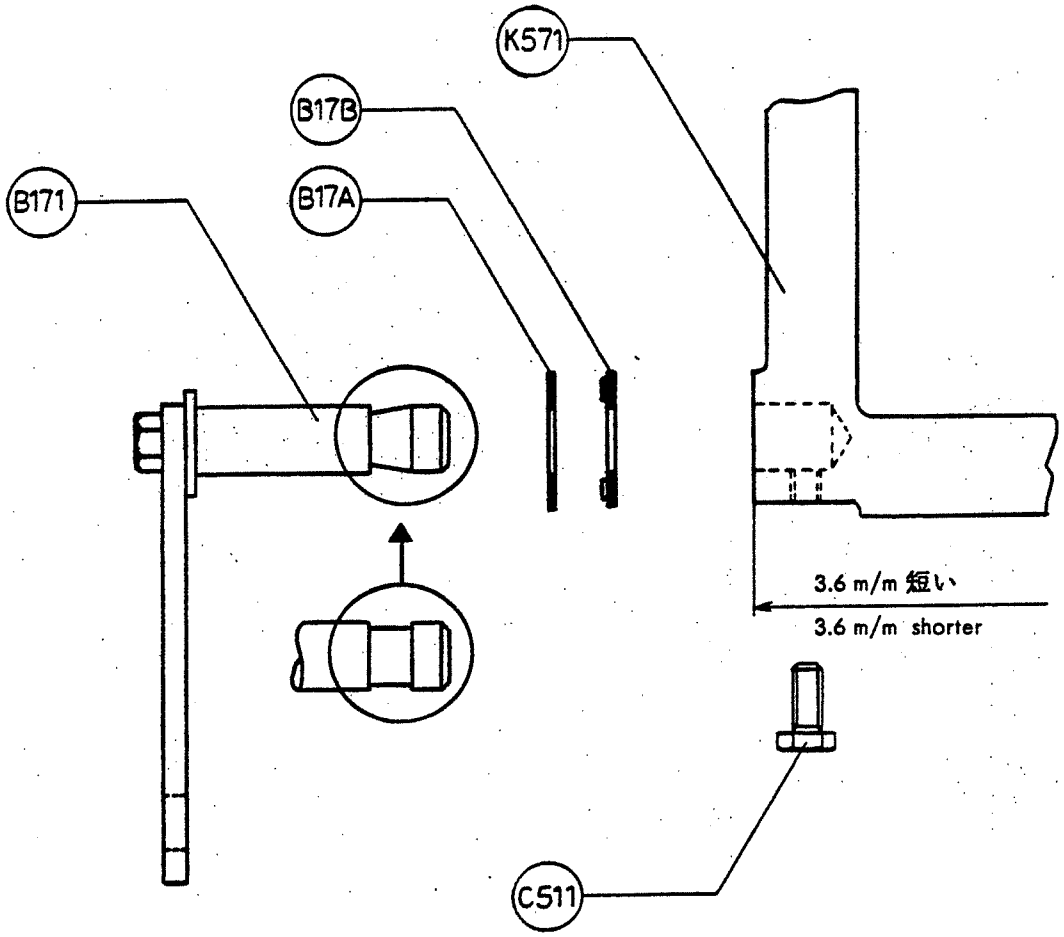
82-1	Arm Top
82-2	Arm Adjuster
82-3	Adjuster Nut
82-4	Spring Washer M5
82-5	Cap Screw M5x15

KNOTTER JAW LOCKING DEVICE



Equipped in January, 1979

L-01	Locking Cam
L-02	Pinion Gear Lock
L-03	Pivot
L-04	Locking Spring
L-05	Spring Hanger
L-06	Stop Ring



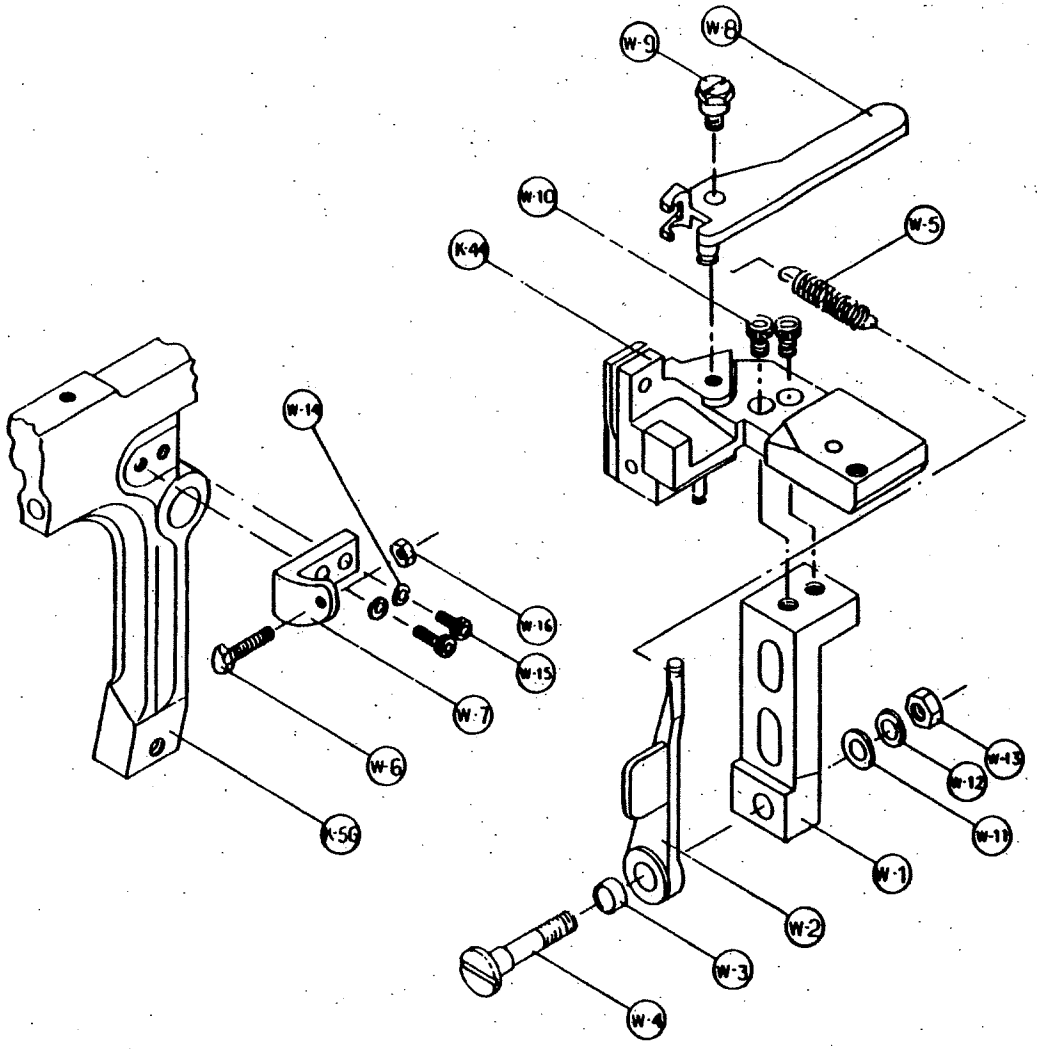
昭和59年10月より変更

K571	取 付 台 (新)	従来のK-57より3.6mm 短い
B171	ﾉｯﾀｰﾍｯﾄﾞ 軸	図の様に角度をつける
B17A	ﾍﾞｱﾘﾝｸﾞﾚｰｽ	追加
B17B	ﾍﾞｱﾘﾝｸﾞ	追加
C511	8X20 ﾎﾞｰﾙﾄ	加工後熱処理

Modified in October, 1984

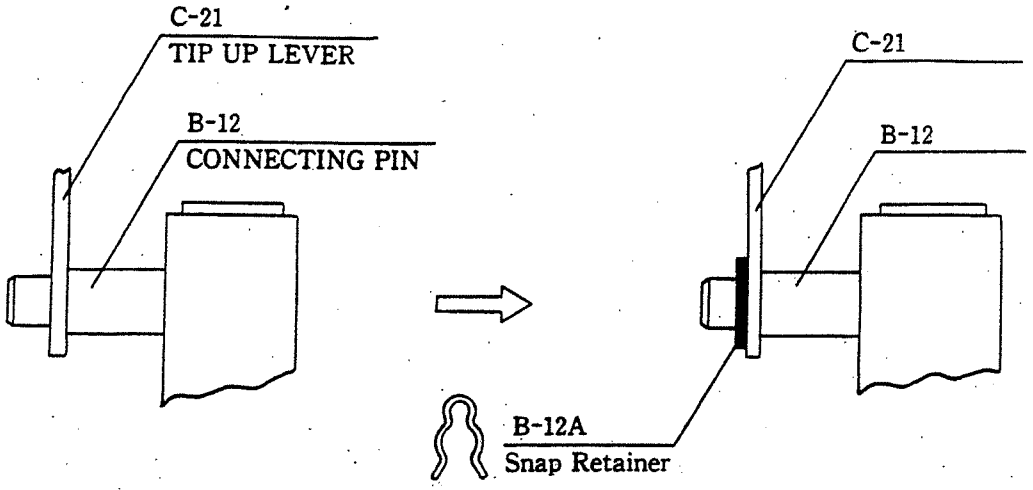
K571	Main Table Base (New)	3.6mm shorter than former K57
B171	Knotter Head Shaft (New)	make an angle as above figure shows
B17A	Bearing Race	addition
B17B	Bearing	addition
C511	8X20 Bolt	Hardened with heat treatment

DUAL TENSIONING BUTTON DEVICE

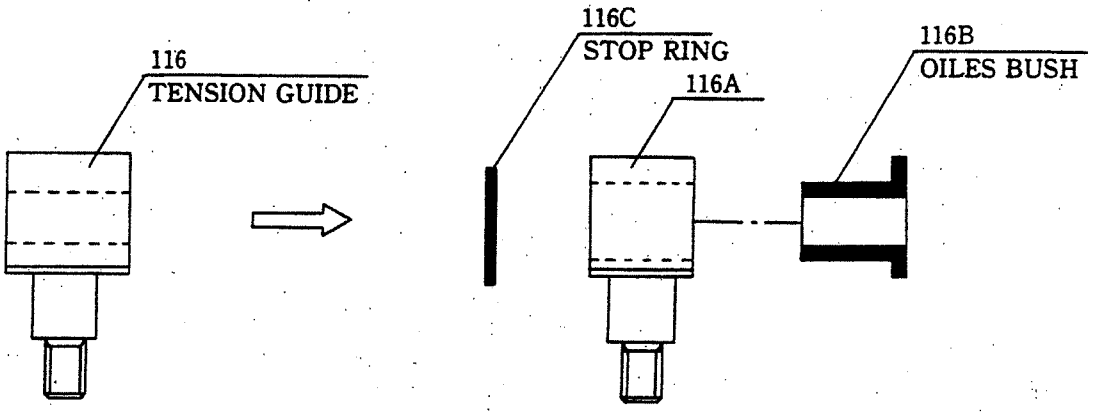


W-1	Dual Tension Bracket
W-2	Dual Tension Lever
W-3	Oiles
W-4	Dual Tension Lever Pin
W-5	Dual Tension Spring
W-6	Dual Tension Adjuster
W-7	Dual Tension Arm
W-8	Button Lever
W-9	Screw
W-10	Cap Screw M6x20
W-11	Flat Washer M8
W-12	Spring Washer M8
W-13	Nut M8
W-14	Spring Washer M5
W-15	Cap Screw M5x15
W-16	Nut M5
K-44	Stringholder Base
K-56	Knotter Head

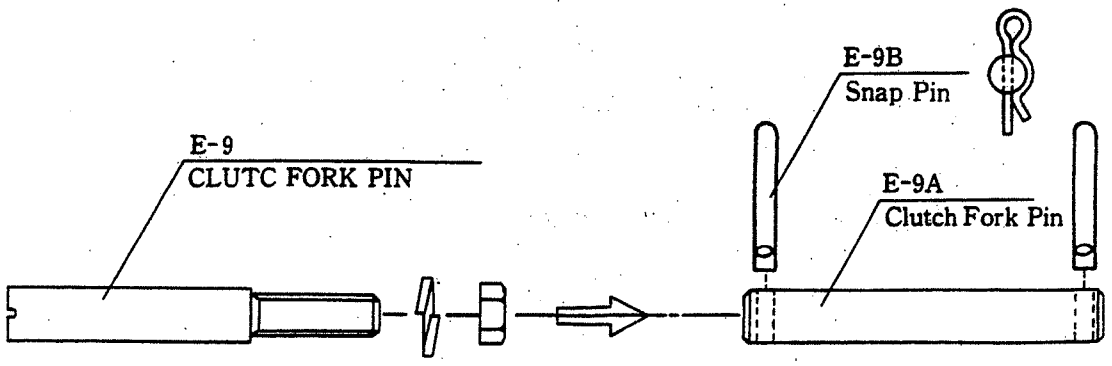
Since Nov.'85, Stop Ring has been put on the B-12 Connecting Pin to prevent the C-21 Tip Up Lever from getting out of its place.



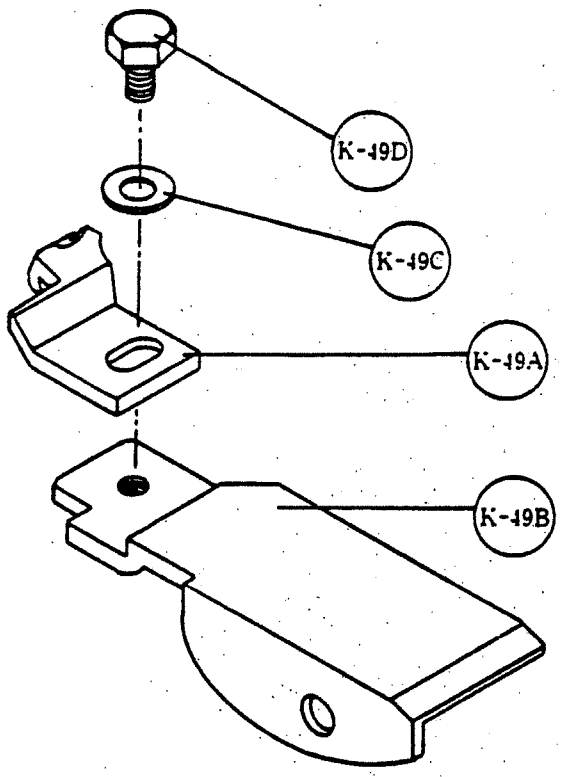
Since Dec.'85, Oiles Bush has been set in the 116 Tension Guide.



Since Mar.'85, the E-9 Clutch Fork Pin has been fixed by Pin instead of Nut as follows.



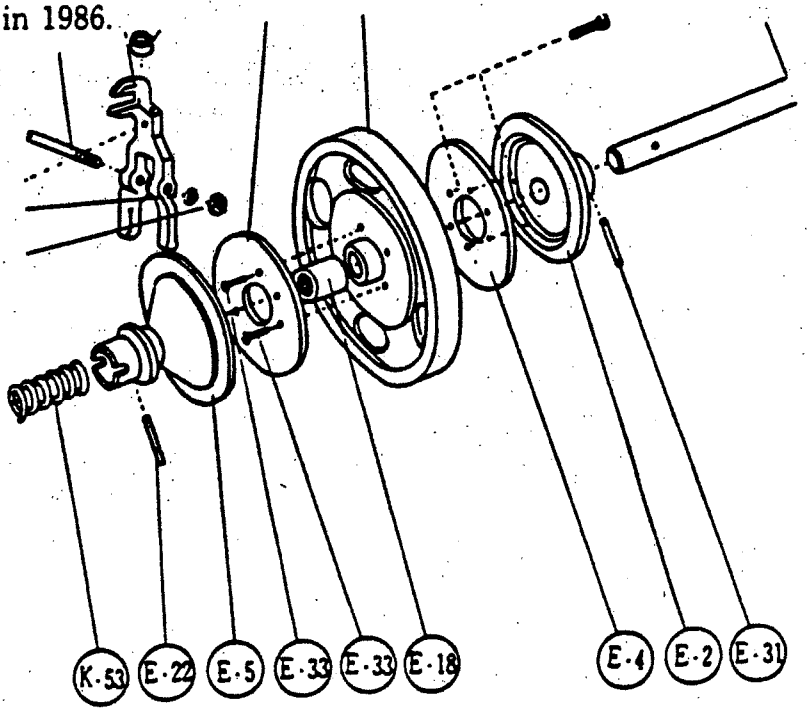
STRIPPER
MODIFIED IN NOVEMBER 1986



K-49A	Stripper Tip
K-49B	Stripper Base
K-49C	Washer
K-49D	Bolt

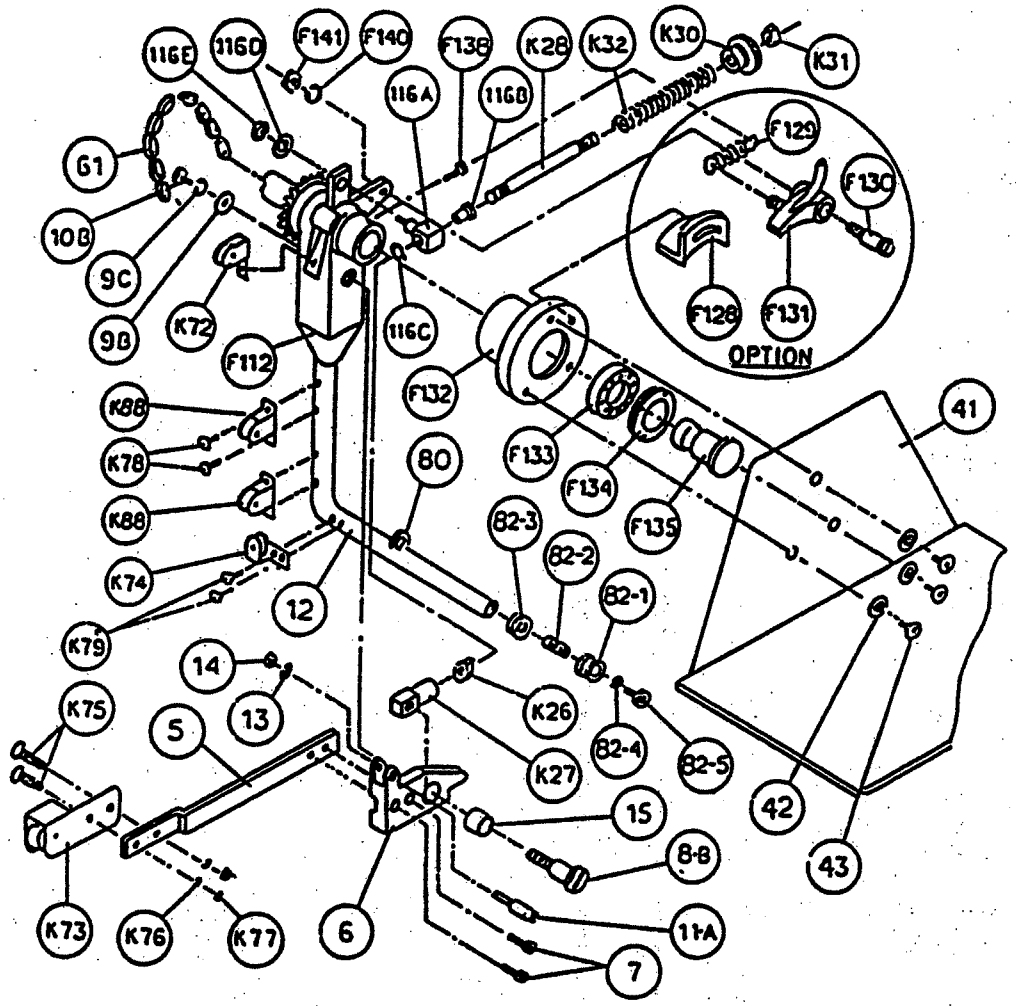
Notice: Attach the top of the Stripper Tip (K-49A) close to the side face of Knotter Jaw, making a right angle with the Knotter Jaw and drive the Bolt (K-49D) tight.

Regarding the E-22 Taper Pin 5 x 50 and the E-31 Taper Pin 5 x 50, please note that they have been changed in size to 6 x 50 since March in 1986.



TWINE ARM, LOOSE TABLE ASSEMBLY

MODEL 20—60

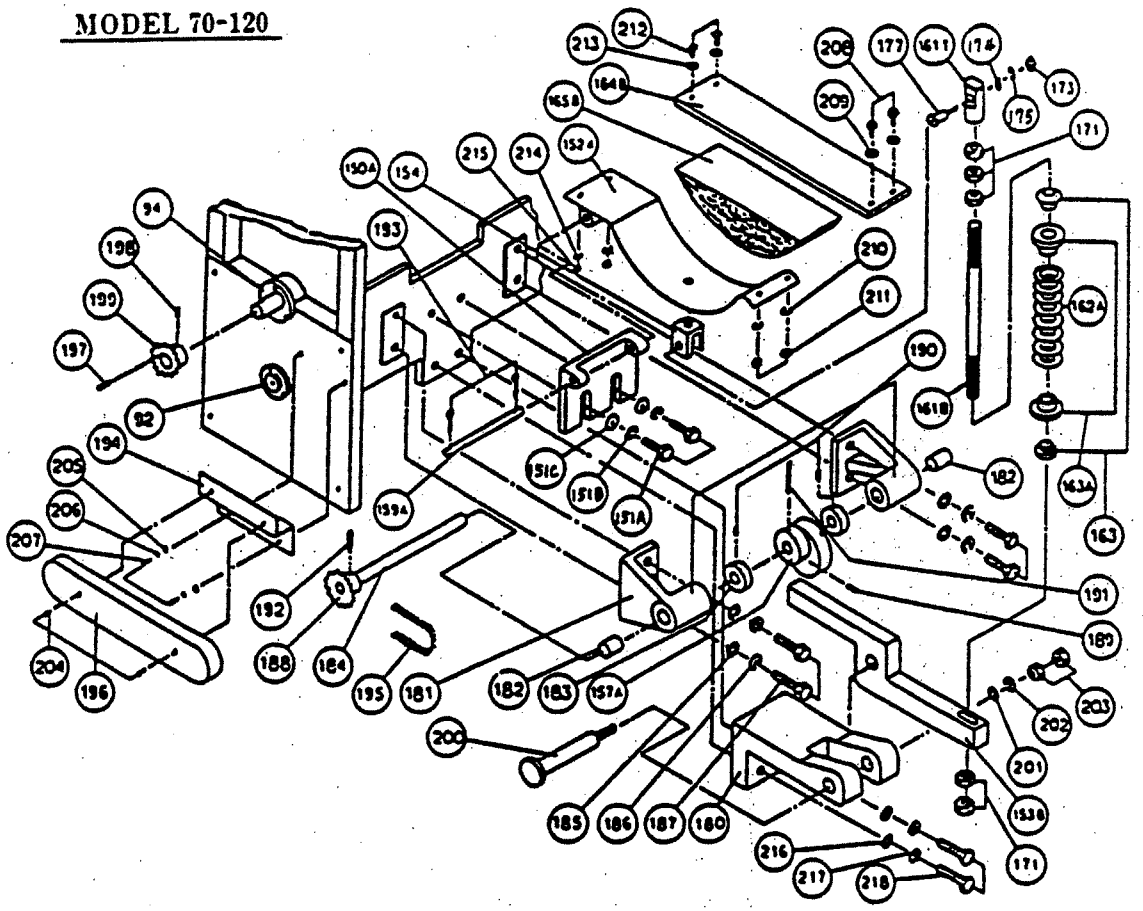


Parts marked with • have different sizes suitable for different models.

5	Drawback Lever •	82-5	Cap Screw M5x15	K30	Adjusting Nut
6	Drawback Lever Base	116A	Tension Guide	K31	U Nut M8
7	Cap Screw M5x10	116B	Oiles Bush	K32	Tension Spring •
8B	Screw for No.6	116C	Stop Ring	K72	Guide Roller
9B	Washer 2tx5x19	116D	Washer M6 (large)	K73	Tesion Roller
9C	Spring Washer M5	116E	Nut M6	K74	Corner Roller
10B	Bolt M5x10	F112	Twine Arm Casting	K75	Screw (oval countersu nk head)
11A	Connecting Screw	F128	Table Stop Cam		
12	Arm •	F129	Spring	K76	Spring Washer M4
13	Spring Washer M6	F130	Screw	K77	Nut M4
14	Nut M6	F131	Swing Stopper	K78	Screw (pan head)
15	Oiles	F132	Bearing Case	K79	Screw (oval counter sunk head)
41	Loose Table •	F133	Bearing		
42	Washer	F134	Nut	K88	Arm Roller
43	Screw M6x15	F135	Shaft		
61	Chain •	F138	Cap Screw M6x20		
80	Twine Guide	F140	Spring Washer M8		
82-1	Arm Top	F141	Nut M8		
82-2	Arm Adjuster	K26	Nut M8		
82-3	Adjuster Nut	K27	Connecting		
82-4	Spring Washer M5	K28	Tension Lod •		

BRAKE ASSEMBLY

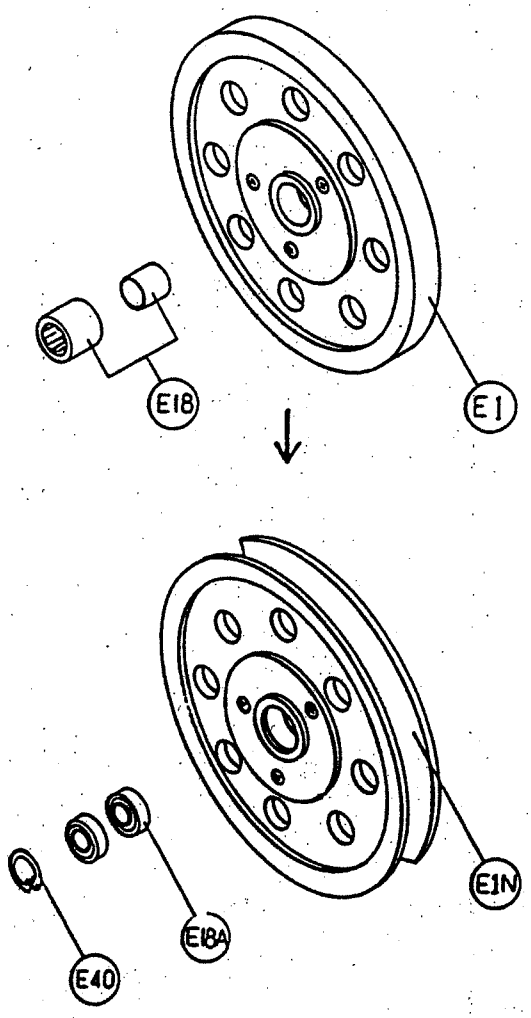
MODEL 70-120



92	Bearing Cover (Small)	181	Brake Metal	205	Washer M6
94	Bearing Cover (Hole)	182	Oiles	206	Spring Washer M6
150A	Brake Casting	183	Collar	207	Bolt M6x15
151A	Bolt M8x25	184	Brake Shaft	208	Bolt M6x20
151B	Spring Washer M8	185	Flat Washer M8	209	Large Washer M6
151C	Special Washer M8	186	Spring Washer M8	210	Spring Washer M6
152A	Brake Pad Supporter	187	Bolt M8x25	211	Nut M6
153B	Brake Lever	188	Sprocket	212	Bolt M6x15
154	Self-locking Joint	189	Set Screw M6x6	213	Large Washer M6
157A	Brake Cam	190	Set Screw M6x6	214	Spring Washer M6
159A	Pivot	191	Spring Pin 5mm x 35	215	Nut M6
161B	Brake Rod	192	Taper Pin 5mm x 35	216	Washer M10
161T	Brake Rod Top	193	Split Pin 2mm x 18	217	Spring Washer M10
162A	Brake Spring	194	Chain Cover Supporter	218	Bolt M10x35
163	Spring Receipt	195	Brake Chain		
163A	Spring Receipt	196	Chain Cover		
164B	Leather	197	Set Screw M6x10		
165B	Sponge	198	Set Screw M6x10		
171	Nut M10	199	Sprocket		
173	Nut M6	200	Brake Lever Shaft		
174	Washer M6	201	Special Washer M8		
175	Spring Washer M6	202	Spring Washer M8		
177	Brake Rod Top Screw	203	Nut M8		
180	Brake Bracket	204	Screw M4x8		

Note
Since August in 1986, parts numbers 152A, 153B, 164B and 165B have been the same for Models 70 - 120.

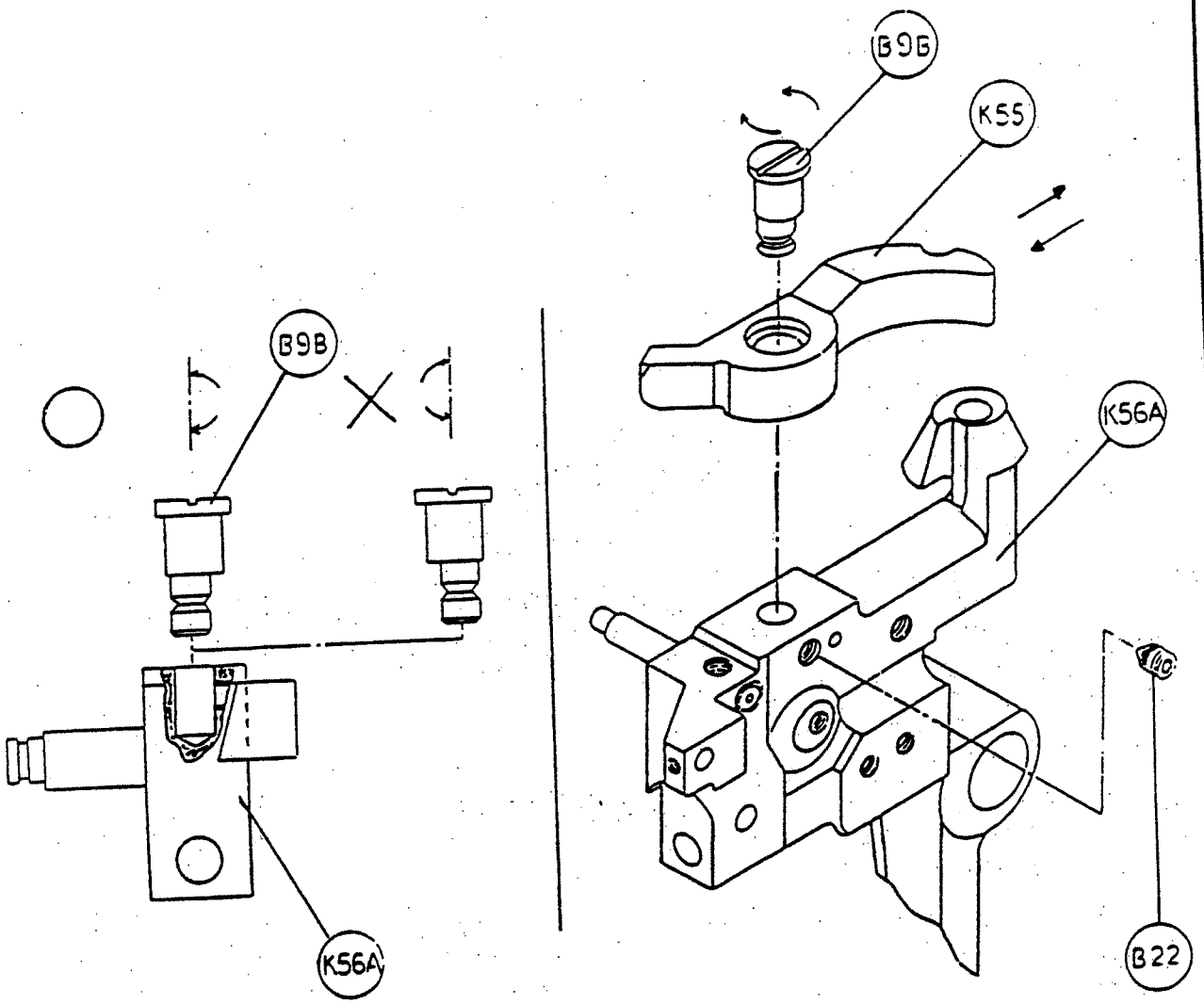
MODIFICATION made in FEBRUARY, 1989



New Part No.E1N Clutch Pulley has a V-shaped ditch.
Part No.E18 Needle Bearing is replaced by E18A Ball Bearing.

New Part Numbers

Part No.E1N	Clutch Pulley
Part No.E18A	Ball Bearing
Part No.E40	Stop Ring



MODIFICATION made in MAY, 1988

Part No. B-9 Knotter Lever Pin is made eccentric and permits adjustment of part no. K-55 Knotter Lever. Turn B-9 and K-55 can be moved back and forth slightly. Be sure to drive part no.B-22 tightly after adjusted K-55.

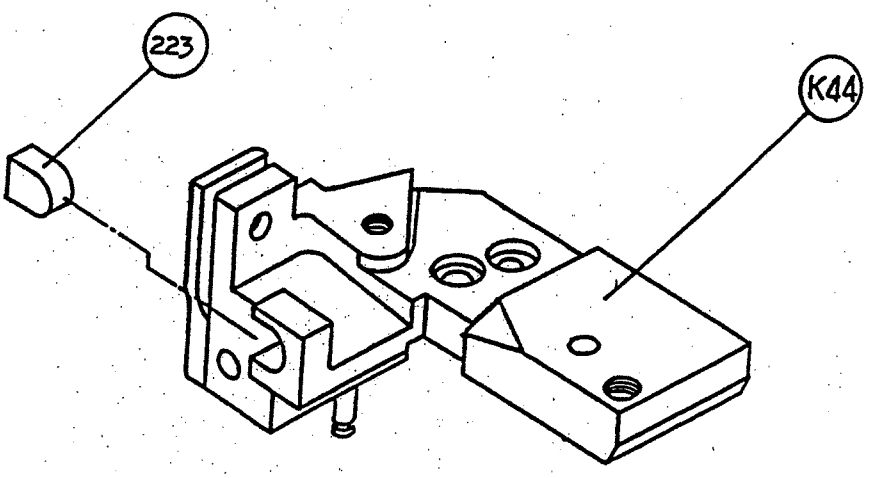
New Part Numbers

Part No.B-9B KNOTTER LEVER PIN (Eccentric)
Part No.K-56A KNOTTER BODY

Part no.K-56 is unavailable. When ordering K-56A, please include B-9B at the same time.

MODIFICATIONS made in April, 1989

1)



A new part, a piece of rubber, was furnished to the K-44 Stringholder Base as above. The purpose of this modification is to soften the hitting sound made by the K-64 Knife Holder when it strikes the K-44.

New Part Number	Description
No.223	Rubber

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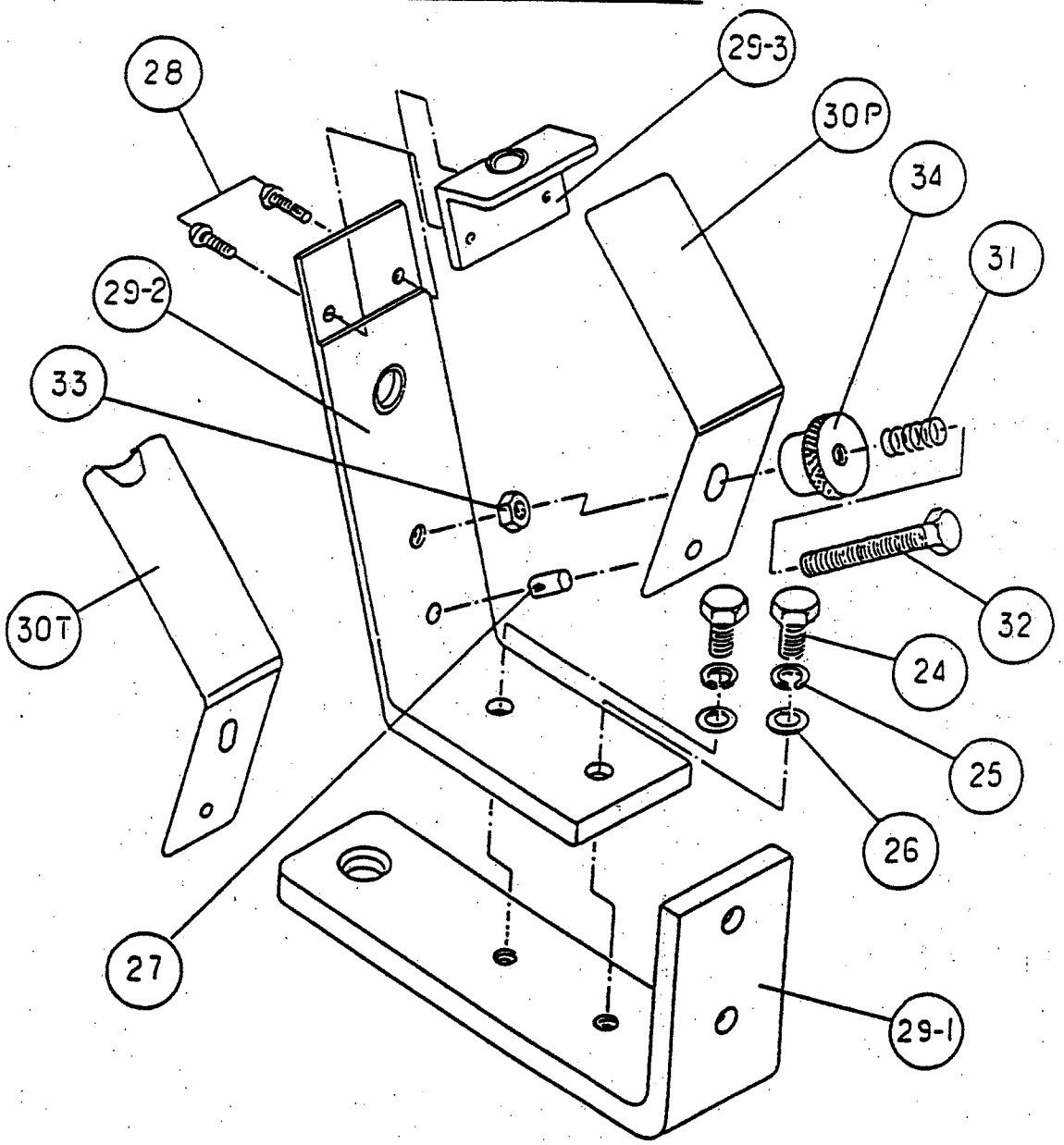
2) The D-9 Cam SHell used to be prepared to be available for both double-tie and cross-tie. However, from April, 1989, preparation for cross-tie has been made only by request. So, if cross-tie machines are required, please specify the same. Unless specified, the D-9 is always available only for double-tie.

29-AA

REAR TENSION DEVICE

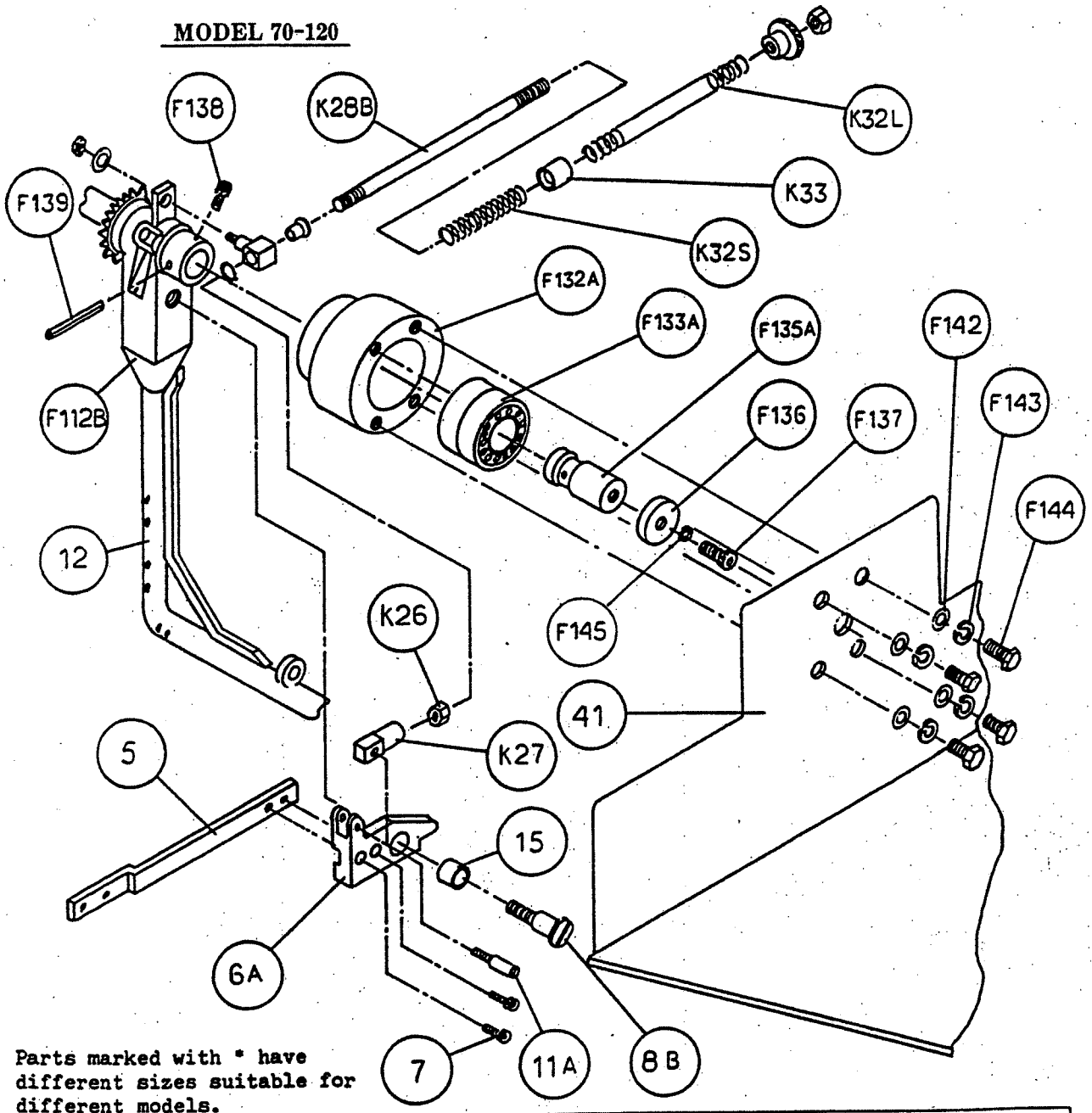


REAR TENSION DEVICE

24	Bolt M6x15	30T	Flat Spring for Twine
25	Spring Washer M6	30P	Flat Spring for PE Tape
26	Flat Washer M6	31	Coil Spring
27	Fastener Pin	32	Bolt M6x40
28	Screw M3x8	33	Nut M6
29-1	Rear Tension Frame (1)	34	Adjusting Nut
29-2	" " " (2)	29AA	Rear Tension Device Assembly Complete
29-3	" " " (3)		
29A	Rear Tension Frame Assembly (1)(2)&(3)		

LOOSE TABLE ASSEMBLY

MODEL 70-120

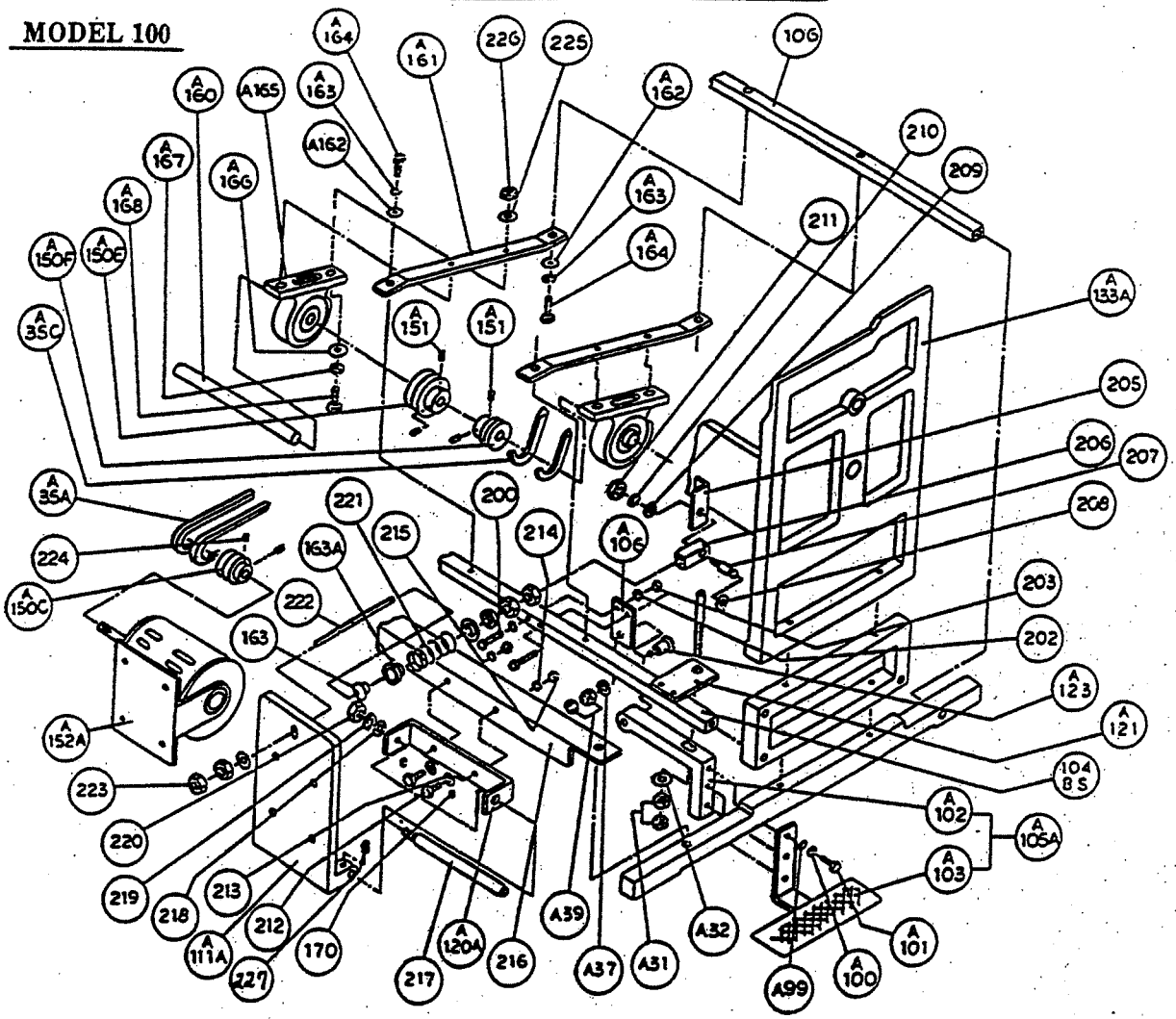


Parts marked with * have different sizes suitable for different models.

5	Drawback Lever *	F142	Washer 8mm
6A	Drawback Lever Base	F143	Spring Washer 8mm
7	Cap Screw M5x10	F144	Bolt M8x20
8B	Screw for Drawback Lever Base	K26	Nut 8mm
12	Arm *	K27	Connecting
15	Oiles	K28B	Tension Lod
41	Loose Table *	K32S	Tension Spring (Short)
F112B	Twine Arm Casting	K32L	Tension Spring (Long)
F132A	Bearing Case	K33	Collar
F133A	Bearing	F145	Spring Washer 6mm
F135A	Shaft		
F136	Washer		
F137	Cap Screw M6x20		
F138	Cap Screw M6x15		
F139	Spring Pin 5mmx40		

MOTOR AND PEDAL ASSEMBLY

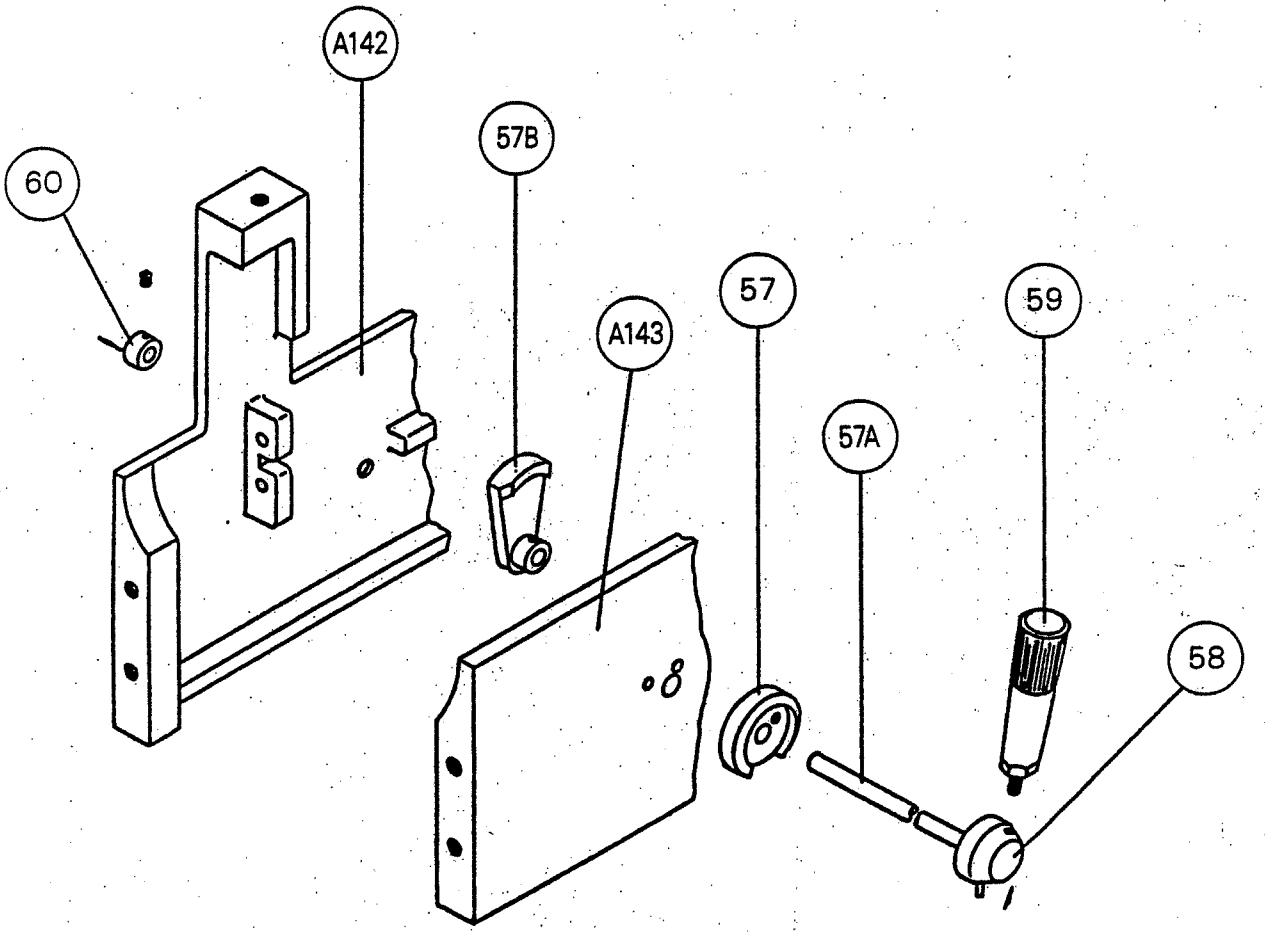
MODEL 100



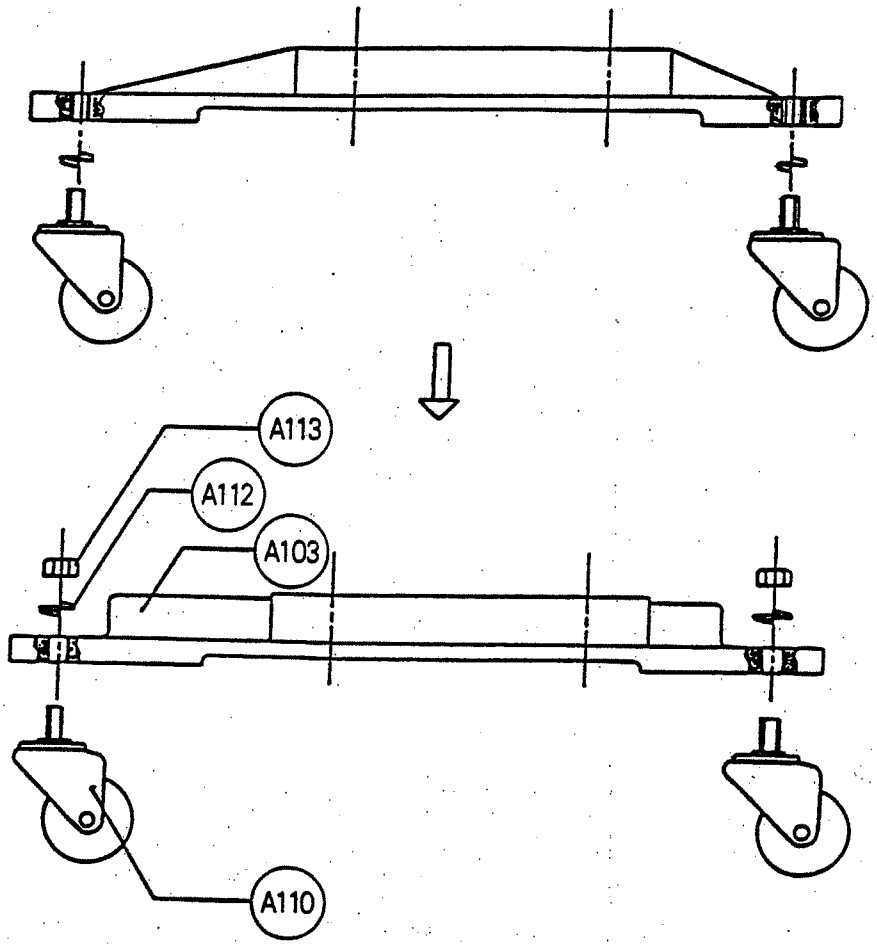
A31	Nut M8	A160	Counter Pulley Shaft	210	Spring Washer M12
A32	Washer M8	A161	Pillow Block Hanger	211	Nut M12
A35A	V Belt	A162	Special Flat Washer 8m/m	212	Bolt M6X25
A35C	V Belt	A163	Spring Washer M8	213	Flat Washer M6
A37	Washer M8	A164	Bolt M8X30	214	Spring Washer M6
A39	Nut M8	A165	Pillow Block	215	Nut M6
A99	Flat Washer M6	A166	Flat Washer M10	216	Angle Stay
A100	Spring Washer M6	A167	Spring Washer M10	217	Shaft
A101	Bolt M6x20	A168	Bolt M10X40	218	Flat Washer M12
A102	Foot Pedal(1)	104BS	Square Stay	219	Spring Washer M12
A103	Foot Pedal(2)	106	Square Stay	220	Nut M12
A105A	Foot Pedal Assembly	163	Spring Receipt	221	Spring
A106	Pedal Bracket	163A	Spring Receipt	222	Adjuster M12X230
A111A	Motor Base	170	Set Screw M6X6	223	Nut M12
A120A	Motor Base Bracket	200	Bolt M6X30	224	Set Screw m8x12
A121	Pedal Rod Guide	202	Spring Washer M6	225	Flat Washer M10
A123	Pedal Shaft	203	Nut M6	226	Nut M10
A133A	Front Frame	205	Hanger	227	Set Screw M8X8
A150C	Motor Pulley	206	Adjuster Top		
A150E	Counter Pulley(A)	207	Top Pin		
A150F	Counter Pulley(B)	208	Stop Ring		
A151	Set Screw M8X12	209	Flat Washer M12		
A152A	Motor				

Remark: 160 Collar was replaced by 227 Set Screw in Jan.,1988.

SAFETY DEVICE



57	Safety Device Cam
57A	Safety Device Shaft
57B	Safety Device Cam Lever
58	Safety Device Handle Holder
59	Safety Device Handle
60	Safety Device Collar
A142	Side Frame (Left)
A143	Side Frame (Right)



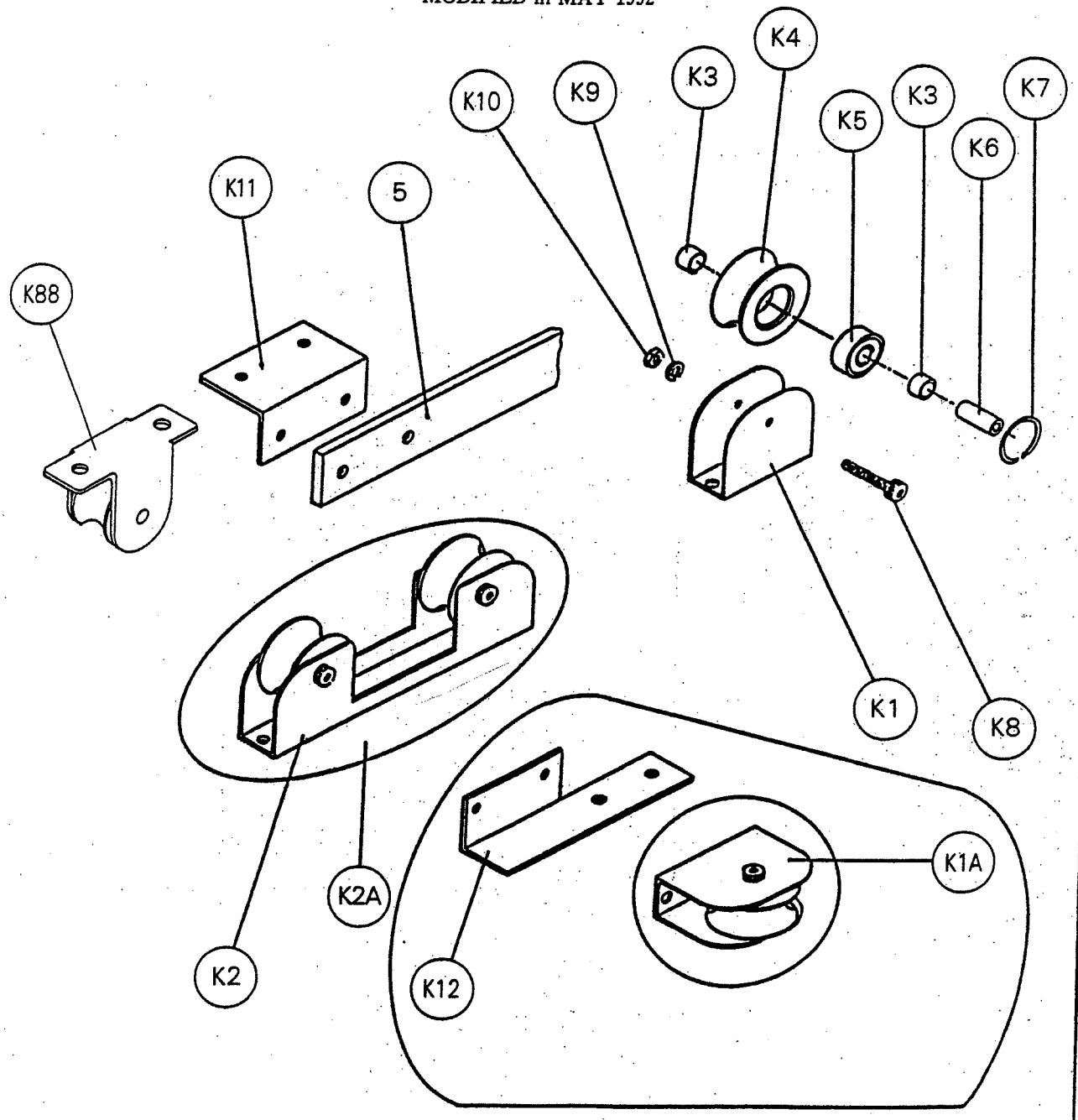
Models 20-45 modified in Aug. 1987

Models 50-60 modified in Oct. 1987

A-103	Frame Stand Model 20-45
A-103A	Frame Stand Model 50-60
A-110	Caster 65mm
A-110L	Caster 65mm Locking
A-112	Spring Washer 16mm
A-113	Nut 16mm
A-114L	Caster Locking Model 100/120
A-115	Nut 1/2

ARM ROLLER

MODIFIED in MAY 1992



5	Flat Tension Lever	K6	Shaft
K1	Guide Roller Receptacle	K7	Stop Ring
K1A	Guide Roller Assembly	K8	Cap Bolt
K2	Arm Roller Receptacle	K9	Spring Washer
K2A	Arm Roller Assembly	K10	Nut M3
K3	Collar	K11	Tension Roller Holder
K4	Roller	K12	Corner Roller Holder --- furnished to Model 70 and adove
K5	Bearing		
K88	Roller		

Modified in June 1995

The B-16 STAY is loosened or tightened by the CAP BOLT (8×30) on the A-143 SIDE FRAME instead of the B-26 BOLT.