

# BUNN®

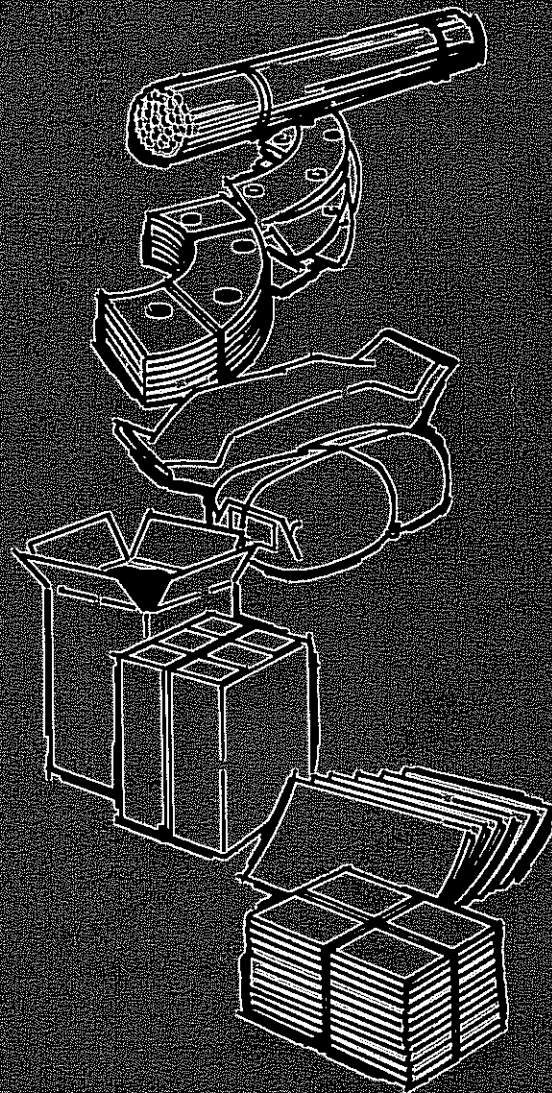
SINCE 1907 THE ORIGINAL  
PACKAGE TYING MACHINE

## TYING MACHINES

### Operator's Manual



- Quickly ties packages.
- Automatically adjusts to size.
- Any shape—any size.
- Ties small parts, irregular shapes, soft packages, cartons and publications.



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CABLE: "BUNNTYCO"

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# NOTICE

**DO NOT ATTEMPT TO OPERATE  
THIS EQUIPMENT BEFORE READING  
THE OPERATION INSTRUCTIONS  
AND PERFORMING THE BEFORE  
OPERATIONS CHECKS PARAGRAPH  
IN SECTION 3 OF THIS MANUAL**

## OPERATOR SAFETY REMINDERS

The National Safety Council reminds us that most accidents are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason, you, as a careful operator, are the best insurance against an accident.

Regardless of the care used in the design and construction of any type of equipment there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

- NEVER ATTEMPT TO THREAD, CLEAN, OIL OR ADJUST A MACHINE WHILE MOTOR IS OPERATING OR MACHINE IS IN MOTION.
- NEVER OPERATE MACHINE WITH ANY GUARD OR PANELS REMOVED AND KEEP HANDS AWAY FROM INSIDE OF GUARD TO AVOID BEING STRUCK BY TWINE ARM.
- DO NOT REMOVE GROUNDING PRONG FROM POWER CORD.

# BUNN.

## Operator's Manual

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## FOREWORD

This manual contains instructions for the installation, operation, preventative maintenance, troubleshooting, and repair parts identification for your Tying Machine Model manufactured by the B. H. Bunn Company, Alsip, Illinois. Proper use of the manual should ensure safe and efficient operation and maintenance of the tying machine.

Because of the increasing staff of Service Representatives, B. H. Bunn Company can now offer a Maintenance Contract. Contact your local Service Representative, who is capable to render factory approved service, for full detail maintenance contract information, or the B. H. Bunn Company.

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# Section I INTRODUCTION

## PURPOSE OF TYING MACHINE

The primary purpose of the tying machine is to automatically tie mail, packages, cartons, pieceparts, printed matter, newspapers, laundry, produce, meat, corrugated cardboard, and miscellaneous materials and products requiring a secure wrap (figure 1). The tying machine ties almost everything that was previously wired, banded, taped, strapped or previously tied by hand in offices, factories, and commercial establishments. The tying machine reduces tying time, employee effort and fatigue, reduces twine lint and twine waste, enables trained operators to make secure ties quickly, ties larger bundles with greater ease and efficiency, and discourages tampering because the tied knot cannot be duplicated by hand tying.

## GENERAL DESCRIPTION

The tying machine is of steel, cast iron, and high impact plastic construction. Heavy duty panels and guards completely enclose the moving parts of the tying machine to prevent accidental operator contact. However the unique design of the tying machine still provides the operator with easy accessibility to maintenance points without the use of tools. For ease of mobility caster wheels are used. A break feature on each caster resists movement of the tying machine when assigned a permanent position. The "on-off" switch (used to supply electrical power) and a foot pedal (used to initiate the tying cycle) are within easy and comfortable reach of the operator. The material tying area consists of a front table, back table and standard. The standard is used as a positioning guide for the material to be tied when placed on the front and back tables. A knotter head assembly, stringholder assembly, twine arm, and drive assemblies comprise the tying cycle components.

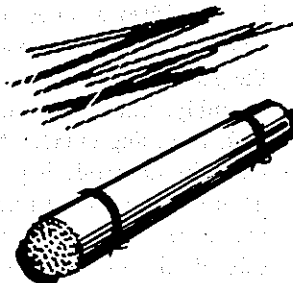
## PRINCIPLES OF OPERATION

### DOUBLE WRAP ONE WAY

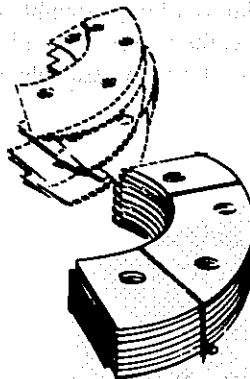
With the tying machine power cord connected to an appropriate power source and the material to be tied properly positioned on the front table and back table, the operator then places the "on-off" switch in the "on" position. Electrical ac power is then transferred by the switch to start the motor. The motor rotating at approximately 1725 RPM drives the pulley assembly on the clutch shaft via the V belt mechanically coupling the pulley assembly to the motor. At this time, the tying machine is considered to be in a locked condition until the operator applies toe pressure

Ties packages quickly, and automatically adjusts to any shape, any size for

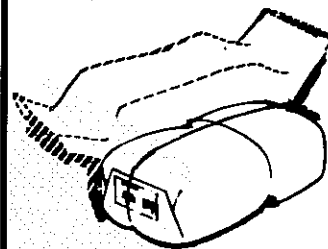
small parts,



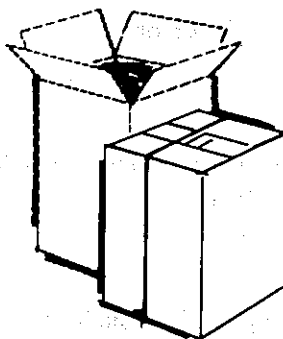
irregular shapes,



soft packages and parcels,



mail, cartons, and parcel post, and



printed materials and publications

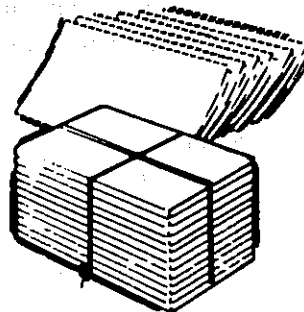


Figure 1 Tying Capabilities

to the foot pedal to begin the wrapping and tying cycle. Depressing the foot pedal causes the trip cable to position the bell crank and kickout assembly so the kickout wedge slides free from the fork clutch assembly.

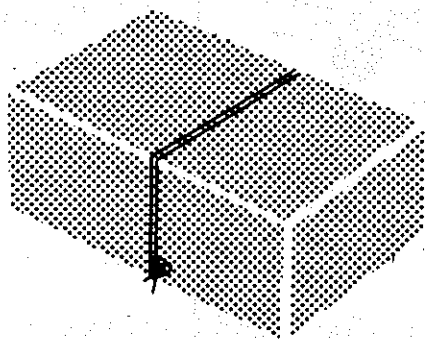
Repositioning the kickout wedge permits the lever clutch of the kickout mechanism to first pull away from the clutch kickout block on the main cam assembly and then is engaged by the fork clutch. As soon as this occurs, the clutch shaft becomes unlocked and starts to rotate which in turn drives a series of gears; main shaft main gear and chain gear. As a result, the twine arm begins to swing around the package being tied pulling the twine from the cone pilot assembly, through the properly adjusted tension device and each threading guide. After the second swing of the twine arm, the drawslide is positioned to allow the twine to fall directly behind the stringholder button. The drawslide then pushes the twine from the stringholder button to the left side of the forward moving knoter body as viewed from the right-hand side of the tying machine. Simultaneously the twine arm is continuing its arc and the knoter body turns counter-clockwise opening its jaws for the two strands of twine which are wrapped around the knoter body assembly. The strands of twine are brought through the jaws and the jaws firmly lock. The knoter body assembly then moves toward its finished position and the stripper forces the twine strands off the knoter body assembly jaws into the tight parts of the knot. As the two strands of twine are pulled into loops from the knoter body assembly jaws,

the knife trap moves forward, cuts a fresh end of twine and pulls the previously cut end of the twine from behind the stringholder button. The knoter body assembly completes its movement to the finished position and the knoter body assembly jaws open to release the loops, completing the tying process.

The tied bundle is then removed from the tying machine.

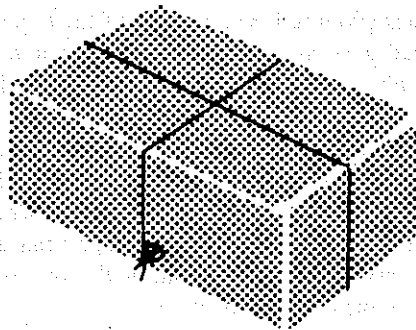
### DOUBLE WRAP CROSS TIE

The double wrap cross-tie tying cycle (available on Model 142 X only) operates in exactly the same manner as the double wrap one way tying cycle previously described above except that the twine arm rotates once around the bundle being tied then automatically stops. The operator properly repositions the bundle 90 degrees in a clockwise direction, again applies toe pressure to the foot pedal, and the twine arm rotates around the bundle once more automatically completing the knot tying processes. The bundle is cross-tied once in each direction with one strand of twine and is tied with one knot.



Double Wrap  
ONE WAY

Two wraps in one direction  
with one knot.



Double Wrap\*  
CROSS TIE

One wrap in each  
direction with only one knot.

\* Double wrap cross tie also provides: (1) two wraps in one direction if package is not turned between wrap cycles; (2) one way by tripping out the first wrap.

Figure 2. Basic Types of Different Wraps Between Models.

## Section II PREPARATION FOR USE

### UNCRATING INSTRUCTIONS

1. Cut bands securing carton to skid.
2. Cut at bottom of cardboard carton securing cardboard carton to skid.
3. Carefully raise and remove carton from tying machine.
4. Carefully open and remove plastic bag protecting tying machine.
5. Cut bands securing base frame of tying machine to skid and then pull tying machine away from skid.

#### NOTE

The plastic bag protecting the tying machine during shipment can be used as an effective cover when the tying machine is not in use.

6. Remove the box in the twine container shipped with the tying machine containing four casters.
7. Using the casters shipped with the tying machine, insert a caster into the caster socket on each leg of the tying machine base frame.

If any problems are encountered, contact your local B.H. Bunn factory representative.

### POWER REQUIREMENTS

The single phase, 1/4 hp, 1725 rpm standard motor provided with your tying machine requires an external power source of 115 volts at 60 Hertz. A standard three-prong electrical cord is provided with the electrical motor. If a three-prong

is not available at the installation site, a three-prong adapter should be used with the electrical cord. Upon request, optional electrical motors are available to meet specific power requirements. A convenience outlet for the electrical power cord should be installed at the working location(s) to reduce the hazard of tripping over the cord. When installed the convenience outlet must meet all the electrical standards and wiring color codes for your geographical area.

### TYING MATERIALS

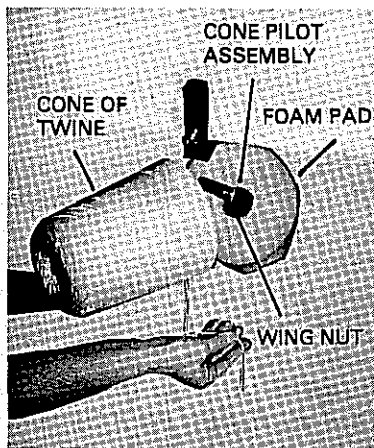
The tying machine is adaptable to a wide range of tying materials ranging from natural fibre twines to synthetics which can replace wire and strapping in a great many applications. Be sure that the twine or tape being used is of the proper type for the tying application. The right Bunn tying twine can improve production up to 50 percent because it has been tested and approved for use on your machine. It runs through the machine smoothly. Bunn Twine is of uniform size and strength and is free of knots and irregularities that snag and break. It is super-strong and fray-resistant, with minimum linting eliminating twine snagging and breaking. A free sample folder showing actual twine samples and specifications is available through your local B.H. Bunn factory representative or the B.H. Bunn Company.

The twine cone pilot assembly will hold up to a 10-pound cone of twine. The base diameter of the cone must not exceed 9 inches.

# ILLUSTRATED THREADING PROCEDURES

Before the tying machine is shipped, it is threaded through each guide starting from the twine cone pilot to the string-holder button. To avoid threading problems in the future, you should become familiar with the threading sequence at this time. Complete threading of the tying machine can be avoided if the end of the twine or tape being used is caught before it passes through the quill shaft. This is accomplished by simply tying the end of the existing twine or tape to

the starting end of the new twine or tape with a square knot. If the end of the twine or tape is not caught before it passes through the quill shaft, the tying machine must be threaded as explained in the subsequent procedures. It is important to observe the various openings which are identified by numbered labels affixed to the machine through the twine is to be threaded. Never thread machine while motor is operating.



1. Place power switch in "OFF" position.

2. REMOVE ELECTRICAL CORD FROM POWER RECEPTACLE.

3. Position cone of twine or tape over the cone pilot assembly. Press firmly until seated on foam pad.

## NOTE

Check proper adjustment of twine cone pilot assembly by moderately trying to turn cone of twine or tape. If movement is encountered, adjust twine cone pilot assembly until cone of twine is secured by the twine cone pilot assembly.

4. Grasp starting end of twine or tape and pull approximately 5 to 6 feet of twine or tape through large round hole at bottom of bracket tension device labeled No. 1.

5. Gently pull tension spring back and thread:

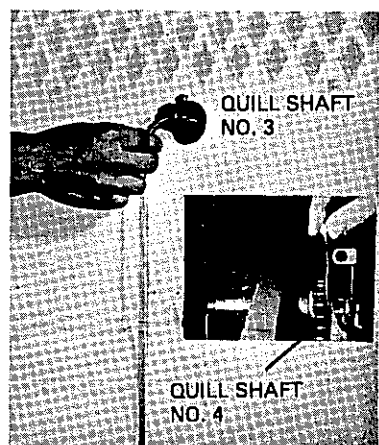
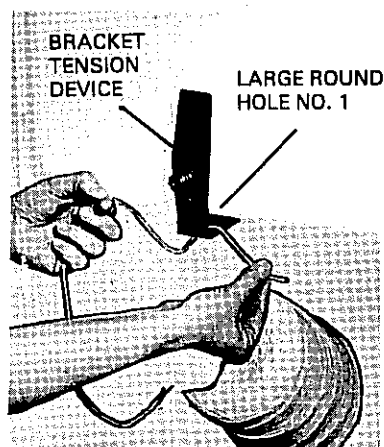
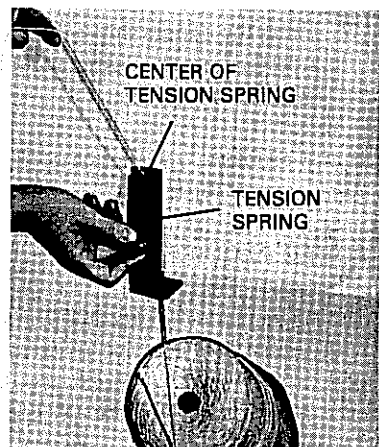
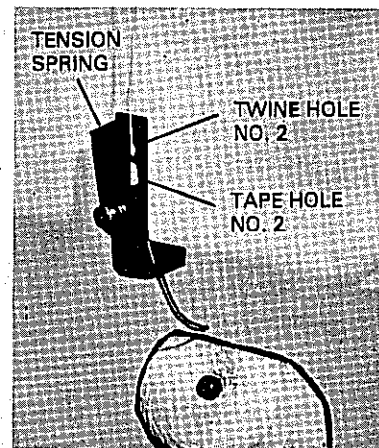
Twine Through bracket tension device small round hole.

Tape Through bracket tension device large round hole.

## NOTE

Both holes are identified by Number 2 Label.

6. Release tension spring making sure twine or tape is positioned under center of tension spring.





## NOTE

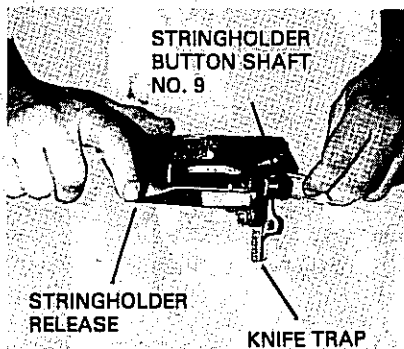
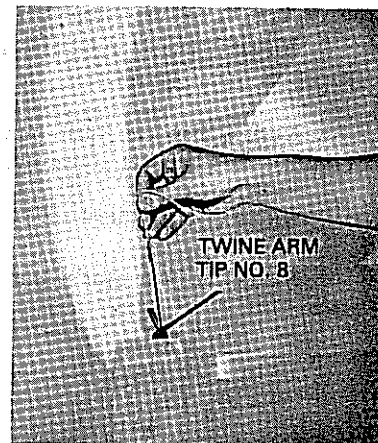
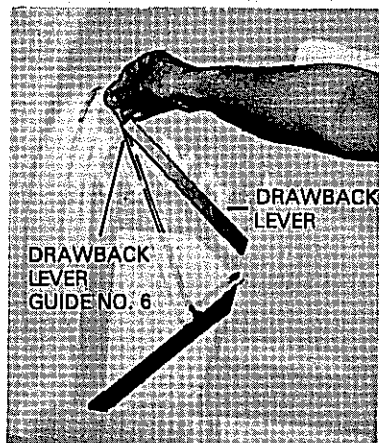
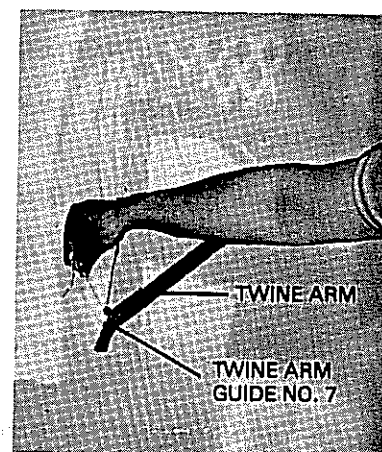
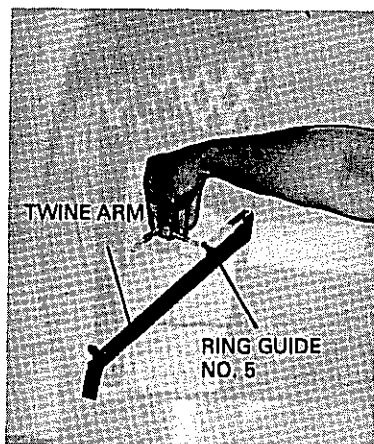
Make sure that appropriate tension spring is installed before proceeding with the threading of the tying machine. It is recommended that a threading tool which may be purchased from your local Bunn factory representative be used to perform steps 7 and 8.

7. Insert twine through quill shaft labeled No. 3.

8. Fish twine out from quill shaft labeled No. 4. After twine is free, thread twine through ring guide labeled No. 5 on twine arm.

9. Pull twine through backside of draw back lever opening labeled No. 6 and then down through ring guide labeled No. 7 at bend in twine arm.

10. Continue to thread twine or tape through twine arm tip labeled No. 8. Pull twine over to the right side of tying machine and press back stringholder release lever. Place twine under stringholder button shaft labeled No. 9., pull up and over shaft and release stringholder release lever. Pull twine taut and press knife trap toward front of tying machine to cut off excess twine.



## Section III OPERATION

### BEFORE OPERATION CHECKS

1. TURN MASTER SWITCH TO THE "OFF" POSITION.
2. Check tying machine threading sequence.
3. Check twine or tape cone for proper positioning over cone pilot assembly.
4. Check if twine or tape cone is properly seated on foam pad.
5. Check twine running tension by pulling twine from end of twine arm assembly. A smooth easy running tension should be felt.
6. Check proper adjustment of twine cone pilot assembly.
7. Visually check tying machine for any mechanical defects or missing parts.
8. Verify that electrical power cord is inserted into receptacle and then set power switch to the "ON" position.

### ONE-WRAP OPERATION

1. Stand at operator's position-front of the tying machine.

2. Position power switch located on the left-hand side of tying machine to the "on" position.

3. Hold ends of package between thumbs and forefingers of both hands and position package on tying machine table so that right side of package is butted against standard or notch in front table (figure 3) and positioned over gap between front and back tables.

4. Momentarily depress foot pedal holding package firmly until tying cycle is completed. The tying cycle is completed after the twine arm makes the required wraps.

### NOTE

The tying machine automatically compensates for the size and shape and the different lengths of twine required. The tying machine also automatically applies the correct amount of tension, ties the patented slipproof and tamper-proof knot and then cuts the twine.

5. Remove package from tying machine.
6. Repeat steps 3 through 5 above for each package to be tied.
7. After all packages have been tied, set power switch to "off" position.

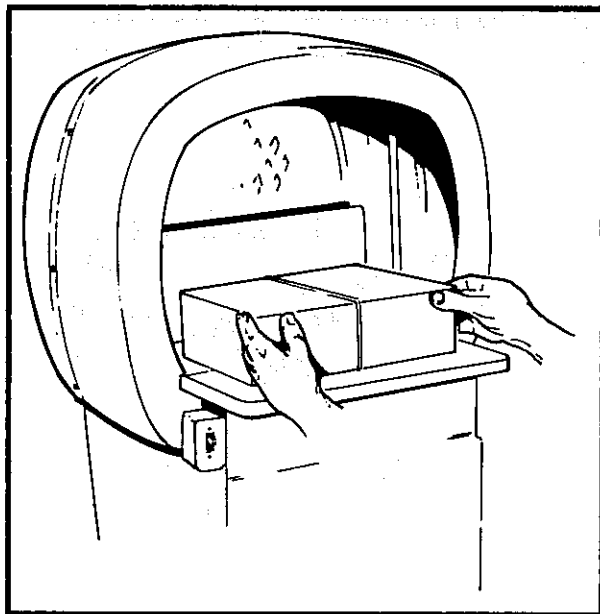


Figure 3. Positioning Package for Tying

## CROSS WRAP OPERATION

1. Stand at operator's position-front of the tying machine.
2. Position power switch location on left-hand side of tying machine to the "on" position.
3. Hold ends of package between thumbs and fore-fingers of both hands and position package on tying machine table so that right side of package is butted against standard or notch in front table (figure 4) and positioned over gap between front and back tables.

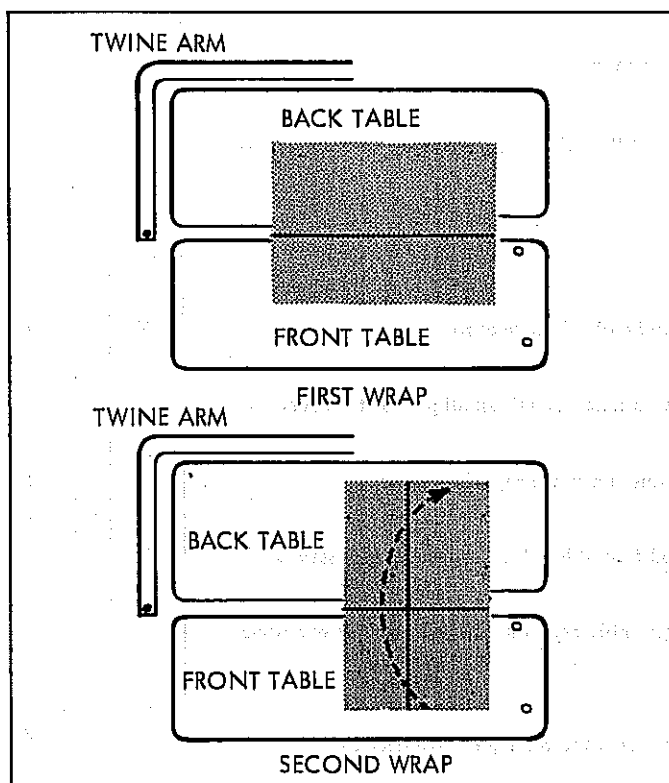


Figure 4. Positioning Package for Cross-Tie

4. Momentarily depress foot pedal holding package firmly until tying arm completes one revolution.
5. Turn package 90 degrees IN CLOCKWISE DIRECTION (figure 4) in tying machine.
6. Depress foot pedal (second time) holding package firmly until tying cycle is completed.
7. Remove package from tying machine.
8. Repeat steps 3 through 6 above for each package to be tied.
9. After all packages have been tied, set power switch to "off" position.

## AFTER OPERATION PROCEDURES

1. Check remaining supply of twine or tape. If supply is low tie the end of the existing twine or tape to the starting end of the new twine or tape with a square knot.
2. Clean any lint that may have collected in stringholder casting hole. A small pair of tweezers can be used for this purpose.
3. Cover tying machine with plastic bag used to ship tying machine.

## Section IV MAINTENANCE

### INTRODUCTION

The following paragraphs provide maintenance instructions and maintenance function schedules. Maintenance responsibility of the tying machine should be assigned to the maintenance mechanic or other authorized personnel.

A good preventive maintenance program is a major step forward to assure trouble-free tying machine operation. In order to be effective, routine inspection, lubrication, and adjustment schedules must be established and followed. The following Table of Preventive Maintenance Checks and Services and Table of Lubrication Requirements is provided for tying machines subjected to normal usage which is considered to be approximately 30 hours of operation weekly. Substantial deviations from normal usage should require an adjustment in the indicated frequencies. Frequencies established in the Table of Preventive Maintenance Checks and Services are: Daily (D), Monthly (M), and every third month (Q). The Table of Lubrication Requirements has frequencies of 50 and 150 hours. The tables should be copied for use by maintenance personnel, to facilitate checking off each item as it is performed. These lists can then be signed and dated to serve as an accurate record of preventive maintenance work performed. Deviations from normal tying machine usage should become a part of the records for the tying machine.



# TABLE OF PREVENTIVE MAINTENANCE CHECKS AND SERVICES

CHECK OR SERVICE ITEM	FREQUENCY		
	D	M	Q
<b>ELECTRICAL COMPONENTS</b>			
1. Check electric power cord and plug. Cord should not be frayed and should be securely fastened. Plug should not be faulty.		X	
2. Check electric motor assembly, especially breather vents, which should be free of dirt and foreign particles.		X	
3. Operate electric motor assembly and listen for abnormal noises.	X		
4. Check condition of power switch to verify that it is securely mounted and operating properly.	X		
<b>MECHANICAL COMPONENTS</b>			
1. Operate tying machine and observe that it ties a bundle or package correctly.	X		
2. Remove lint and loose twine from stringholder button holes using a small pair of tweezers.	X		
3. Check twine (or tape) running tension. Readjust twine tension spring if necessary.		X	
4. Check condition of knife. Knife should be sharp and free of knicks. Replace if necessary.	X		
5. Check for proper position of star wheel and shaft assembly gear and observe gear for excessive wear. Replace if necessary.		X	
6. Check for cracked or broken teeth on gears and sprockets and main gear. Replace as required.			X
7. Check condition of v-belt for evidence of fraying. Replace if required.		X	
8. Check for loose pins and set screws in gears.			X
9. Check entire tying machine for loose hardware. Tighten loose hardware as required.	X		
10. Check for broken or weak knottter flat springs and weak tension. Replace as required.	X		



## TABLE OF LUBRICATION REQUIREMENTS

LUBRICATION ITEM	FREQUENCY	
	50 HOURS	150 HOURS
<p style="text-align: center;"><b>NOTE</b></p> <p>Apply several drops of SAE 10 oil or equivalent unless otherwise specified. If necessary, refer to the exploded views in the parts list section of this manual for assembly part nomenclature</p>		
<b>KNOTTER HEAD ASSEMBLY</b>		
1. Oil cup (Knotter Head Pivot).		
2. Two oil holes (encircled in red on Knotter Head Sub-assembly).	X	
3. Oil hole (encircled in red on Star Wheel and Moter Gear Assembly).	X	
4. Between knotter lever and knotter head subassembly.		X
5. Around diameter of knotter roller.		X
6. Knotter lock plunger.		X
<b>STRINGHOLDER AND KNIFE TRAP ASSEMBLY</b>		
1. Between knife trap rivet and knife trap lever assembly.	X	
2. Between knife trap shoulder screw and knife trap lever assembly.	X	

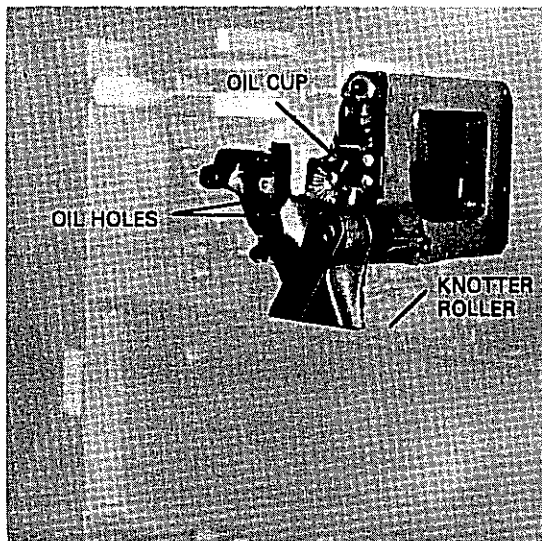


Figure 5. Knotter Head Assembly  
Lubrication Diagram

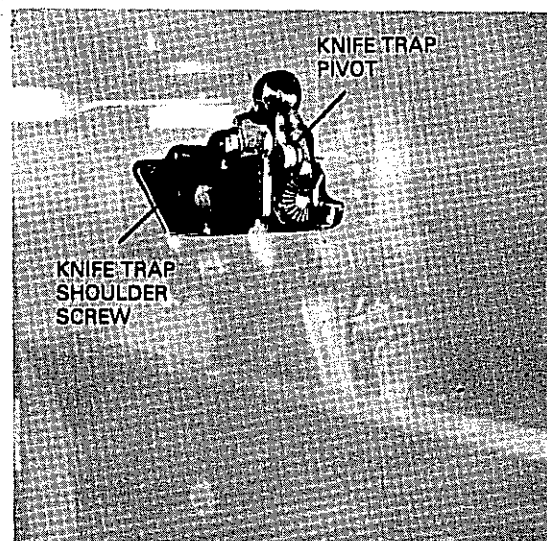


Figure 6. Stringholder and Knife Trap Assembly  
Lubrication Diagram

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DEPARTMENT OF THE HISTORY OF ARTS AND ARCHITECTURE

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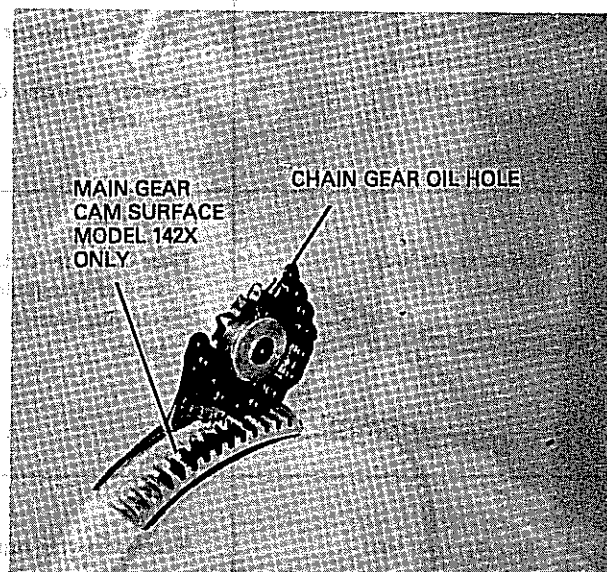
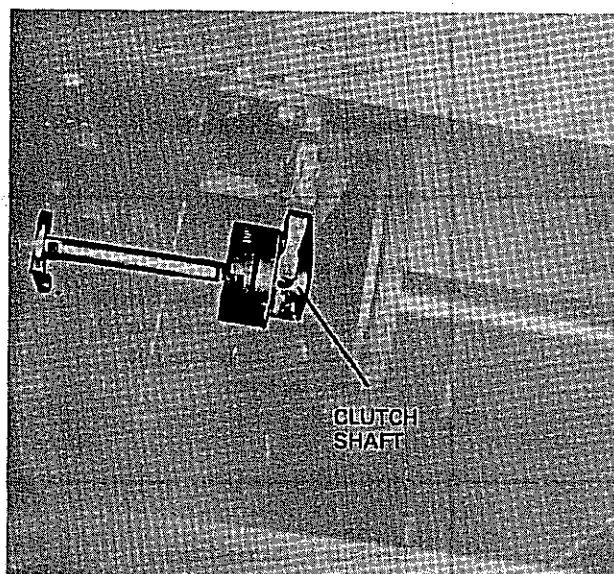
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LUBRICATION ITEM	FREQUENCY	
	50 HOURS	150 HOURS
<p align="center"><b>NOTE</b></p> <p align="center">Apply a liberal coat of recommended lubricate to the following unless otherwise specified.</p>		
<b>DRIVE ASSEMBLY</b>		
1. Main gear cam surface (Model 142 X only)		<b>X</b>
2. Knottter rack assembly cam surface and teeth.		<b>X</b>
3. Cam riser cam surface.		<b>X</b>
4. Cam switch cam surfaces.		<b>X</b>
5. Apply several drops of SAE 10 oil to chain gear oil hole (encircled in red on machine).	<b>X</b>	
6. Apply several drops of SAE 10 oil to the oil cup(s) located at the rear of the tying machine. Model 142 E has one oil cup and Model 142 X has two oil cups.	<b>X</b>	
7. Clutch fork pivot pin.	<b>X</b>	



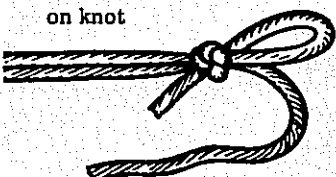
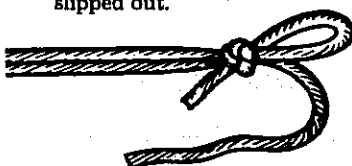
**Figure 8. Drive Assembly Lubrication Diagram**  
(2 of 2)


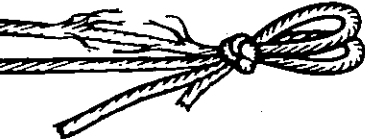
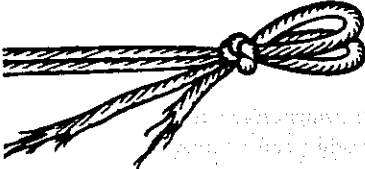


## Section V TROUBLE SHOOTING

This section of the manual contains a Table of Trouble Shooting Information for locating and correcting most of the troubles which may develop in the tying machine. The tying machine is generally trouble free. However, the tying machine suffers the usual wear and misadjustment from normal use. Careful inspection and accurate analysis of the symptoms



listed in the Table of Trouble Shooting Information will localize the trouble more quickly than any other method. This manual cannot cover all possible troubles and deficiencies that may occur, therefore, if a specific trouble is not covered herein, proceed to isolate the major component in which the trouble occurs and then isolate and correct the trouble.

TABLE OF TROUBLE SHOOTING INFORMATION

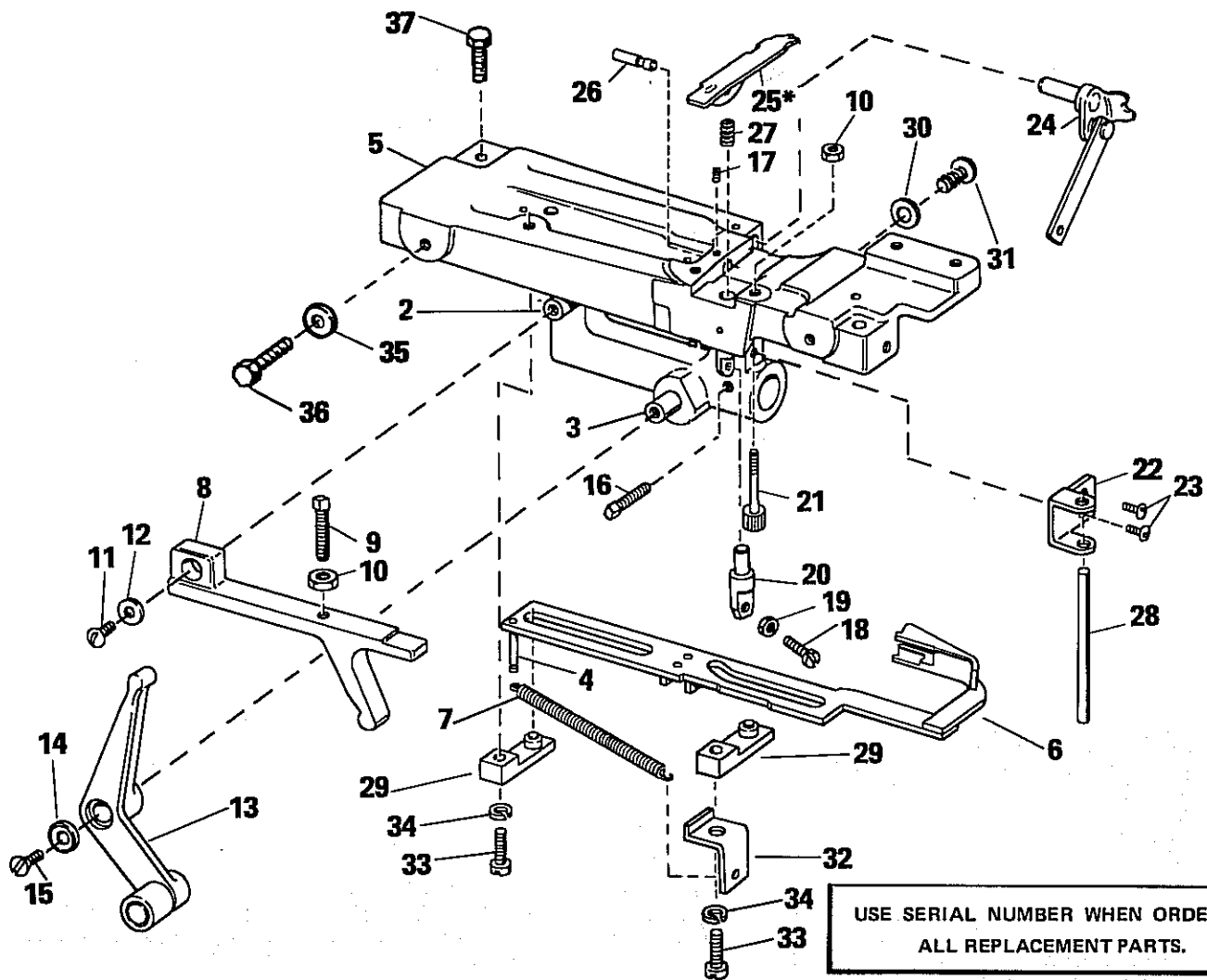
TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
a. Tying machine will not operate with power switch set to "on" position.	Electric power cord not plugged into receptacle.  Circuit breaker tripped.  Broken or disconnected circuit wire.  Faulty power switch.	Plug electric power cord into receptacle.  Reset circuit breaker. If circuit breaker trips again, inspect and test for short in tying machine circuit or electric power cord. Correct defect as required.  Repair or replace broken wire.  Replace defective power switch.
b. Twine (or tape) breaks frequently in stringholder button.	Improper twine (or tape).  Excessive stringholder button tension.	Use proper size of twine (or tape).  Readjust stringholder button pressure.
c. Half or single loop on knot 	Piece of twine (or tape) wrapped around stringholder button shaft relieving tension on twine (or tape).	Depress and hold button release lever and remove bits of twine (or tape) using a small pair of tweezers. Then release button release lever.
d. One loop knot that slipped out. 	Excessive twine running tension.	Readjust to decrease twine running tension.

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
<p>e. One long and one short loop.</p> 	<p>Improper twine (or tape).</p> <p>One loop catching in back of knotter throat, improper knotter release adjustment.</p>	<p>Use proper size of twine (or tape).</p> <p>Readjust knotter release.</p>
<p>f. Break in twine in front of knot.</p> 	<p>Friction along twine (or tape) path.</p>	<p>Remove sharp edges from twine path in twine tension plate assembly, twine bracket, quill shaft, twine arm hub, twine arm assembly ring guides, drawback lever, and twine arm tip.</p>
<p>g. Ragged ends of twine at knot.</p> 	<p>Dull or knicked knife.</p>	<p>If knife is excessively knicked, replace. If knives continue being knicked, lubricate knife trap pivot points to assure that knife trap does not stick, allowing knife to remain in path of drawslide.</p>
<p>h. Loose knot and loops slightly shorter than normal.</p> 	<p>Loops release from knotter too soon, improper knotter release adjustment.</p> <p>Stripper too short.</p>	<p>Readjust knotter release.</p> <p>Replace stripper.</p>
<p>i. Short loops and tight knot.</p> 	<p>Improper balance between twine running tension and stringholder button pressure.</p>	<p>Check stringholder button pressure. Readjust twine running tension.</p>



TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
<p>j. Cut loop ends.</p> 	<p>Stripper points shearing against side of knotter jaws when stripping.</p>	<p>Readjust stripper shear action, bend top front end of stripper down tapping with a light hammer.</p>
<p>k. Very short loops and long ends.</p> 	<p>Knot slipping by stripper. Improper gap between stripper point and knotter.</p> <p>Knotter flat springs broken or weak.</p>	<p>Realign stripper point and knotter.</p> <p>Replace knotter flat springs.</p>
<p>l. Twine (or tape) catches in stripper.</p>	<p>Stripper spring broken or weak.</p>	<p>Replace stripper spring.</p>
<p>m. Twine (or tape) pulls out of stringholder button.</p>	<p>Twine (or tape) improperly threaded.</p>	<p>Check stringholder button threading and rethread if necessary.</p>

# MAIN TABLE ASSEMBLY

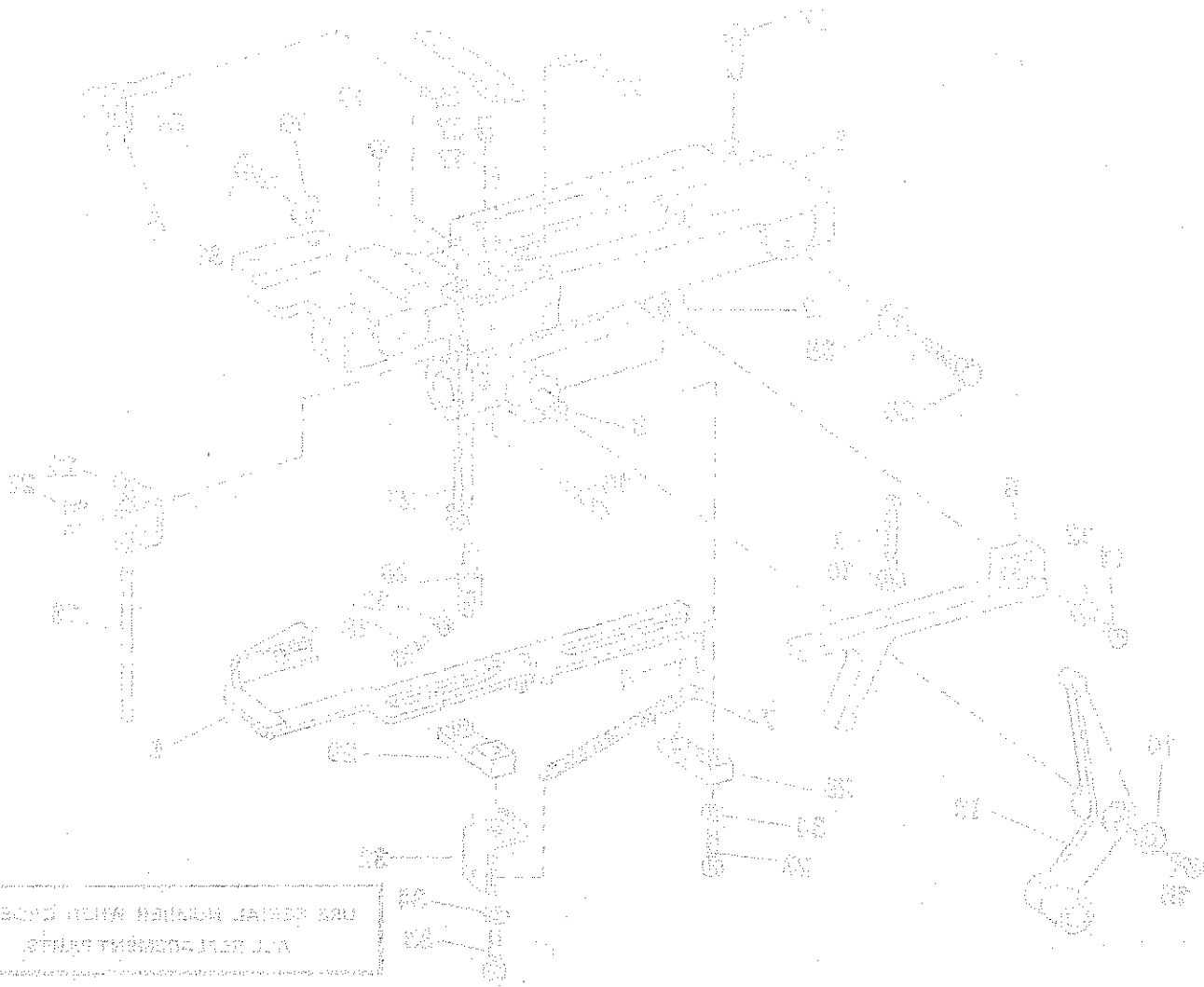


Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	008—	Main Table Assembly	1	18	100018	Screw-Knotter release adjusting	1
2	081014	Riser Lever Stud	1	19	100191	Nut-Jam, hex, 1/4-28 NF	1
3	081013	Drawslide Lever Stud	1	20	081056	Stud-Knotter release	1
4	101775	Drawslide Spring Pin	1	21	100591	Stud-Knotter, head stop	1
5	008009	Main Table Sub-Assembly. Note	1	22	083073	Guide-Riser pin	1
6	045035	Drawslide and Cap Assembly	1	23	100099	Screw-Round head, self tap 10-24 NC x 3/8 in. long	2
7	074014	Spring-Drawslide	1	24△	032035	Tip-Up Assembly	1
8	032003	Riser Lever	1	25△	052—	Stripper	1
9	100124	Screw-Set, square head, half dog point, 1/4-20 NC x 1 in. long	1	26	083071	Pin-Stripper pivot	1
10	100150	Nut-Hex, 1/4-20 NC	2	27△	074006	Spring-Stripper	1
11	100098	Screw-Round head, 10-24 NC x 3/8 in. long	1	28△	083060	Pin Riser	1
12	100131	Washer-Flat, 1/2 o.d. x 7/32 i.d. x 3/64 in. thk.	1	29	070049	Drawslide Cap Assembly	2
13	032075	Drawslide Lever Assembly	1	30	100134	Washer-Drawslide Lever	1
14	100019	Washer-Drawslide Lever	1	31	100566	Screw Drawslide Lever	1
15	100110	Screw-Flat head, slotted 1/4-20 NC x 1/2 in. long	1	32	025288	Bracket Drawslide Spring	2
16	100596	Screw-Set, square head, cup point, 1/4-20 NC x 3/4 in. long	1	33	100104	Drawslide Screws 1/4-20 x 1 in. long Fillster Head	2
17	100121	Screw-Set, socket head, cup point, 8-32 x 1/4 in. long	1	34	100135	Washers Split-Lock 1/4 in.	2
				35	100185	Shim-Main Table	2
				36	100273	Screw-Hex Head 5/16-18 x 3/4	2
				37	100615	Screw-Hex Head 5/16-18 x 1 1/4	1

— Tying Machine Model Number and Serial Number Required When Ordering.

\* Specify Type Twine or Tape Being Used. △ Not Part of Assembly, Order Separately.

NOTE: Sub-Assembly includes Items 2, 3, 4, 10, 16, 17, 18, 19, 20, 21, 22, and 26.

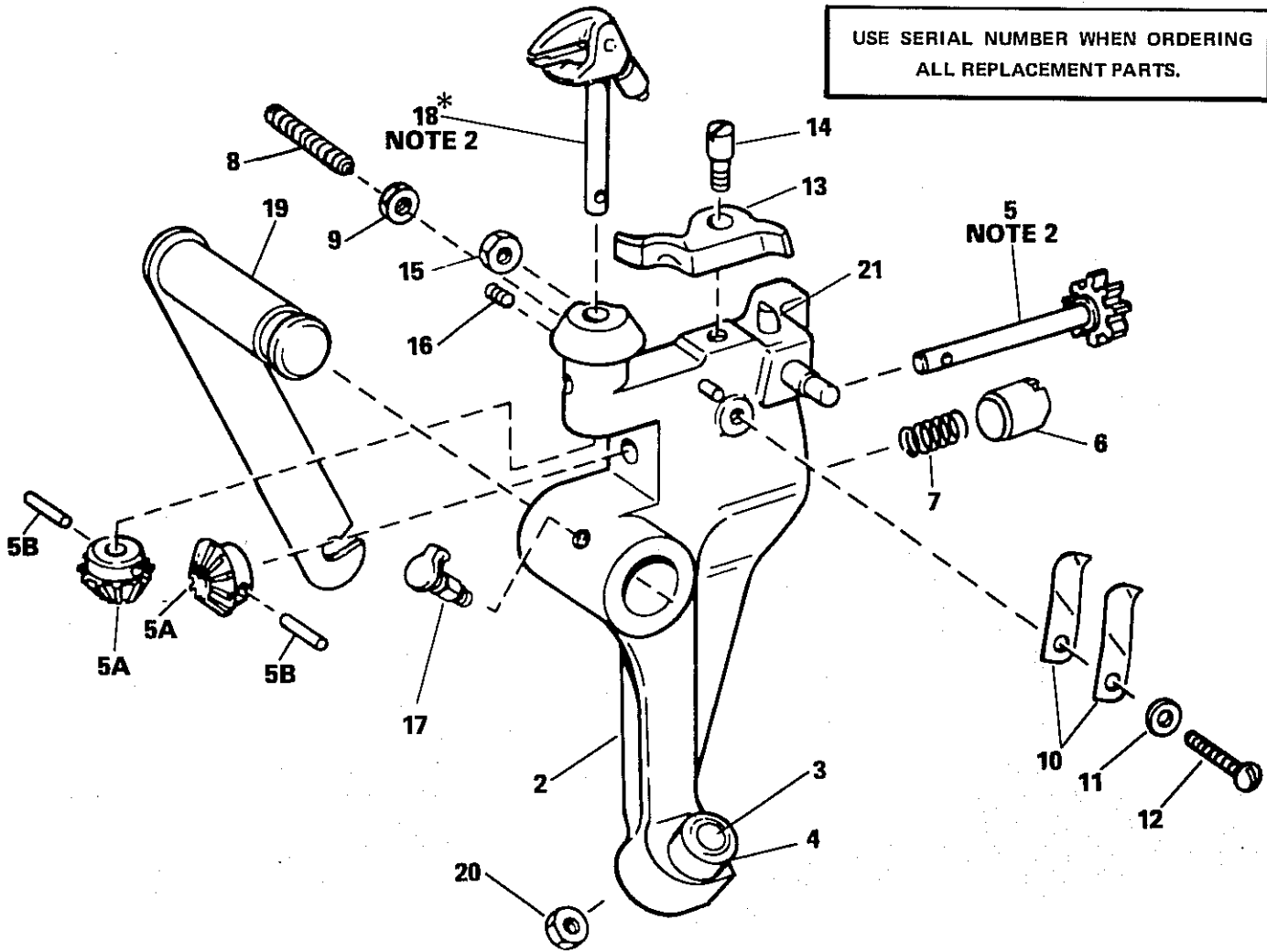


Station	Description	Station	Description
1	Water Main at 1st St.	1	Water Main at 1st St.
2	Water Main at 2nd St.	2	Water Main at 2nd St.
3	Water Main at 3rd St.	3	Water Main at 3rd St.
4	Water Main at 4th St.	4	Water Main at 4th St.
5	Water Main at 5th St.	5	Water Main at 5th St.
6	Water Main at 6th St.	6	Water Main at 6th St.
7	Water Main at 7th St.	7	Water Main at 7th St.
8	Water Main at 8th St.	8	Water Main at 8th St.
9	Water Main at 9th St.	9	Water Main at 9th St.
10	Water Main at 10th St.	10	Water Main at 10th St.
11	Water Main at 11th St.	11	Water Main at 11th St.
12	Water Main at 12th St.	12	Water Main at 12th St.
13	Water Main at 13th St.	13	Water Main at 13th St.
14	Water Main at 14th St.	14	Water Main at 14th St.
15	Water Main at 15th St.	15	Water Main at 15th St.
16	Water Main at 16th St.	16	Water Main at 16th St.
17	Water Main at 17th St.	17	Water Main at 17th St.
18	Water Main at 18th St.	18	Water Main at 18th St.
19	Water Main at 19th St.	19	Water Main at 19th St.
20	Water Main at 20th St.	20	Water Main at 20th St.

Notes: 1. All repairs to be made in accordance with the City of Los Angeles Water Main Repair Manual. 2. The water main is to be installed at a depth of 4 feet below the ground surface. 3. The water main is to be installed in a trench 4 feet wide and 4 feet deep. 4. The water main is to be installed in a trench 4 feet wide and 4 feet deep. 5. The water main is to be installed in a trench 4 feet wide and 4 feet deep.

# KNOTTER HEAD ASSEMBLY

USE SERIAL NUMBER WHEN ORDERING  
ALL REPLACEMENT PARTS.



Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	017—	Knotter Head Assembly	1	10	074013	Spring-Flat, knotter	2
2	017035	Knotter Head Sub Assembly	1	11	100131	Washer-Flat, No. 10	1
3	081020	Knotter Head Roller Stud	1	12	100192	Screw-Round head, 10-24 NC x 1 in. long	1
4	064008	Knotter Head Roller	1	13	032042	Lever-Knotter	1
5	020157	Star Wheel & Miter Gear Assembly	1	14	100009	Screw-Shoulder, knotter lever	1
5A	020018	Miter Gear	1	15	100143	Nut-Hex, 10-24 NC	1
5B	100547	Tapper Pin	1	16	100120	Screw-Set, socket head, cup point 10-32 NF x 5/16 in. long	1
6	082003	Plunger-Knotter lock	1	17	100017	Oil Cup	1
7	074006	Spring-Knotter lock	1	18	017—	Knotter Body & Miter Gear	1
8	100187	Screw-Set, Knotter lock, half dog point, 1/4-20 NC x 1 1/2 in. long	1	19 $\Delta$	011004	Pivot Assembly-Knotter Head	1
9	100150	Nut-Hex, knotter lock, 1/4 x 20 NC	1	20	100560	Nut 5/16-18 Nylon Insert	1
				21	100174	Roll Pin	1

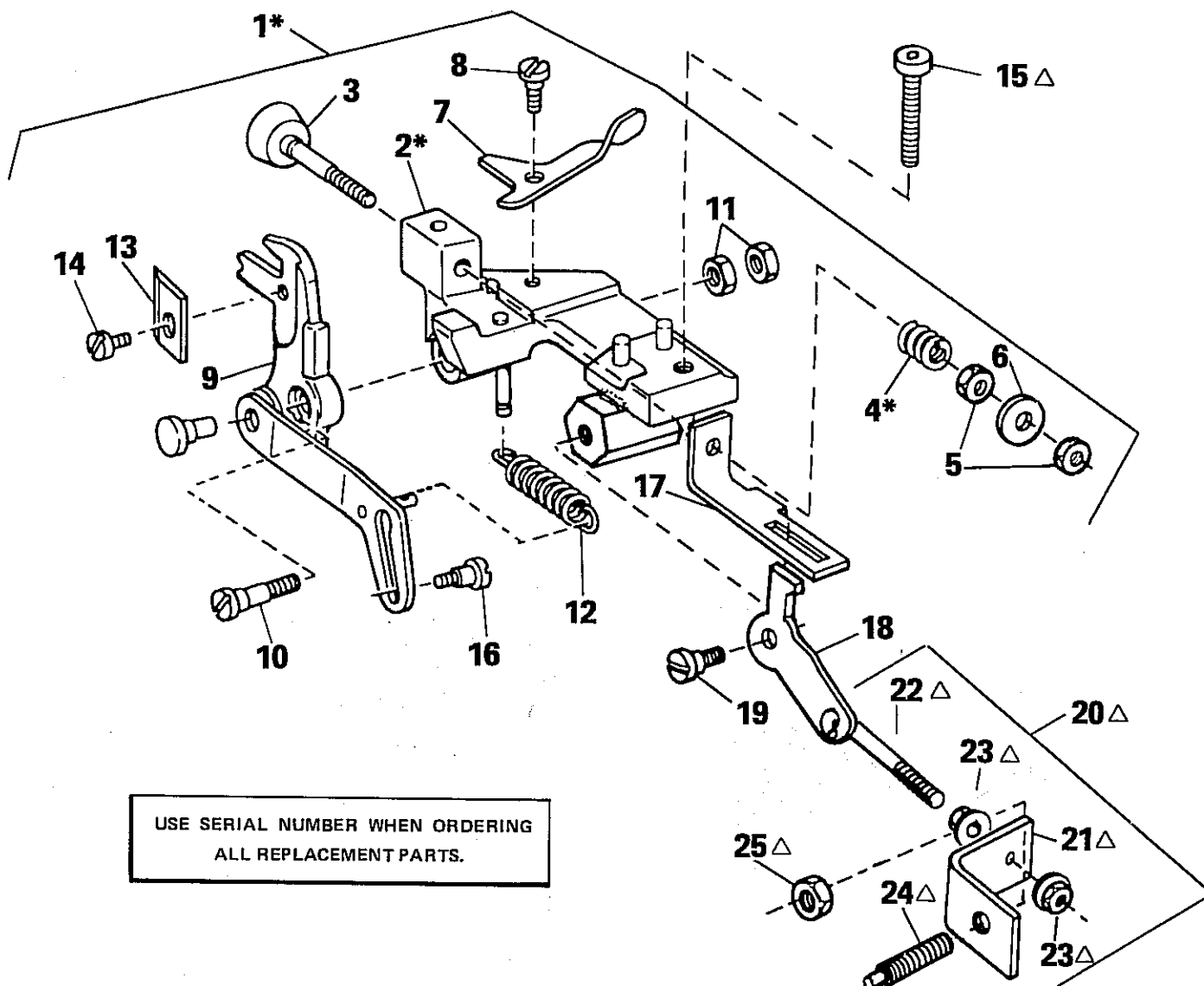
$\Delta$  Not Part of Assembly, Order Separately. \* Specify Type Twine or Tape Being Used.

NOTES: 1. Sub-Assembly includes Items 3 and 4; 2. Includes Items 5A and 5B.

[illegible]



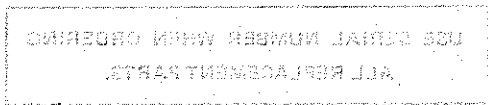
# **STRINGHOLDER AND KNIFE TRAP ASSEMBLY (DUAL TENSION)**



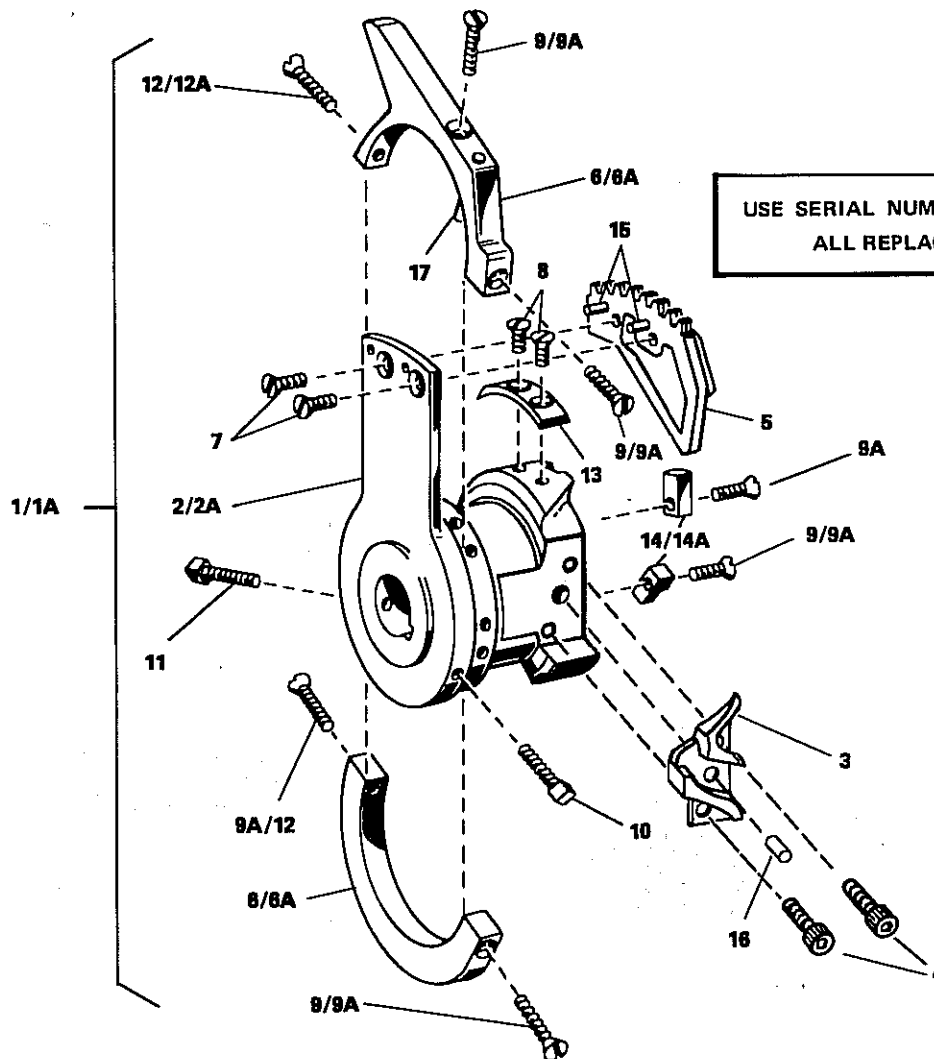
Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	030—	Stringholder and Knife Trap Assembly, Dual Tension	1	14	100090	Screw-Binder head, 8-32 NF x 1/4 in. long	1
2	030—	Stringholder and Pins Sub-Assembly, Dual Tension	1	15Δ	100565	Screw-Socket Hd. Cap, 5/16-18 NC x 1 1/4 in. long	1
3	030014	Button-Stringholder	1	16Δ	100011	Screw-Knife Trap Shoulder	1
4	074—	Spring	1	17	030084	Slide Lever	1
5	100144	Nut-Hex, 10-32 NF	2	18	030083	Pivot	1
6	100033	Washer-Stringholder Button	1	19	100088	Screw Pivot	1
7	032007	Lever-Button Release	1	20Δ	030031	Link and Angle Assembly	1
8	100010	Screw-Button Release Lever	1	21Δ	030085	Angle	1
9	032159	Knife Trap and Lever Assembly	1	22Δ	030086	Link	1
		Note	1	23Δ	100425	Nut-Hex Lock No. 12-24 NC	2
10	100562	Screw-Knife Trap, LH Thread	1	24Δ	100187	Screw-Set, half dog point, 1/4 x 20 NC x 1 in. long	1
11	100607	Nut-Hex 10-32, LH Thread	2	25Δ	100188	Nut-Hex, 1/4 x 20 NC ESNA	1
12	074011	Spring-Knife Trap	1				
13	021009	Knife (Package of 10)					

\* Specify Type Twine or Type Tape Being Used — Δ Not Part of Assembly, Order Separately.  
NOTE: Assembly does not include Items 13 and 14.

19920923 10000



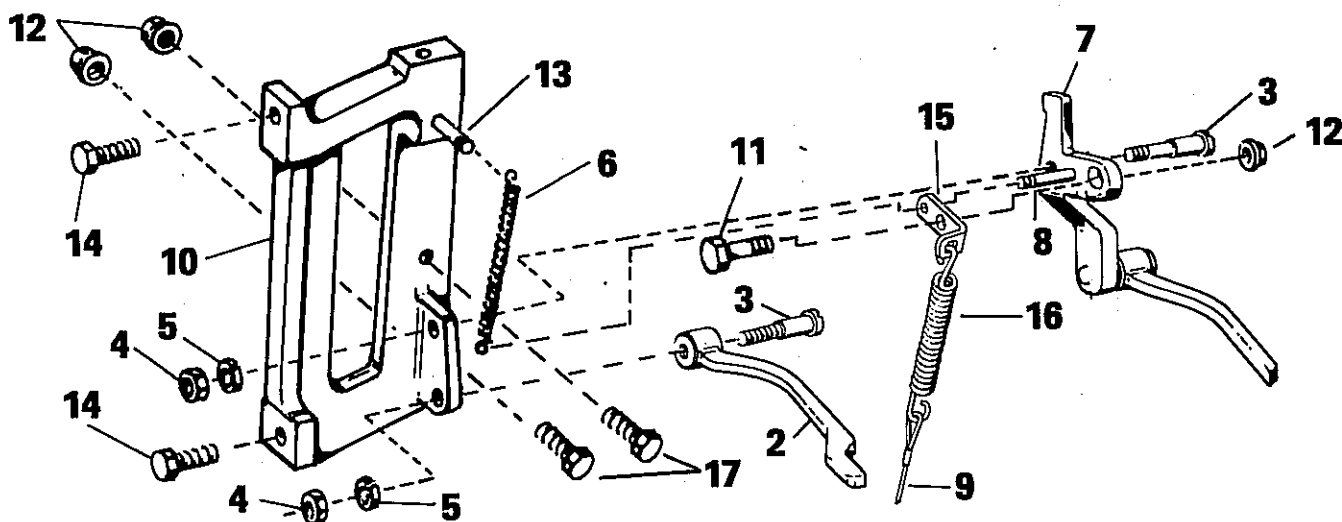
# MAIN CAM ASSEMBLY



Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	009106	Main Cam Assembly (0°), (Model 142E)	1	9A	100326	Screw-Machine, flat head, No. 10-24 NC x 7/8 in. long (Model 142X)	6
1A	009003	Main Cam Assembly, (0° - 148°), (Model 142X)	1	10	100128	Screw-Set, squarehead, cup point 5/16-18 NC x 1-1/4 in. long	1
2	009006	Cam Wheel, (0°), (Model 142E)	1	11	100127	Screw-Set, square head, cup point; 5/16-18 NC x 1/2 in. long	1
2A	009059	Cam Wheel, (0° - 141°), (Model 142 X)	1	12	100095	Screw-Machine flat head No. 10-24 NC, x 5/8 in. long (Model 142E)	2
3	009025	Switch-Knotter Head Cam (includes pin)	1	12A	100095	Screw-Machine, flat head, No. 10-24 NC x 5/8 in. long, (Model 142X)	1
4	100109	Screw-Socket head, cap 1/4-20 NC x 5/8 in. long	2	13	009014	Riser Cam	1
5	020135	Rack-Knotter Cam	1	14	009026	Clutch-Kickout Block, (Model 142E)	1
6	009107	Cam Drawslide (Model 142E)	1	14A	009026	Clutch-Kickout Block, (Model 142X)	2
6A	009078	Cam Drawslide (Model 142X)	1	15	100372	Roll Pin 1/8 x 3/4	2
7	100102	Screw-Machine, flat head, No. 12-24 NC x 3/4 in. long	2	16	100161	Groove Pin 3/16 x 1/2	1
8	100328	Screw-Machine flat head, No. 12-24 NC x 5/8 in. long	2	17	100160	Groove Pin 3/16 x 7/8	1
9	100326	Screw-Machine, flat head, No. 10-24 NC x 7/8 in. long (Model 142E)	5				



## MAIN TABLE SUPPORT AND KICKOUT ASSEMBLY



USE SERIAL NUMBER WHEN ORDERING  
ALL REPLACEMENT PARTS.

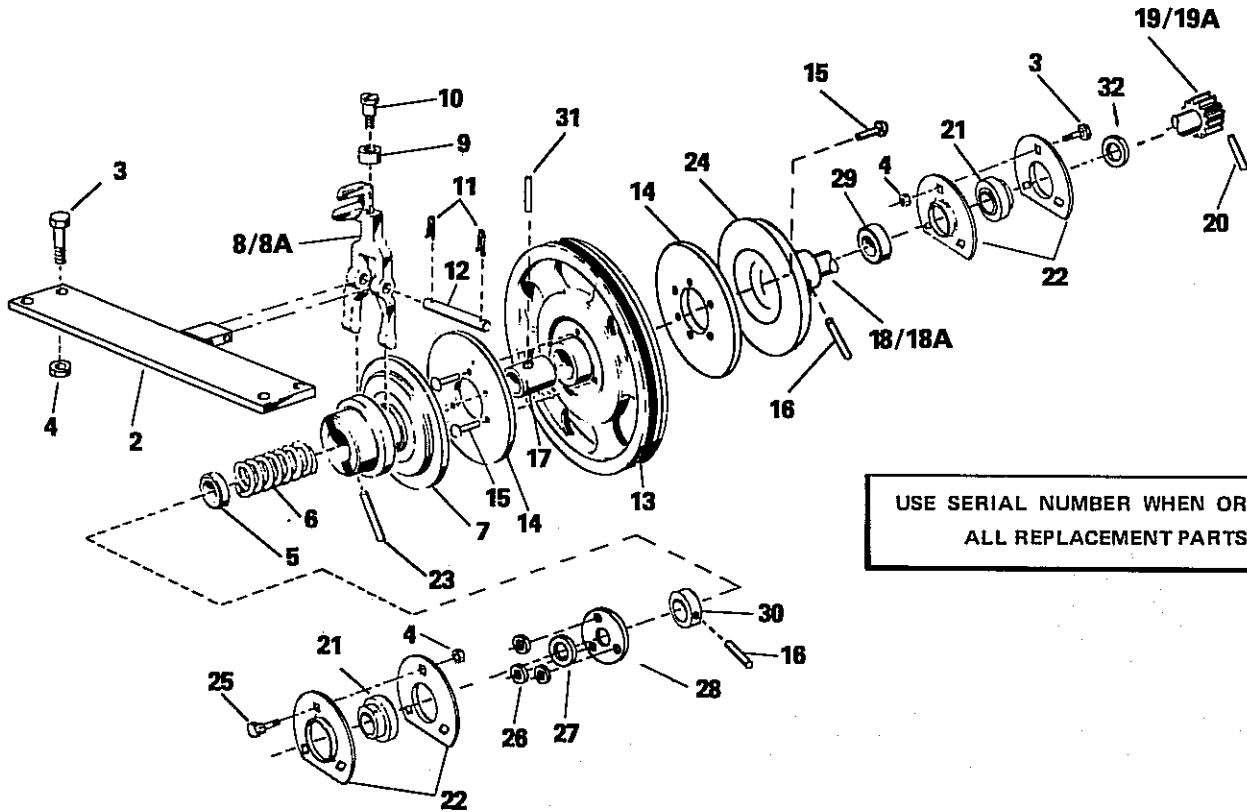
Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	084014	Main Table Support and Kickout Assembly	1	11△	100450	Screw-Hex Head, 1/4-20 NC x 1 in. long	1
2	032018	Lever-Clutch Kickout	2	12△	100286	Nut-Flanged Hex, 1/4-20 NC	3
3	100005	Screw-Trip Rod	2	13	100503	Groove pin, 3/16 dia. x 1 1/2 in.	1
4	100151	Nut-Hex, 1/4-28 NF	2	14△	100273	Screw-Hex, Head, 5/16-18 NC x 3/4 in. long "Whiz-Loc"	1
5	100135	Washer-Split Lock, 1/4	2	15	011034	Trip Extension	1
6	074054	Spring-Trip Return	1	16	074050	Spring-Trip Cable	1
7	011007	Bell Crank and Kickout Wedge Trip Assembly	1	17	100238	Screw-Hex 1/4-20 x 1 1/4 in. long	2
8	100158	Groove Pin 3/16 dia. x 1 in. long	1				
9	011022	Trip Cable-Clutch	1				
10	084048	Main Table Support Sub-Assembly, Note 1.					

△ Not Part of Assembly. Order Separately NOTE: 1. Includes Item 13. 2. Includes Items 12,13 and 17.



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# CLUTCH ASSEMBLY

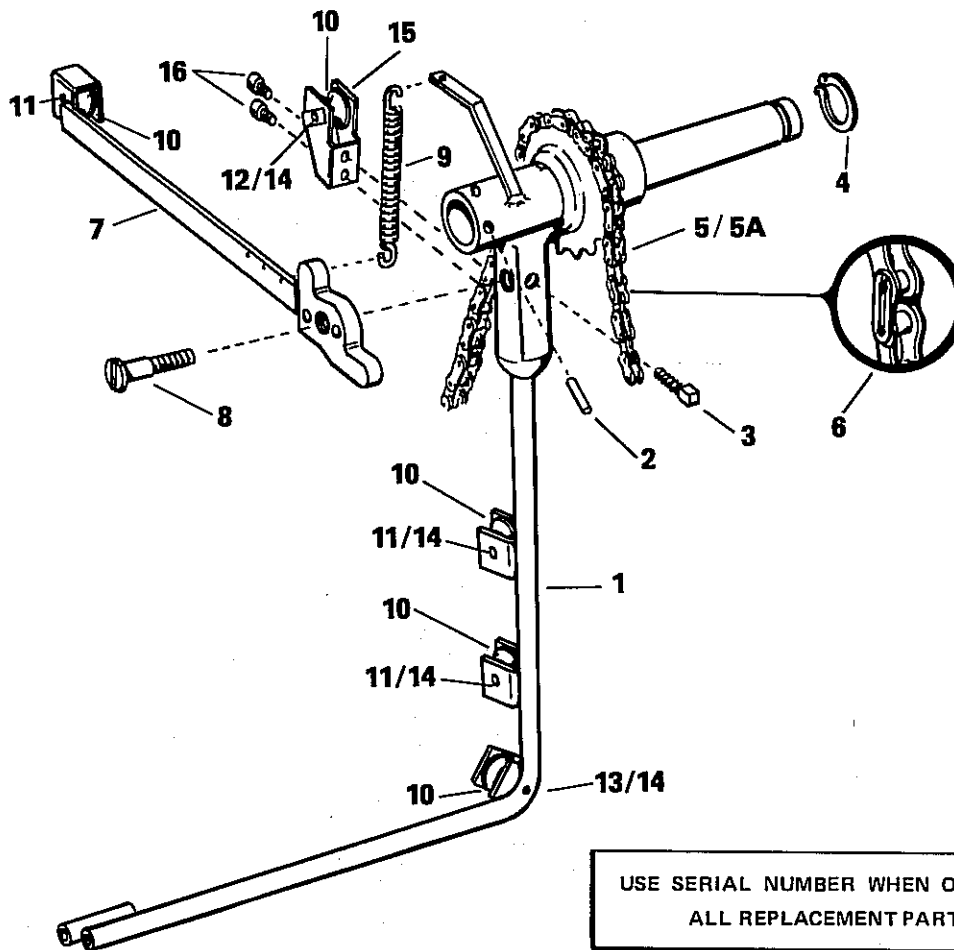


USE SERIAL NUMBER WHEN ORDERING  
ALL REPLACEMENT PARTS.

Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	019086	Clutch Assembly (Model 142E)	1	16	100294	Pin-Spirol 3/16 dia. x 1 3/4 in. long	2
1A	019087	Clutch Assembly (Model 142X)	1	17	013099	Bearing-Clutch	1
2Δ	025260	Bracket Assembly, Clutch Fork Pivot	1	18	012149	Shaft Clutch 142E	1
3Δ	100239	Screw-Hex head, 5/16-18 NC x 5/8 in. long "Whiz-Loc"	7	18A	012150	Shaft-Clutch 142X	1
4Δ	100284	Nut-Hex, 5/16-18 NC "Whiz-Loc"	10	19	020115	Pinion-Clutch Shaft 142E	1
5	094034	Collar-Clutch Shaft	3	19A	020147	Pinion-Clutch Shaft 142X	1
6	074004	Spring-Clutch (Export Only)	1	20	100497	Pin	1
6A	074003	Spring-Clutch (Domestic Only)	1	21Δ	013086	Bearing-Clutch Shaft	2
7	024002	Clutch Member-Outer	1	22Δ	013091	Bearing Flangette Clutch Shaft	4
8Δ	071001	Fork Clutch	1	23	083075	Groove Pin 3/16 x 1 1/4 in. long	1
8A	071004	Clutch Fork Assembly (Includes Roller & Screw)		24	024021	Clutch Member-Inner	2
9Δ	064002	Roller-Clutch Fork	1	25	100406	Screw-Hex head 5/16-18 x 1 in. long	3
10Δ	100002	Screw-Clutch Fork Roller	1	26	126075	Spacer Thrust Plate	3
11Δ	100297	Hitch-Pin No. 13	2	27	130189	Thrust Plate	1
12Δ	083056	Pin-Clutch Fork Pivot	1	28	024022	Disc	1
13	019093	Pulley, Grooved	1	29	094031	Collar-Clutch Shaft, Adjustable	1
14	024003	Clutch Disc	2	30	094030	Thrust Collar Clutch	1
15	100181	Drive Screw Round head No. 12 x 5/8 in. long	6	31	100601	Pin Rolled 3/16 x 7/8	1
				32	126076	Spacer-Clutch Shaft, 142X	1

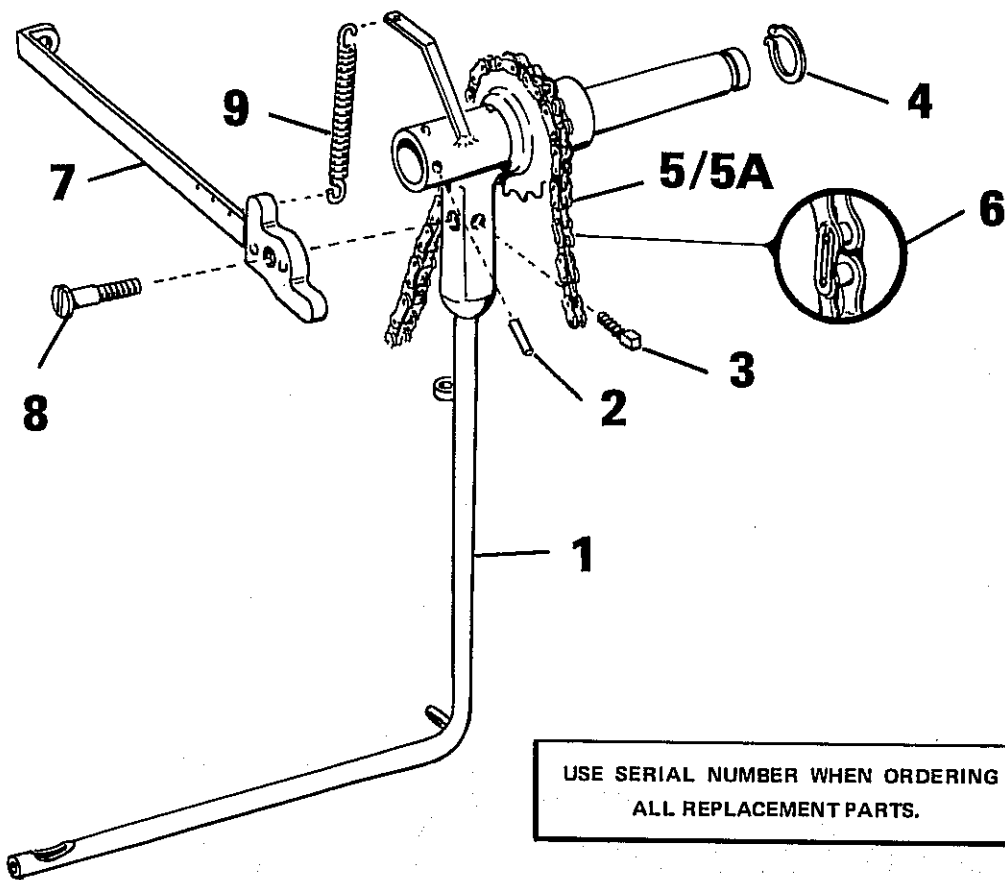
Δ Not Part of Assembly. Order Separately.

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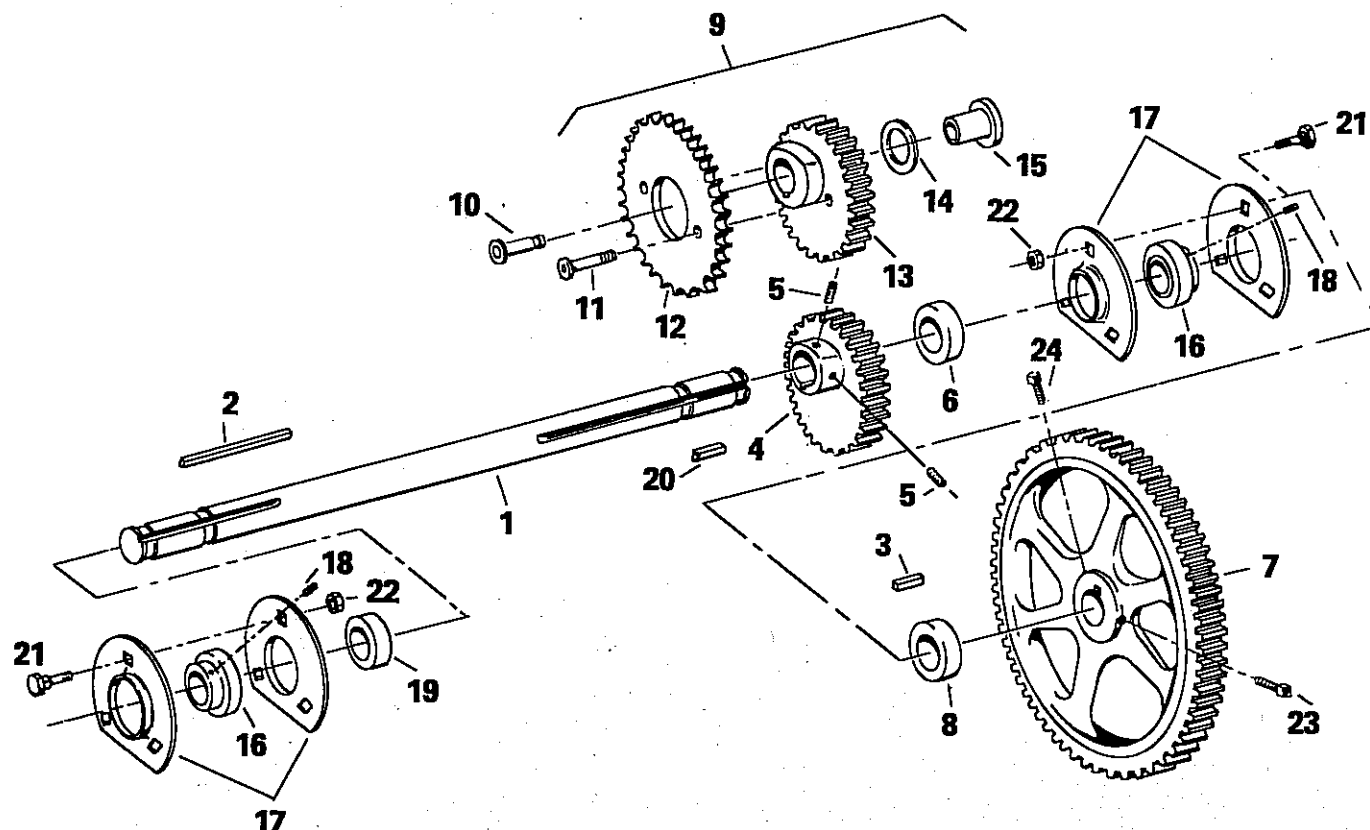
Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	041301	Twine Arm and Drawback Lever Assembly (with Rollers)	1	7	032146	Drawback Lever Assembly with Rollers)	1
2	100295	Pin-Roll 3/16 Dia. x 11/2 in. long	1	8	100014	Screw-Drawback Lever	1
3	100125	Screw-Set, Square Head, cup point 1/4-20 NC x 5/8 in. long	1	9	074019	Spring-Extension-Drawback	1
4	100052	Ring-Retaining	1	10	064033	Roller-Twine Arm	5
5	135009	Chain-Twine Arm Drive (Model 142E Only)	1	11	083018	Pin-Twine Arm Roller	3
5A	135053	Chain-Twine Arm Drive (Model 142X Only)	1	12	083019	Pin-Twine Arm Roller	1
6	135049	Link-Master	1	13	083020	Pin-Twine Arm Roller	1
				14	100609	E-Ring Roller Pin	10
				15	025309	Mounting Bracket Assembly	1
				16	100554	Screw 10-32 x 3/8 Socket Head Cap	2

# EYELET TWINE ARM & DRAWBACK LEVER ASSEMBLY



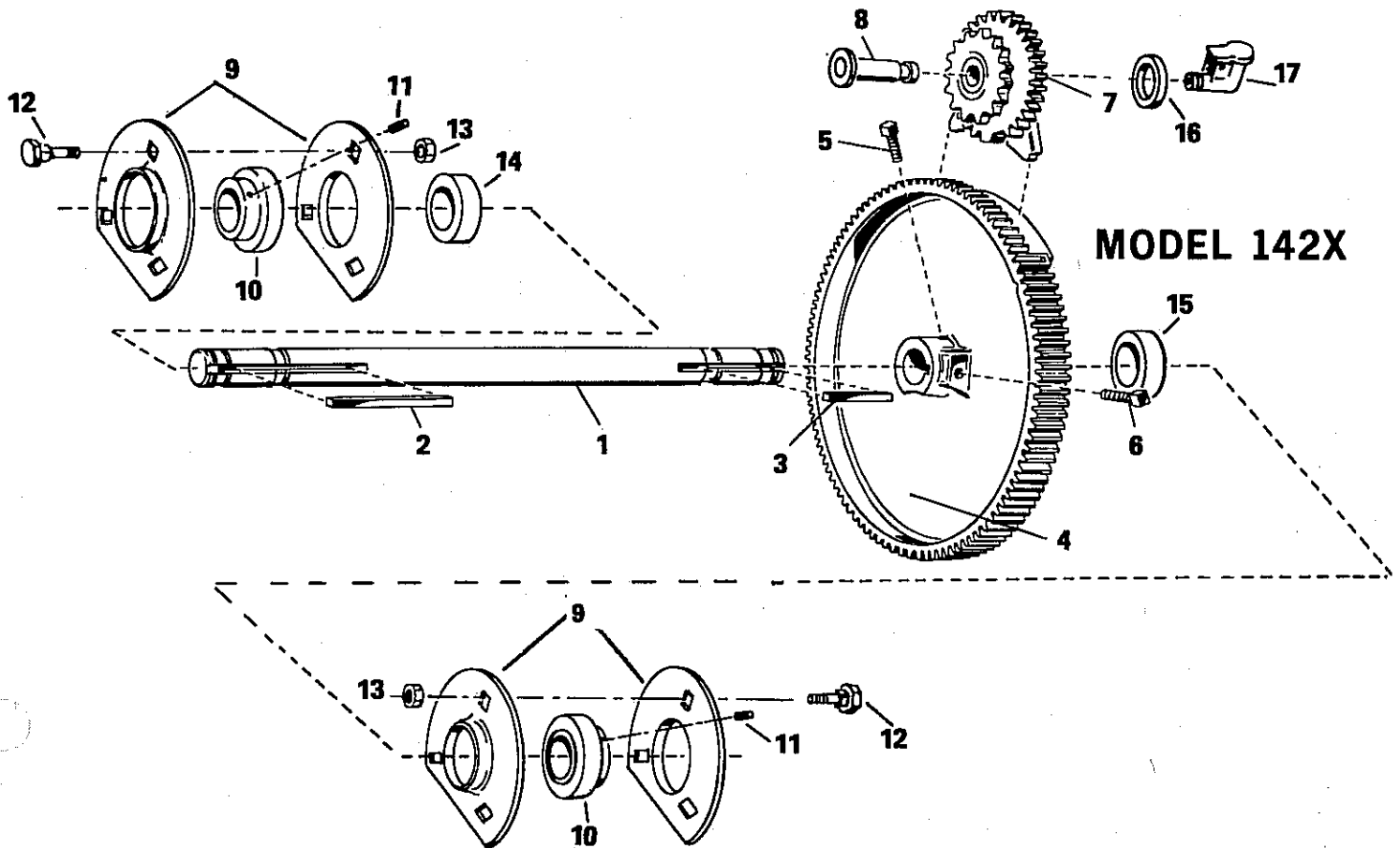
Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	041295	Twine Arm and Drawback Lever Assembly with eyes	1	5	135009	Chain-Twine Arm Drive (Model 142E Only)	1
2	100295	Pin Roll 3/16 Dia. x 1 1/2 in. long	1	5A	135053	Chain-Twine Arm Drive (Model 142X Only)	1
3	100125	Screw-Set, Square Head, cup point 1/4-20 NC x 5/8 in. long	1	6	135049	Link-Master	1
4	100052	Ring-Retaining	1	7	032113	Drawback Lever Assembly	1
				8	100014	Screw-Drawback Lever	1
				9	074019	Spring-Extension-Drawback	1

# MAINSHAFT, MAIN GEAR & CHAIN GEAR ASSEMBLIES (MODEL 142E)



Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	012121	Main Shaft	1	13	020103	Elliptical Gear (upper)	1
2	083057	Key-Cam Wheel	1	14	100316	Shim-Chain Gear Assembly	1
3	083009	Key-Main Gear	1	15	013048	Bearing Gear	1
4	020109	Elliptical Gear (lower)	1	16	013070	Bearing Main Shaft	2
5	100262	Screw-Socket Set Knurled, cup point, 5/16-18 NC x 3/8 in. long	2	17	013092	Bearing Flangette Main Shaft	4
6	126064	Spacer-Elliptical Gear (to rear bearing)	1	18	100259	Screw Socket Set Knurled Cup Point, 1/4-28 NF x 1/4 in. long	4
7	020113	Main Gear	1	19	126058	Spacer Main Cam Assembly (to front plate)	1
8	126065	Spacer-Main Gear (to rear bearing)	1	20	083010	Key-Elliptical Gear (lower)	1
9	020101	Chain Gear Assembly	1	21	100239	Screw Hex Head 5/16-18 NC x 5/8 in Long "Whiz-Loc"	6
10	081072	Stud Assembly-Chain Gear Pivot	1	22	100284	Nut Hex 5/16-18 NC, "Whiz-Loc"	6
11	100268	Screw-Flat Head Socket Cap, 1/4-20 NC x 1 1/4 in. long	2	23	100127	Screw, 5/16-18 x 1 1/2 Sq. Hd.	1
12	020099	Sprocket-Chair Drive	1	24	100128	Screw, 5/16-18 x 1 3/4 Sq. Hd.	1

# MAINSHAFT, MAIN GEAR & CHAIN GEAR ASSEMBLIES (MODEL 142X)

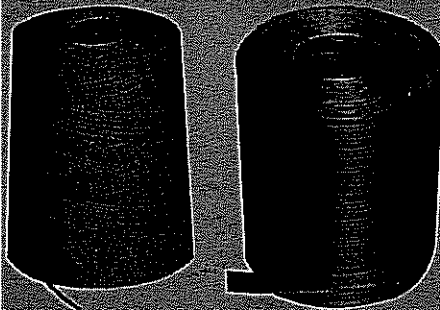


Index Number	Part Number	Description	Number Required	Index Number	Part Number	Description	Number Required
1	012124	Main Shaft	1	10	013070	Bearing-Main Shaft	2
2	083057	Key Cam Wheel	1	11	100259	Screw-Socket Set Knurled, cup point 1/4-28 NF x 1/4 in. long	4
3	083074	Key Main Cam Gear	1	12	100239	Screw-Hex head 5/16-18 NC x 5/8 in. long, "Whiz-Loc"	6
4	020006	Gear Main Cam Wheel	1	13	100284	Nut-Hex 5/16-18 NC "Whiz-Loc"	6
5	100369	Screw, square head, cup point 5/16-18 NC x 5/8 in. long	1	14	126058	Spacer-Main Cam Assembly (to front plate)	1
6	100339	Screw, Square head, cup point 5/16 x 18 NC x 1 in. long	1	15	126066	Spacer-Main Gear	1
7	020188	Chain Gear Assembly	1	16	126067	Spacer-Chain Gear	1
8	081072	Stud Assembly-Chain Gear Pivot	1	17	100087	Cup-Oil, 90°	1
9	013092	Bearing Flangette-Main Shaft	4				

## MISCELLANEOUS

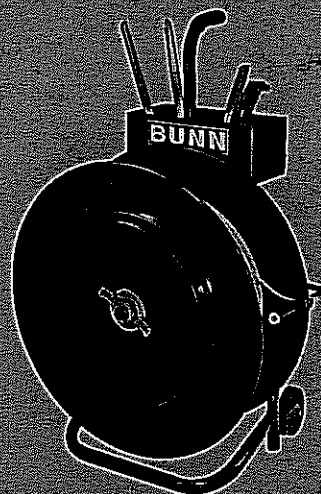


# BUNN YOUR COMPLETE SUPPLIER FOR:



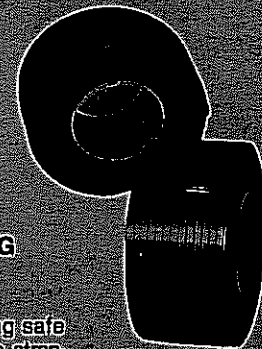
## TWINES OF ALL KINDS

Bunn has the right tying twines for every job. Cottons, rayons, nylons, poly tapes and heavy-duty twines with a complete selection of tensile strengths. BUNN twines have high speed quality characteristics that are guaranteed to match your machine performance. BUNN also has heavy-duty plastic twines for hand tying. Soft, smooth, kind to hands, and comes in handy container-feed cartons.



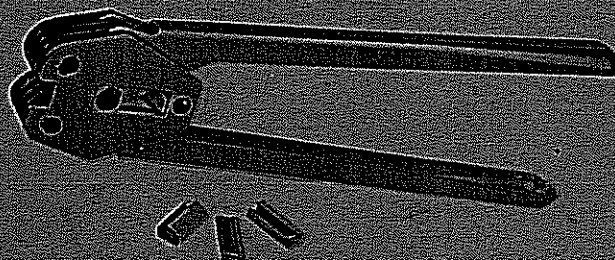
## BH-863—DISPENSER

Portable unit accommodates plastic strapping on a variety of core sizes. Handy built-in storage bin for strapping accessories.



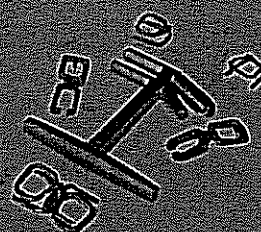
## STRAPPING MATERIAL

Bunn's strong safe polypropylene strapping gives you the strength of steel or wire without paying the price. Its smooth edge won't cut worker's hands or damage packages or bundles. Customers will appreciate your thoughtfulness when they receive undamaged merchandise strapped in Bunn "Polyweld" strapping. Strapping that's strong yet cuts easily with a knife or scissors. Disposes as easily as paper. And gives you no handling or safety problems.



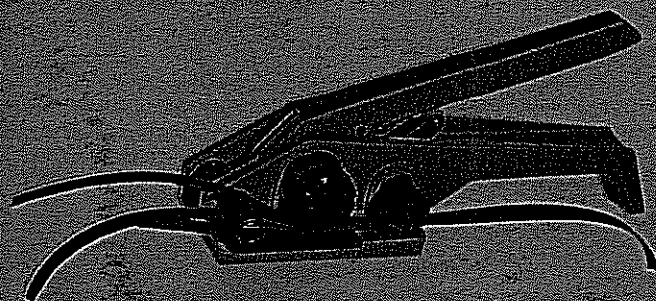
## BH-13CSS—CRIMPER

Patented for high seal efficiency using BUNN open or closed 1/2" metal seals. Rugged construction provides smooth crimping operation.



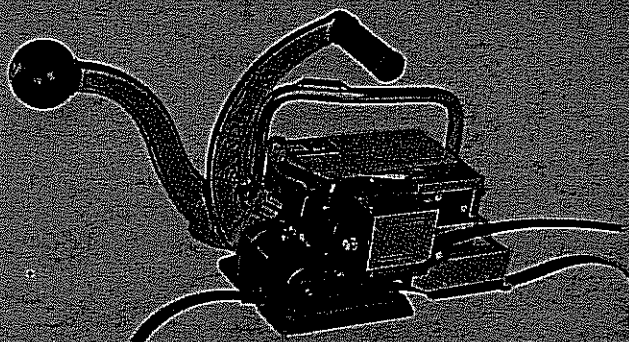
## HANDY-STRAP KIT

Low cost easy method strapping operation. Consists of self-dispenser carton with 9000 feet coil of 1/2" BUNN plastic strap having tensile strength of 375 lbs. Also contains hand tensioner-cutter and 400 wire or poly buckles.



## BH-26C—TENSIONER

Specially designed for use with all sizes of BUNN plastic strapping. Automatic clamping and releasing allows one-hand operation. Precision engineered for maximum reliability and efficiency with seals and buckles allowing unlimited take-up.



## BH-51H—TENSIONER WITH HEAT SEAL

Tension is achieved around any type of package in seconds with maximum joint seal efficiency. Can be used with any size of BUNN plastic strapping applying up to 800 lbs. of tension. Operates from 110 volt ac source.