



FINEST QUALITY

Union Special[®]
LEWIS • COLUMBIA

INDUSTRIAL
SEWING
MACHINES

INSTRUCTIONS
FOR
INSTALLING AND OPERATING
STREAMLINED, HIGH SPEED
FLAT BED MACHINES
IN
CLASSES

51200	51800	53100
51300	51900	53500
51400	52100	53700
51500	52400	53800
51600	52700	54200
51700	52800	54400
	52900	

CATALOG
No. 89
Second
Edition

Union Special MACHINE COMPANY
CHICAGO

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Second Edition

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Union Special
INDUSTRIAL SEWING MACHINES
MACHINE COMPANY
CHICAGO

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FOREWORD

Union Special's 50000 Series of Streamlined High Speed Flat Bed Machines is the latest design in industrial sewing equipment.

Maximum speed and lowest cost production are made possible with light weight needle bars, driving mechanisms, and presser bars. Maintenance is simplified by automatic lubrication, with a pump for returning filtered oil to main reservoir. Complete interchangeability is assured by precision manufacturing of all parts.

Our constant purpose is to supply carefully prepared information so customers can secure all possible advantages from their Union Specials. These pages contain valuable installing and operating data for Class 50000 machines.

Additional catalogs, containing specialized information, are available upon your request. Please ask for:

Catalog No. 104 L (Second Edition) for Classes 51200, 51300, 51400, 51500, 51700, 51900.

Catalog No. 111 L for Class 52800.

Catalog No. 97 N for Class 52900. (Front Disposal)

Catalog No. T97 P for Class 52900. (Rear Disposal)

Catalog No. 100 L (Second Edition) for Classes 53700, 53800.

Catalog No. 102 L (Second Edition) for Classes 54200, 54400.

Catalog No. 45 Needle Manual.

Form 357 Engineering Department Adjusting Instructions. Please specify Style for which Adjusting Instructions are required.

Union Special representatives will be found in all manufacturing centers, anxious to cooperate with you to plan and estimate requirements.

Union Special MACHINE COMPANY

Engineering Department

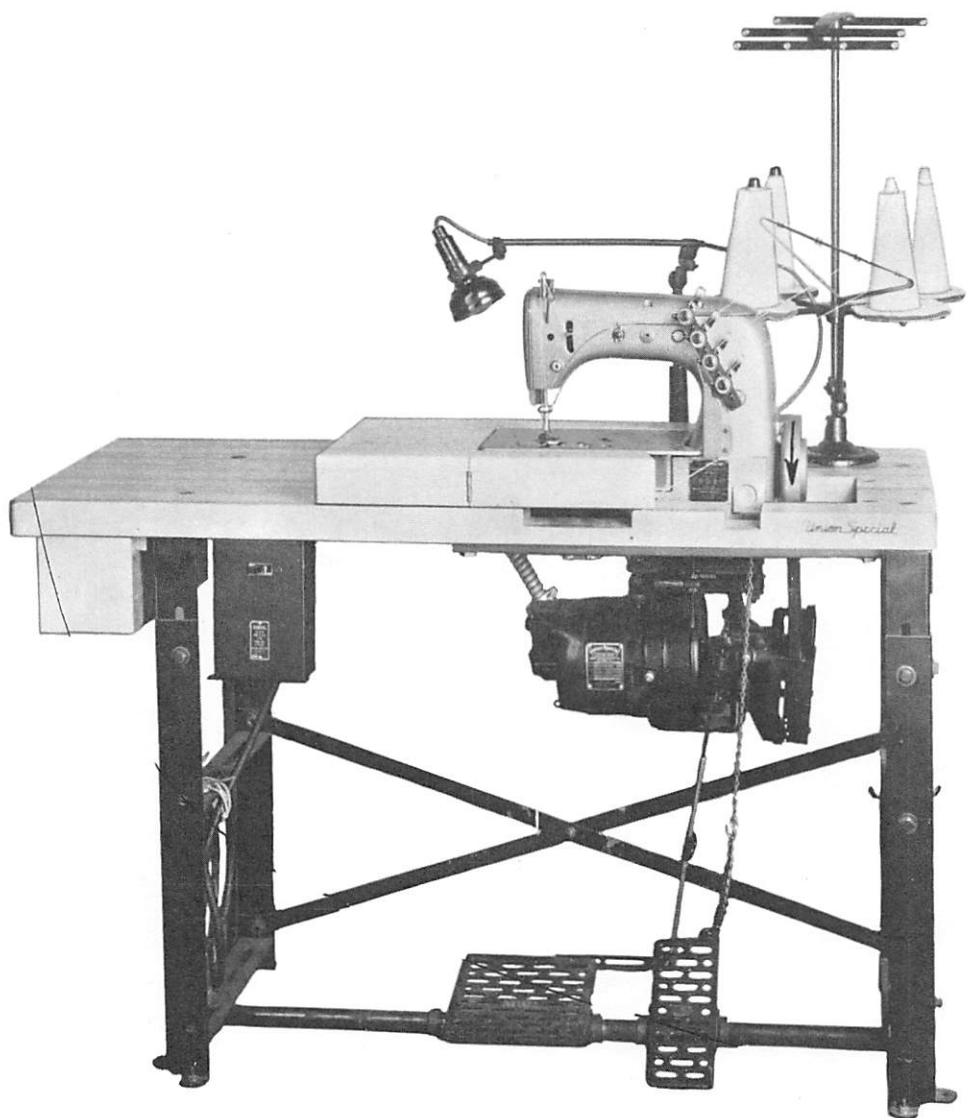


Figure 1

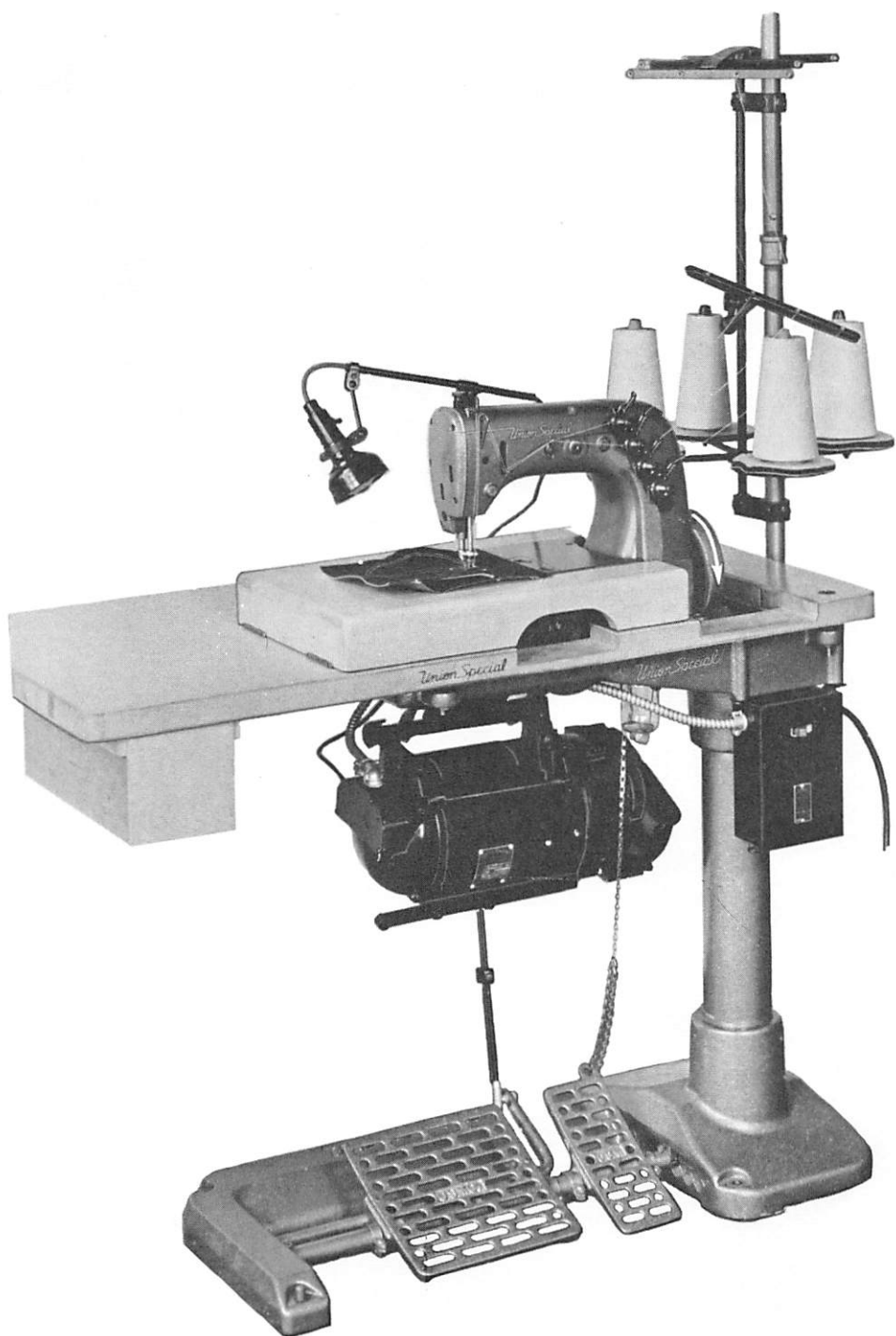


Figure 2

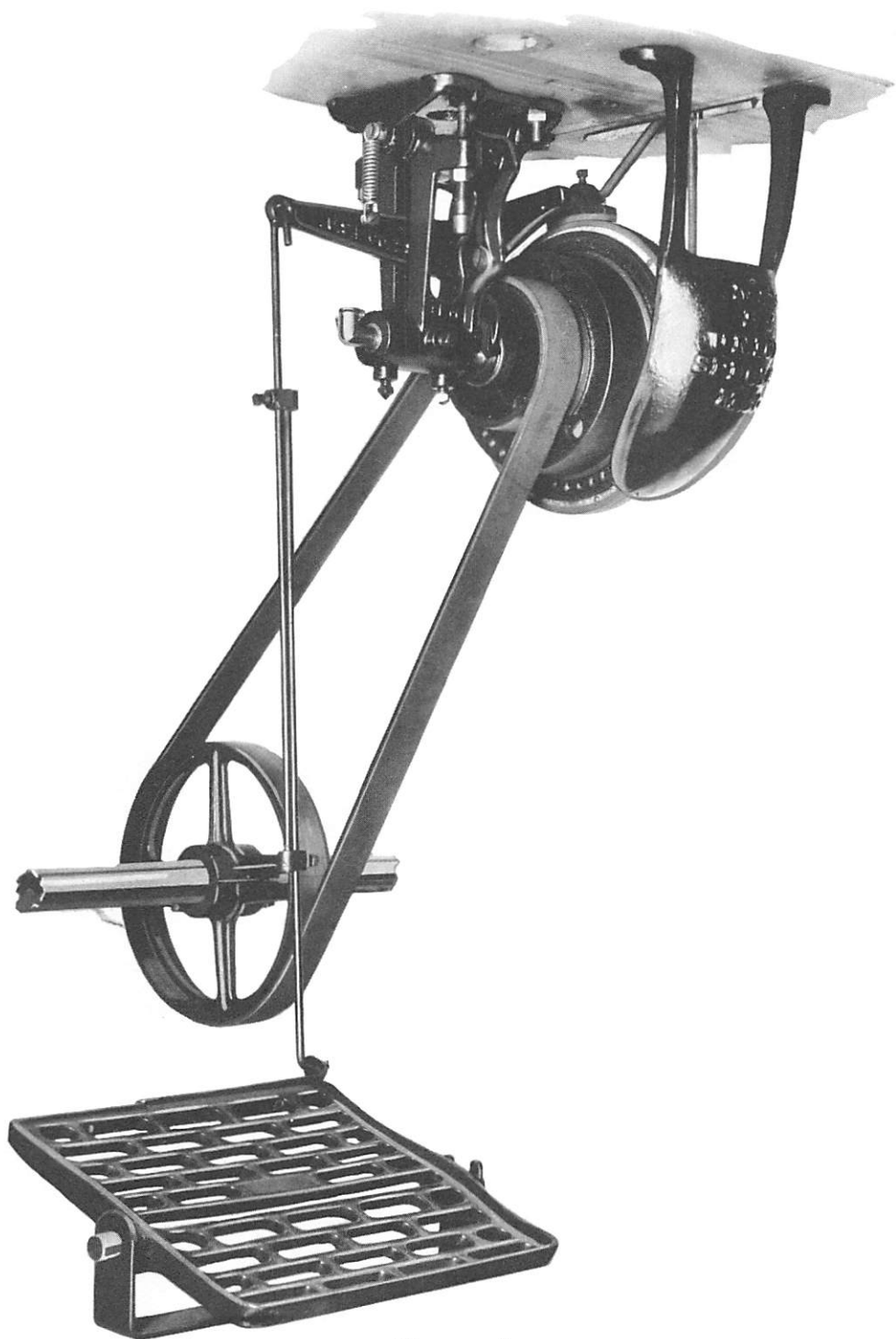


Figure 3

I N S T A L L I N G

GENERAL PLAN

Fig. 1, page 4, shows the general plan of a semisubmerged individual power table installation with "Electro Drive." Direction machine rotates is indicated by arrow.

Fig. 2, page 5, shows the general plan of a semisubmerged pedestal installation with "Electro Drive." Direction machine rotates is indicated by arrow.

Fig. 3, page 6, shows the Union Special Transmitter No. 28636 AA.

MACHINE READY TO OPERATE

Before shipment each Union Special machine is thoroughly run in, accurately adjusted, carefully inspected. Test sewn sample in machine is evidence of this work. Skillfully packed, your Union Special arrives ready to operate.

CAUTION!

When removing machine from its shipping box, do not remove the threads. Operator can use this threading. Merely tie these loose ends to the new threads to be used. Draw threads thru machine, and they are ready for sewing. It is safe to turn machine pulley one or two revolutions, as long as it is turned in proper direction.

INSTALLING

TABLE TOPS

For either group or individual power table installations, Union Special has prepared table tops, with all holes properly bored.

The following finished wood table tops for group or individual power table installations are available for immediate shipment:

- Dimensions - Lengths, 48 and 60 inches; widths, 16 and 20 inches; thickness, 1-3/4 inches.
- Designs - For nonsubmerged, individual power table, "Electro Drive" installations
For nonsubmerged, individual power table, "Electro Drive" installations, with Class 21700 puller
For semisubmerged, individual power table, "Electro Drive" installations
For semisubmerged, individual power table, "Electro Drive" installations, with Class 21700 puller
For fully submerged, individual power table, "Electro Drive" installations
For nonsubmerged, group, transmitter installations
For nonsubmerged, group, transmitter installations, with Class 21700 puller.
For semisubmerged, group, transmitter installations
For semisubmerged, group, transmitter installations, with Class 21700 puller
For fully submerged, group, transmitter installations
For fully submerged, group, transmitter installations, with Class 21700 puller.

It is better to install new prepared table tops for semisubmerged or fully submerged installation.

For the E1400 pedestal installation, Union Special has prepared two table tops, with all holes properly bored. Semisubmerged or fully submerged table tops are available.

- Dimensions - Length, 42 inches; width, 20 inches; thickness, 1-1/4 inches.

For group installations, any sewing machine table of ordinary construction can be used.

I N S T A L L I N G

INDIVIDUAL POWER TABLES

Individual power tables are shipped "knocked down." Enclosed with each stand No. 21371 NK is a sketch showing assembly of stand and table top (PL277).

Fig. 1, page 4, shows an assembled power table. Symbol No. 21371 NK is for stand only. To illustrate a complete individual power table installation, other items are shown; such as table top, drawer No. 21371 Q, foot lifter treadle No. 29480 AA.

DIRECTIONS: First assemble table top support members, treadle support tube, cross braces, according to PL277. Assemble isolators in table top support members. At this point invert table top and attach "Electro Drive" to holes provided. Assemble table top to isolators in top support members. Square legs with table top; securely fasten braces. Attach drawer. Now table is ready for sewing machine.

PEDESTALS

Union Special pedestals are shipped assembled. Fig. 2, page 5, shows an assembled pedestal, No. E1400. There is also another style of Union Special pedestal, No. D1400, which is identical with the illustration except for a shorter machine support arm which facilitates circular operations.

BELTS

Machines with "Electro Drive" are equipped to run an endless No. 1 "V" belt, No. 21261 M. These belts are made in specified circumferences. Hanger supporting "Electro Drive" has a belt take-up to compensate for reasonable variations in belt circumferences.

For group installations, a 1 inch flat belt is recommended for driving transmitter, and a 9/32 inch round belt is recommended for driving machine.

INSTALLING

SPEEDS

The speed at which your machines can be operated efficiently is affected by many variable factors. Such factors are length of run, kind of material, resistance of material to needle penetration, skill of operator, and operation performed.

Please refer to our Engineering Department Adjusting Instructions, Form 357, for your particular machine.

PULLEY DIAMETERS

Speed variations are secured by using varying sizes of "Electro Drive" pulleys, line shaft pulleys, or American Safety Table Transmitter pulleys. Select a size that will give a speed closest to that required.

Working diameters of various pulleys are:

"Electro Drive" "V" belt pulleys are made in 1/8 inch sizes ranging from 2-1/8 through 4-1/2 inches diameters.

"Electro Drive" round belt pulleys are made in 1/4 inch sizes ranging from 1-3/4 through 6-1/2 inches diameters.

American Safety Table Transmitter pulleys are made in 1/2 inch sizes ranging from 6 through 10-1/2 inches diameters.

Machine pulley for No. 1 "V" or round belt, 2-1/2 inches diameter.

Machine pulley for No. 2 "V" belt, 2-3/4 inches diameter.

Transmitter driving pulley, 7 inches diameter.

Transmitter driven pulley, small cone, 3-3/4 inches diameter.

Transmitter driven pulley, large cone, 5-3/4 inches diameter.

Flat belt line shaft pulleys, No. 28601, are made in 6, 8, 9, 9-1/2, 10, 10-1/2, 11, 11-1/2, 12, 12-1/2, 13, 13-1/2, 14, 14-1/2, and 15 inches diameters.

INSTALLING

ELECTRO DRIVE WITH "V" BELT

PROBLEM: To find diameter of driving pulley to produce required speed on sewing machine when R.P.M. of driving pulley and diameter of machine pulley are known, with no allowance for belt slippage.

RULE: Diameter of driving pulley equals required speed of machine, times diameter of machine pulley, divided by driving pulley R.P.M.

EXAMPLE: 4600 R.P.M. equals required speed of machine
2-1/2 inches equals diameter of machine pulley
3500 R.P.M. equals speed of driving pulley

Then required diameter of driving pulley is:

$$\frac{4600 \times 2-1/2}{3500} \text{ equals } 3-1/4 \text{ inches.}$$

ELECTRO DRIVE WITH ROUND BELT

The rule is the same as "Electro Drive" with "V" belt, except for the addition of a 97% belt efficiency factor (3% allowance for slippage). Required diameter of driving pulley for "Electro Drive" with round belt is:

$$\frac{4600 \times 2-1/2}{3500 \times .97} \text{ equals } 3-1/2 \text{ inches.}$$

AMERICAN SAFETY TABLE DRIVE

Rule is the same as "Electro Drive" with round belt.

INSTALLING

UNION SPECIAL TRANSMITTER DRIVE

RULE: Diameter of line shaft pulley equals required speed of machine, times diameter of machine pulley, times diameter of transmitter driven pulley, divided by diameter of transmitter driving pulley, times R.P.M. of line shaft, times 94%.

EXAMPLE: 4600 R.P.M. equals required speed of machine
2-1/2 inches equals diameter of driven machine pulley
3-3/4 inches equals diameter of driven transmitter pulley
7 inches equals diameter of driving transmitter pulley
500 R.P.M. equals speed of line shaft
94% equals belt efficiency (6% allowance for slippage)
Required diameter for line shaft pulley is:

$$\frac{4600 \times 2\text{-}1/2 \times 3\text{-}3/4}{7 \times 500 \times .94} \text{ equals } 13 \text{ inches.}$$

INDIVIDUAL POWER TABLES AND MACHINE

Because Union Special table tops have all necessary holes bored, assembly of machines to table tops is very simple. Merely assemble isolators in their proper places in table top; then mount machine on isolators.

PEDESTALS AND MACHINE

Assembly of machines to pedestals is the same as for individual power tables.

INSTALLING

UNION SPECIAL TRANSMITTER AND MACHINE

These instructions assume the use of a new table top with all holes bored.

Insert 1/4 inch bolt from top side of table. Place front right hole of transmitter over bolt; tighten securely. This is sufficient for holding temporarily.

Transmitter is equipped with a pivot frame for regulating tension on the flat belt. To use this feature, loosen rear and tighten front belt adjusting screws. Then swing frame 1/2 inch out of vertical, toward line shaft. Fasten lock nuts to retain adjustment.

Now place pulley on line shaft; tighten only enough to bind. Measure length of flat belt needed to go around both line shaft pulley and transmitter pulley; cut belt 1-1/4 inch short to allow ample tension without readjusting transmitter frame. Place belt around line shaft and about ends on cone; drive in malleable iron belt lacing No. 21350, making sure lacing conforms to curvature of cone and that teeth are well clinched. Turn pulleys by hand to check whether belt runs true. If pulley fails to ride crowns evenly, error can be corrected by turning transmitter and at the same time laterally moving line shaft pulley. When set correctly: permanently secure transmitter to table by placing screws in remaining holes; tighten lineshaft pulley.

Assemble isolators in table top; mount machine on isolators. Measure length of round belt needed to go around both transmitter pulley and machine pulley. Cut belt 1 inch short; fasten with belt hook No. 21351. It may be necessary to cross round belt to acquire correct rotation direction of sewing machine.

Oil was drained from transmitter before shipment, so it is necessary to refill transmitter before applying power. Oil cup at left end of transmitter shaft is for this purpose. But first remove plug at right end of shaft to allow air to escape during filling. Entire shaft can be filled if thumb is held loosely over right opening while oil is put in through cup at left end. Quickly replace right end plug to retain oil in shaft.

I N S T A L L I N G

UNION SPECIAL TRANSMITTER AND MACHINE (Cont'd)

Remove tape from oil drain hole; assemble oil filter assembly in position shown on PL336, Oil Return Pump Assembly.

Fasten pulley guard to under side of table in front of transmitter pulleys, with about 1 inch clearance between.

For average size operators, center transmitter treadle directly under needles. Adjust length of pitman rod to give a comfortable slope to treadle. If more convenient for operator; treadle can be placed farther back, as pitman rod need not hang vertically.

Next, fasten lifter treadle assembly at right of transmitter treadle, having chain attachment end $3/4$ inch higher than transmitter treadle.

AMERICAN SAFETY TABLES AND MACHINE

Installation of machines on American Safety Tables is substantially the same as for Union Special Transmitter. A set of pulleys, No. 660-159, is available as an extra for leading lifter treadle chain away from transmitter or line shaft.

THREAD STANDS

All machines are equipped with thread stands. Figs. 1 and 2 show location and assembly of a typical thread stand. Thread stands with fewer seats should be located closer to machine for more favorable delivery of thread.

Exception: "H" type thread stands, which are standard accessories with all 50000 Series machines, do not fit pedestals: an adaptor is available on additional order. "M" type thread stands for pedestal installations are available on additional order.

O P E R A T I N G

USE GENUINE NEEDLES AND REPAIR PARTS

Success in the operation of this machine can be secured only with genuine Union Special Needles and Repair Parts as furnished by Union Special Machine Company, its subsidiaries and authorized distributors. These needles and parts are designed according to the most advanced scientific principles, and are made with utmost precision. Maximum efficiency and durability are assured.

Genuine needles are put up only in packages marked "Trade UNION SPECIAL Mark" at the top. Genuine repair parts are stamped with the familiar Union Special padlocks. Both trade marks are your guarantee of highest quality materials and workmanship.

OILING

Caution: Oil was drained from machine when shipped, so reservoir must be filled before beginning to operate. Oil capacity of the 50000 Series is 12 ounces. A straight mineral oil with a Saybolt viscosity of 200 to 250 seconds at 100° Fahrenheit should be used.

Machine is filled with oil at spring cap in top cover. Oil level is checked at sight gauge on front of machine, and should be maintained between red lines of gauge.

Machine is automatically lubricated. No oiling is necessary, other than keeping main reservoir filled.

Check oil daily before the morning start; add oil as required. Oil which has gone thru machine is filtered and pumped back into main reservoir, making frequent oilings unnecessary. Excessive oil in main reservoir is drained at plug screw directly under handwheel in main frame.

Please see Catalog No. 32 for oiling diagram covering Class 21700 pullers.

Transmitter has a one-shot oiling system through an oil cup at left end of the shaft. This system should be filled once a week.

OPERATING

CLEANING

It is necessary to keep machines as clean as possible, because accumulated lint and dust quickly absorb oil. Remove cloth plate and thoroughly clean machine at least once a week. Be sure to remove lint from oil holes and from slots between feed dog prongs.

SETTING THE NEEDLES

Needles have two grooves: on one side a short groove extending from shank to about 1/8 inch above the eye, or ending in a milled spot just above the eye; on opposite side a long groove extending from the shank to the eye.

On machines equipped with loopers traveling across the line of feed; insert needles into needle bar as far as possible, keeping long grooves to the front so needle eyes are in line with stitch direction.

On machines equipped with loopers traveling parallel with the line of feed (Styles in Classes 54200, 54400); insert spiral grooved needles into needle bar as far as possible, keeping spot above needle eye to the left so threads pass thru needle eyes from right to left.

THREADING

Figures 1 and 2, pages 4 and 5, illustrate how cones or spools of thread are positioned on thread stands, and the threads led into machines. Four cones of thread are shown, but the manner fewer or more threads are led into machine is substantially the same.

A diagram is furnished with each machine showing its correct threading. These diagrams are identified by "PL" numbers. Studying this diagram will prevent threading errors.

O P E R A T I N G

THREADING (Cont'd)

GENERAL DIRECTIONS: Position cones or spools; pass thread through thread stand eyelets. Tie new threads to thread ends left in machine; draw in new thread. If thread is no longer in machine, rethread according to "PL" diagram.

CAUTION: Each thread must be passed between its tension discs and kept drawn against tension post. Thread should never be wound or twisted completely around tension post.

TO BEGIN SEWING

About two and one half inches of thread should extend beyond the eyes of needles and loopers. Carry threads to rear. Place material to be sewn under presser foot; start machine. Machine will stop automatically when pressure on treadle is released. Machine will stop instantly when heel pressure is applied to near edge of treadle.

TO REMOVE MATERIAL

In order to remove work from machine without running off material, turn pulley in operating direction until needles are at their highest position. Raise presser foot. Pass a scissors under presser foot; draw off 3 or 4 inches of thread; then cut needle threads close to material. Now remove work; cut looper threads. This method of removing material draws cut ends of needle threads to the under side of material and ties them.

O P E R A T I N G

SUGGESTIONS

When a machine in proper adjustment does not work satisfactorily, some minor troubles could be the cause. Time might be saved by following these suggestions:

- (1) Check threading. Be sure it is the same as shown on "PL" diagram.
- (2) Remove all lint.
- (3) Check needles. Be sure they are set correctly, and inserted into needle bar as far as possible.
- (4) Remove needles. Be sure they are straight. The best test is to roll them on a flat surface; points should roll true.
- (5) Try a new set of needles.
- (6) Clean machine thoroughly. Give special attention to grooves in looper and feed dog.



Union Special®
INDUSTRIAL SEWING MACHINES

UNION SPECIAL maintains sales and service facilities throughout the world. These offices will aid you in the selection of the right sewing equipment for your particular operation. Union Special representatives and service men are factory trained and are able to serve your needs promptly and efficiently. Whatever your location, there is a Union Special Representative to serve you. Check with him today.

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