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## EC791 Cleaning and Adjusting your Sewing Machine

Helen Rocke

John C. Steele

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*Cleaning & Adjusting*

*Your*

*Sewing*

*Machine*



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.  
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE, AND THE UNITED  
STATES DEPARTMENT OF AGRICULTURE COOPERATING, W. V. LAMBERT,  
DIRECTOR, LINCOLN.

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## SEWING MACHINES

Helen Rocke and John C. Steele<sup>1/</sup>

The common household sewing machine as used by the average family should give 40 or more years of satisfactory service. Often it is considered worn out and is used very little or not at all when nothing more is needed than a thorough cleaning, oiling, and minor adjustments. Sewing machines are built with an ample adjustment to take up wear and, in most cases, only a few minor parts become worn enough that they must be replaced in order to put the machine in first class condition.

Many of the troubles experienced with these machines are caused from allowing dust, lint, thread, and gummed oil to collect on the working parts. This tends to make the machine run hard. Often it is impossible to make the adjustments that are necessary from time to time if the proper kind of sewing is to be done.

Regular and frequent cleaning will help keep a sewing machine operating easily and satisfactorily. Each time the machine is used, the lint and dust should be removed from around the working parts (those that can be reached without removing any of the plates). A small brush with bristles about one inch in length works very nicely. If a machine is used constantly, it should be thoroughly cleaned at least once each six months. With ordinary use, once each year should be sufficient.

No special tools or skills are needed by the homemaker to do this job of cleaning, oiling, and adjusting. This bulletin is prepared as a guide in cleaning, oiling, and correct adjusting of the sewing machine.

<sup>1/</sup> Material in this bulletin has been adapted from U.S.D.A. Farmers Bulletin No. 1944.

## The Instruction Book

The manufacturer's book of instructions should be with every machine. It contains both directions and illustrations. Refer to it often when cleaning. If the book for your particular machine has been lost, try to get another. Write to the manufacturer, giving him the name, serial number, and approximate age of the machine.

## Equipment and Supplies Needed

Pie tin for parts and cleaning fluid.

Small, medium, and large cabinet-type screw drivers (blade same width as diameter of shank).

Knife.

Pliers, light hammer.

Adjustable-end wrench.

Ice pick, long needle, large pin, or other sharp instrument.

Narrow paint brush or sash brush (bristles cut to 1/2 inch) or toothbrush.

Pint oil can for cleaning fluid.

Cleaning cloths.

Cloth for testing stitch.

Large can of cleaning fluid. (Best for this purpose is cleaning fluid obtained from dealers of oil products. No. 1 white kerosene may be used if cleaning fluid is not available.)

Can of household machine oil (the kind packaged by oil companies or sewing machine manufacturers).

## A Place To Work

When a thorough cleaning is to be given a sewing machine, pick a place that is out of the main line of traffic. Plenty of light is needed and should come over the left shoulder. Provide good ventilation as the fumes from the cleaning fluid make some persons ill. Never work in a room where there is an open flame.



Several thicknesses of newspapers on the floor and nearby walls will protect them from cleaner and oil. Folded newspapers in the cabinet space beneath the head of the machine will help keep cleaner and oil off the floor.

### THE CLEANING OPERATION

When removing parts, remember that "left is loose, and right is tight" on practically all screws, nuts, and bolts found on household equipment. It may be easier to remember that these parts turn the same direction as ordinary jar lids to loosen or tighten. Many times, it is advisable to put a few drops of cleaning fluid on each screw and allow it to soak several minutes before trying to remove the screw. If it still does not loosen easily, set a screw driver in slot, and tap sharply with a hammer. Use a wrench on nuts and bolts - never use pliers.



Left  
is  
loose



Right  
is  
tight

Follow the instructions below for taking off, step by step, the parts that must come off for cleaning. Do not take off other parts.

Note: Before removing any part, take a good look at it so as to get a mental picture of its relationship to other parts. This should be of help when putting the machine back together.

1. Remove spool of thread, bobbin, and rubber friction bobbin-winder ring (Figure 1). Put in machine drawer or lay them aside out of the way, where they will keep clean and not become soiled with oil or cleaner. The motor and wires of electrically driven machines should be covered to protect them from cleaning fluid and oil.

2. Remove needle and put in machine drawer. This is a safety precaution.

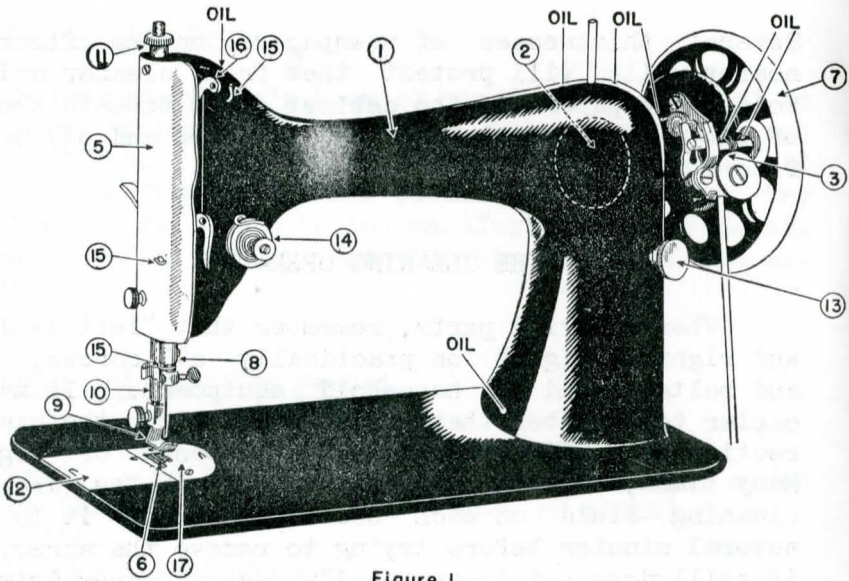


Figure 1

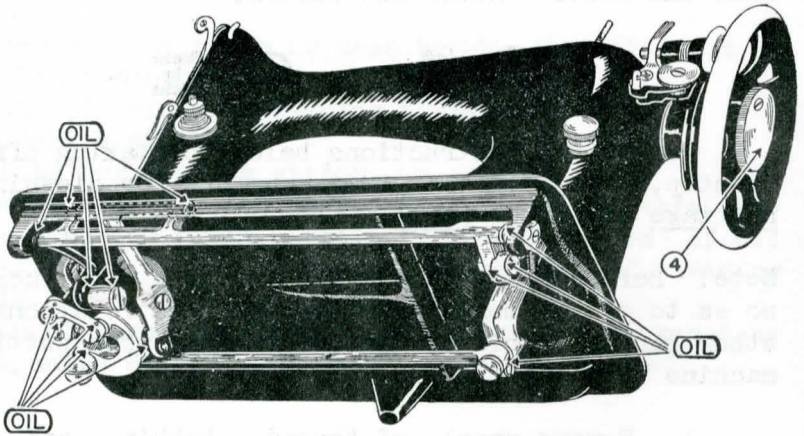


Figure 2

### Two Views of a Lock-stitch Machine.

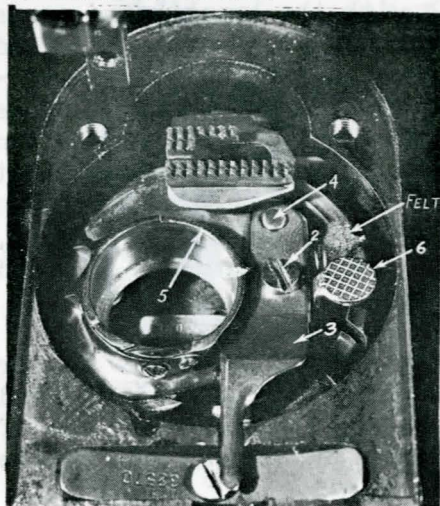
- |                              |   |
|------------------------------|---|
| 1. Arm.                      | 10. Presser bar.                        |
| 2. Armplate, or cover plate. | 11. Pressure-control screw.             |
| 3. Bobbin winder.            | 12. Slide plate.                        |
| 4. Clutch.                   | 13. Stitch-length control or regulator. |
| 5. Faceplate.                | 14. Tension.                            |
| 6. Feed dog.                 | 15. Thread guide.                       |
| 7. Handwheel.                | 16. Thread-take-up lever.               |
| 8. Needle bar.               | 17. Throat plate, or needle plate.      |
| 9. Presser foot.             |   |



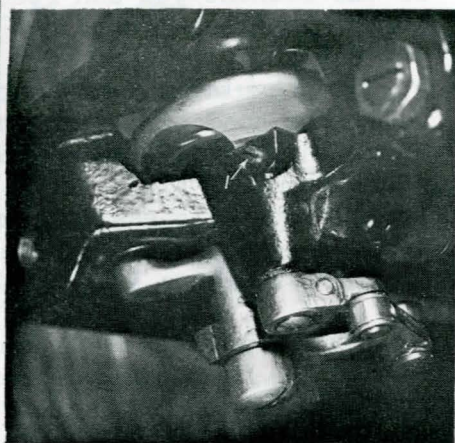
3. Remove and put in pie tin the following parts: Presser foot, slide plate or plates, bobbin case, throat plate or needle plate, armplate, or cover plate or plates, and the faceplate (Figures 1 and 2).

CAUTION: If a machine is one that has no faceplate, do not open or remove at this time the needle-bar housing, which is the left-hand end of the machine. This housing usually is held together with screws that show on the right-hand side of the housing (Figure 8). Special directions for removal are given on page 8.

4. Remove stitch mechanism of machines having a round bobbin lying in a horizontal position. This can be done by removing the various parts in the order indicated by the numbers in Figure 3. They are replaced in reverse order.



Top View



Bottom View

Figure 3 - Stitch mechanism on horizontal round bobbin mechanism.

With large darning needle, ice pick, or some other sharp-pointed instrument, clean out all oil holes (Figures 1 and 2). Then run the machine, and at the same time squirt cleaning fluid into all oil holes, on all bearings, and on all other places where one part rubs against or turns within another. Don't be afraid to use plenty of fluid.



WARNING: Do not run an electric machine by motor before all cleaning fluid has evaporated. A fire may start.

If the machine begins to run hard, it is a sign that dirt has rolled and jammed inside a bearing. Run the machine continuously until dirt and gummed oil are washed from bearings by continued applications of cleaning fluid and the machine runs easily again. Tip back the head and similarly flush the parts underneath (Figure 2). Let down the head and run the machine as before.

To remove any remaining gummed dirt and oil, pour some cleaning fluid into the pie tin with the parts. Dip the brush (with short stiff bristles) in the cleaning fluid and clean and scrub thoroughly all the parts of the machine you can reach with the brush - the parts in the needle-bar housing (Figure 4) - around the feed works - shuttle case and shuttle-driving mechanism - stitch regulator - all bobbin-winder parts - those under the head of the machine - and as far as you can reach inside the arm. Keeping gummed dirt and oil wet with cleaning fluid for a few minutes usually softens it so that it is easily removed with a brush. If not, it may be necessary to scrape the accumulated oil and dirt loose with a knife.

Use a pointed instrument, a knife, or screw driver to remove by digging or scraping, any gummed oil and dirt remaining around the feed dog - inside the tip of a long-bobbin shuttle - inside the round bobbin case (Figure 5).

Run the point of a fine needle or draw a thread under the spring of the lower tension on the shuttle or bobbin case to remove any thread or lint that may be wedged under the spring (Figure 6). You may need to remove the tension spring in some cases.

Most round-shuttle machines have a split piece of felt that rubs on the moving shuttle race for oiling

it. Soak this felt with cleaner and brush, but do not remove. Make sure it touches both sides of the shuttle race. In a long-bobbin machine, clean the race with a cloth wet with cleaning fluid.

Many long-bobbin machines have an oil well about one-fourth inch in diameter underneath the slide plate near the front end of the shuttle race. Take out and clean the wool material that holds the oil in this well. Then, with a pin, clean the small hole that leads from the oil well to the shuttle race. If the wool is dirty or missing or if some material other than wool has been put in this oil hole, put a fresh wad of either raw wool or wool yarn in the hole.

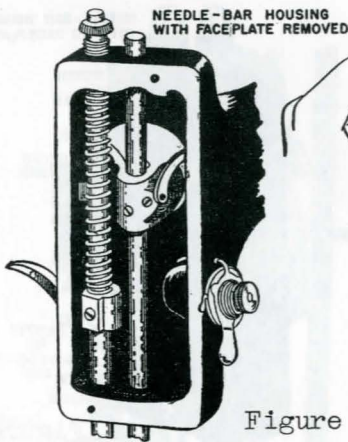


Figure 4

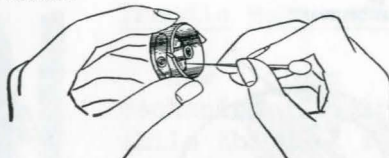


Figure 5

ROUND-BOBBIN CASE

LONG-BOBBIN SHUTTLE

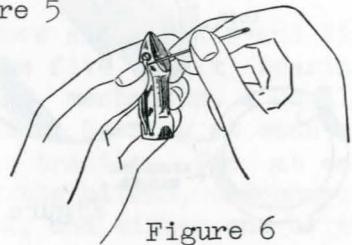


Figure 6

To clean the upper tension, pull a piece of cloth soaked in cleaning fluid back and forth between the disks or surfaces of the upper tension to polish them. Repeat with a dry cloth. Be sure no lint or thread remains wedged in it.

Unwind or pick out with a fine needle any thread that has wound around the bearings of the handwheel. Such thread may cause a machine to run hard.



Clean the clutch on the handwheel if the wheel does not turn freely without operating the rest of the machine when the lock nut is loosened. To clean the clutch, loosen screw A in the lock nut that holds the handwheel tight when sewing (Figure 7). Unscrew the lock nut, remove the adjusting washer or washers, and take off the handwheel. Clean and oil (one or two drops at most) the handwheel bearing. Replace the wheel, adjusting washer, and lock nut. Tighten screw A. Now turn the lock nut backward until the end of screw A bumps a lip on the adjusting washer, and see if the handwheel turns freely without running the machine. If not, again remove the lock nut, remove the adjusting washer carefully, and rotate it one-half turn. Replace the parts and tighten screw A. Check to be sure the handwheel turns freely when the lock nut is loosened.

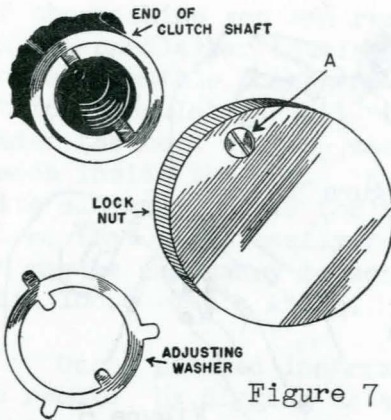


Figure 7

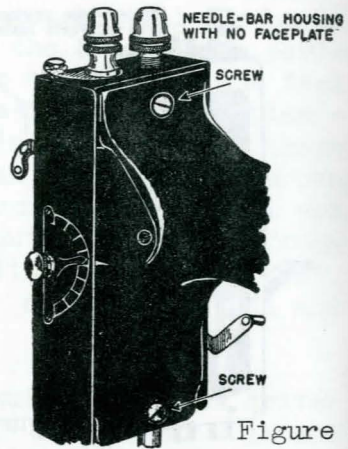


Figure 8

Now, if you have expert instruction or assistance, open the needle-bar housing on a machine without a faceplate. Be especially careful of those machines that have no feed dog. Be sure to unscrew only those screws that actually hold together the two parts of the needle-bar housing (Figure 8).

Watch carefully how the needle bar, presser bar, and small roller in the needle-bar cam drive come apart, so that you can remember where and in what order to put them back. Brush and clean these parts with the



cleaning fluid; wipe them dry. Also clean and wipe dry the inside of the needle-bar housing.

Oil all parts, wipe away any excess oil, and put back the parts immediately. If the roller is worn, it must be put back without reversing; otherwise, it may turn hard or stick.

If expert assistance is not available, and you hesitate to remove the needle-bar housing, a reasonably good job of cleaning can be done by squirting cleaning fluid in the oil holes in the top of the housing while running the machine. Use plenty of cleaner. A pie tin can be placed under the housing to catch the fluid. Allow an hour for drying before oiling.

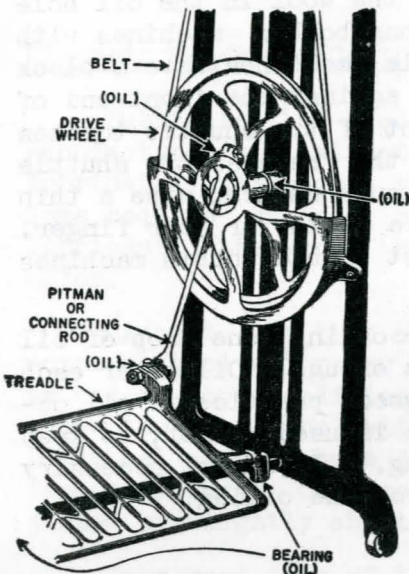


Figure 9

### Treadle Mechanism

Now clean the driving mechanism of a treadle machine while the head is drying.

Remove all threads and dirt from the five or six bearings of the mechanism. Usually there is a bearing at each end of the treadle, one at each end of the pitman, or connecting rod, and either one or two bearings supporting the band or drive wheel (Figure 9).

Squirt cleaning fluid into each bearing, operate the treadle mechanism, then wipe dry.

### Oil The Machine

The bearings should be thoroughly dry before they are oiled. When regular cleaning fluid has been used

an hour is usually sufficient time to allow for drying. If kerosene has been used as a cleaning fluid, let the machine dry for about 24 hours.

Squirt oil into all oil holes and wherever one surface rubs against or turns within another. Four or five drops of oil should be applied to each bearing, because all oil has been removed by the cleaning process. Never oil the tensions.

Run the machine to work the oil thoroughly into all the bearings. When oiling is completed, wipe all excess oil from all parts of the machine. This excess oil collects dust and lint. Too much oil on the shuttle race or needle can cause skipped stitches.

Be sure to oil any wool or felt that feeds oil to the shuttle race. Put oil on the wool in the oil hole under the shuttle plate of long-bobbin machines with such a hole. Some long-shuttle machines have a block of felt or ball of wool so set against the front end of the shuttle race that the point of the shuttle touches it and carries oil back along the race as the shuttle operates. On machines with no such device, wipe a thin film of oil on the race with a cloth or your finger. Saturate the split felt on most round-bobbin machines with oil.

Oil Regularly. - For later oiling, one drop of oil in each bearing and oil hole is enough. Oil after each 8 to 10 hours of use. It is good practice to oil occasionally, whether the machine is used or not, to keep the oil from drying and gumming. It is not necessary to remove the plates for this routine oiling.

### Replace Parts

After oiling the machine, clean, wipe dry with a clean cloth, and put back on the machine all parts that were placed in the pan. When you put them back, never force parts or screws into place. You may damage or break them. If a screw balks, probably it does not belong in that place. Again remember "left is loose;



right is tight" - or screws and nuts tighten if you turn them in a clockwise direction - just like a common jar lid.

Run the machine with some waste cloth under the presser foot to absorb excess oil from around the needle and feed works. Be sure the presser foot has been pushed back into its clamp as far as it should go so that the slot in the presser foot is directly above the needle hole in the needle plate and the sides of the slot are parallel to the sides of the feed dog.

Note: It is a good practice to keep a piece of scrap cloth under the presser foot with the needle through the cloth when not sewing. This will absorb any oil that may work down the needle shaft as well as protect the feed dog.

### Electric Motor and Control

Lubricate the electric motor according to the manufacturer's instructions. Some motors need to be lubricated only once a year; some need no lubrication. Some require grease; others, oil. Using too little lubricant, the wrong kind, or too much may ruin a motor.

Check to see that all electric connections to the motor control and motor are tight. If the cord covering is not in good condition, tape it, or if necessary, replace the cord. The belt that connects the motor to the handwheel should have just enough tension to keep it from slipping. On some machines the belt can be adjusted by slightly shifting the position of the motor.

Take good care of the rubber driving ring or wheel on motors that drive machines by friction contact with the handwheel. If this driving ring or wheel becomes flat-sided or unevenly worn, thus causing excessive vibration, replace it with a new one. Keep the handwheel clean and dry, the driving ring adjusted firmly to the handwheel and in line, and the machine will run with a minimum of vibration.



## ADJUSTING THE MACHINE

### Needle

Sewing-machine needles come in many styles, differing as to needle length and shape of shank. Each style of a given brand has its own number. Each style can be used in a number of different machines (see page 26).

The needle should be of the correct length, sharp and straight. It needs to be so set in the needle-holding clamp that the short groove on the needle faces the shuttle point or hook as it passes the needle (Figure 10). In all the newer machines the needle is set up against a stop pin in the needle bar.

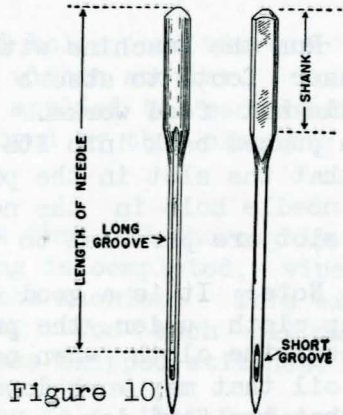


Figure 10

To make sure a needle is the right length, watch the shuttle as it crosses the needle during stitching. The point or hook of the shuttle should cross the needle so that the shuttle point enters the loop of thread at its broadest point to form the stitch. Too short or too long a needle or one set too high or too low causes skipped stitches. On some machines a needle that is too long will break or bend, or cause the upper thread to break.

The position of the needle bar needs to be adjusted if a straight needle, correctly set, enters near the edge instead of the center of the needle hole. On some machines without a faceplate, you can adjust the needle bar by loosening the screws that hold the front of the needle-bar housing and moving the housing until the needle does enter the center of the hole. Hold the housing firmly as you retighten the screws.

On the machines with a faceplate or with a needle-bar housing that separates at the needle bar, do not try to change the needle bar position without expert help.

### Threading

Refer to your instruction book. The thread should run from the spool to the upper tension, to the thread take-up, and then to the needle. Various guides hold the thread in the correct position as it feeds to those three main points - tension, take-up and needle. Pass the thread through the needle from the side with the long groove to the side with the short groove.

Place the bobbin in its case or shuttle. Pull the thread under the lower or bobbin tension, according to the instruction book. If the shuttle is not threaded correctly, the thread may catch and break, or loops may form in the stitching along the top side of the cloth. If the bobbin is put in the bobbin case incorrectly, the case may unthread.

### Stitch-Length Control

Different machines have different types of control for adjusting the length of stitch. This control should be free to move so that it can regulate the stitch over the entire range of stitch lengths possible on the machine.

### Tensions

Upper and lower tensions must be balanced to produce a perfect stitch. The upper tension varies in location on different machines. It may be on the faceplate, on the face of the needle-bar housing, on the front of the needle-bar housing, or on the upper arm of the machine head. It is adjusted by a thumb nut.



The lower tension, located on the shuttle or bobbin case, is adjusted by a screw. If two screws fasten the lower tension spring to the bobbin case, adjust by turning the screw nearest the center of the spring--not the screw on the end.

If, during the cleaning, the lower tension spring has not been removed or its adjustment changed, the adjusting procedure is the same as in the ordinary use of the machine. That is, assume the lower tension to be correct until proved wrong, and make all adjustments on the upper tension.

If the lower tension has been disturbed, set by guess both lower and upper tensions so there will be some drag on each thread. Use the same size thread on both bobbin and spool. Assume the lower tension to be correct until proved otherwise by tests, and make all adjustments on the upper tension.

Set stitch-length control for a medium length of stitch. Fold a 6- or 8-inch square of sheeting or average weight cloth and stitch diagonally across it at an angle of about  $45^{\circ}$  (Figure 11).

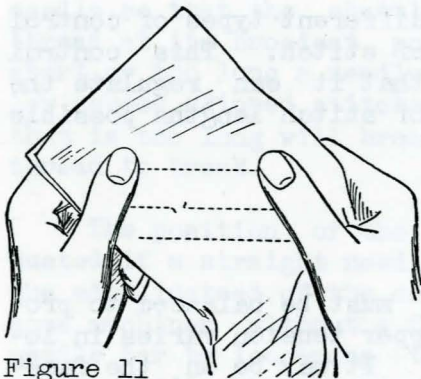


Figure 11

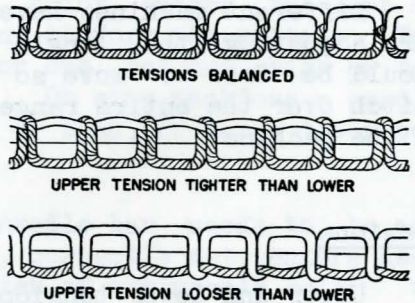


Figure 12



A perfect stitch will have threads locked in the center midway between the two layers of cloth, with no loops on the top or bottom of the seam and no puckers in the cloth (Figure 12).

To make a closer test of tension balance, grip the ends of the bias stitching between the thumb and first finger of each hand, pull evenly, strongly enough to break threads. One of four things happens, which shows the condition of the tensions:

1. The upper thread only may break. This shows that the upper tension is tighter than the lower.
2. The lower thread only may break. This shows that the upper tension is looser than the lower.
3. Both threads may break. This shows that the tensions are balanced. The stitch may be perfect. However, if the cloth puckers at the same time, both tensions are too tight.
4. Neither thread may break. This shows that the tensions are balanced but both are too loose.

Here is the way to make adjustments in the preceding cases:

1. If the upper thread breaks, loosen the upper tension by turning the adjusting nut about one-fourth of a turn to the left. Make another diagonal seam and test the stitch again. Repeat if necessary, changing the upper tension by slight turns until tensions are balanced - that is, until both threads break at the same time or until neither thread breaks. They may both need to be loosened or tightened as described in 3 or 4 below.
2. If the lower thread breaks, tighten the upper tension by turning the adjusting nut about one-fourth of a turn to the right. Make another diagonal seam and test as above.

3. If both threads break, no adjustment is needed, unless the cloth puckers. If the cloth puckers, loosen the lower tension first; then adjust the upper tension as in 1 above. Repeat the adjustments until the result is a perfect stitch - with tensions balanced and no puckering of the cloth along the seam.
4. If neither thread breaks, tighten the lower tension slightly. Then obtain a balance by tightening the upper tension a little at a time, as in 2 above.

### Tension Feed

The upper thread should feed into the tension regularly and smoothly. If it does not, take the upper tension apart. Remove each piece separately and place the parts in order where they will not be disturbed. You may find lint between the disks or that the thread has worn a groove in the metal. In this case, smooth and polish the surface of the disk on a fine emery stone or whetstone. In replacing the parts remember the tension disks belong with the flat sides together. If the tension spring is weak or broken it should be replaced.

### Thread-Take-Up Spring

Some machines do not have a thread-take-up spring. On those that do, it is a small spring usually located at or near the upper tension so that the thread passes through it after it leaves the upper tension and before it passes through the take-up lever. If the spring is broken or missing, replace with a new one. Two types of adjustments may be needed on the take-up spring to prevent staggered stitches.

1. Turn the handwheel slowly by hand and watch the action of the thread-take-up spring as the needle enters the cloth. If the spring comes to rest too soon, or after the needle enters the cloth,



locate and loosen the screw A that fastens the take-up-spring holder (Figure 13). Now rotate the holder until the correct adjustment is made and then tighten screw A. Since different machines adjust differently refer to your instruction book or study the machine carefully until you determine where the adjusting screw is located, and how to make the adjustments. It may not be possible to make this adjustment on some types of machines.

2. If the take-up spring seems weak and does not return to its stop position regularly, it needs another type of adjustment. On many machines the spring is held in place by the split bolt which passes through the tension disks. To adjust the spring remove the tension-adjusting nut, tension-adjusting spring and tension disks (Figure 14). Then replace the tension-adjusting nut on the split bolt to about the depth of the nut and unscrew the bolt with a screw driver. Replacing nut on the end of the bolt keeps screw driver from spreading the end of the bolt.

When the bolt is loosened, rotate the spring around the belt about one-fourth of a turn. Tighten the split bolt, and test the take-up spring to see if it now has the right amount of tension to draw the slack from the thread and always to return to its stop. If it is not yet correct, again loosen the split bolt

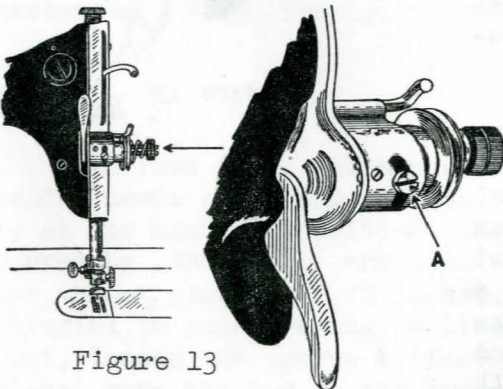


Figure 13

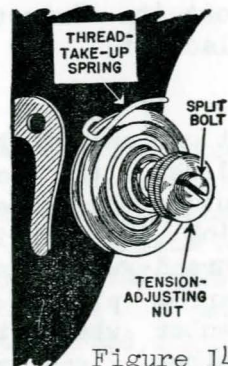


Figure 14



and rotate the spring so as to increase or decrease the tension as needed. Repeat this operation until the spring is adjusted so that it functions properly. Then reassemble the parts of the tension that have been removed.

If your machine is one in which the take-up spring is not held in the way described above, you can probably determine how to increase or decrease the tension on it by examining it carefully.

### Bobbin Winder

Check to see if the bobbin winder works as it should. If the bobbin winder has a rubber ring which does not press hard enough against the wheel to wind the bobbin, loosen the adjusting screw A, press the winder lightly against the hub of the handwheel; then tighten the adjusting screw (Figure 15).

Be careful not to get oil on the rubber ring. If the ring has lost its "stretch", replace it.

If thread piles up at one end of the bobbin, adjust the arm that guides the thread as you wind the bobbin. Most thread-guide arms have a narrow place near the center where they bend rather easily. With pliers, grip the arm

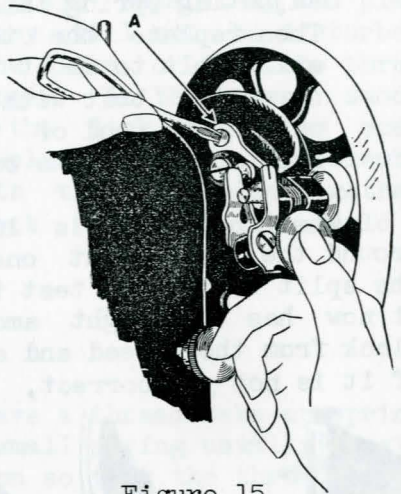


Figure 15

above this point and bend it away from the end of the bobbin at which the thread heaps up (Figure 16).

If the drive wheel of the bobbin winder on a long-shuttle machine will not turn the cam wheel, the cam wheel may need adjusting (Figure 17). Check to see if the canter bolt A, which is the bearing of the cam wheel, is gummed with dirt or has rotated out of adjustment. A slight turn of this bolt moves the cam wheel toward or away from the drive. Loosen the nut on the back end of this bolt, rotate the bolt with a screw driver until the teeth on the cam wheel engage the teeth on the bobbin drive, then tighten the nut. Check to see that the entire mechanism runs freely.

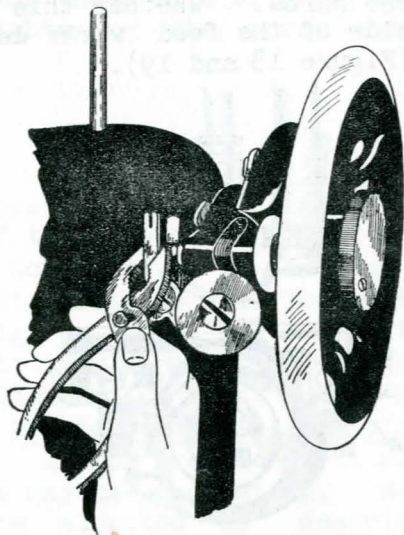


Figure 16

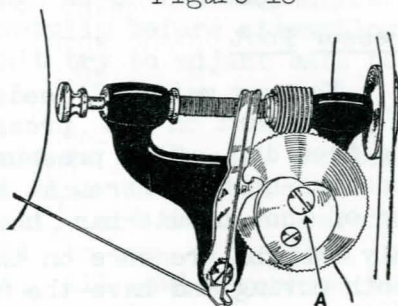


Figure 17

### Feed Dog

The feed dog, which pushes the material along, seldom needs replacing. If the feed dog is set correctly at its highest position the bottoms of the notches formed by the teeth are even with the top surface of the throat plate. If it is set too high, it will cause material to pucker along a line of stitching. To adjust, loosen the screw A, that holds the feed dog in place, move the dog to the correct position and tighten

the screw. Whether this screw is on the left or right side of the feed works depends on the kind of machine (Figure 18 and 19).

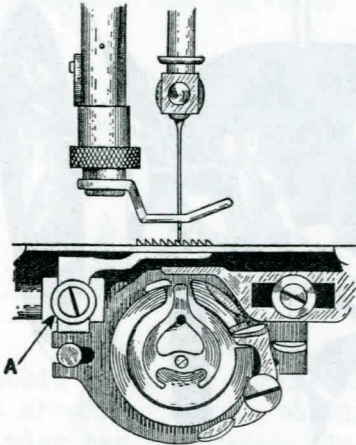


Figure 18

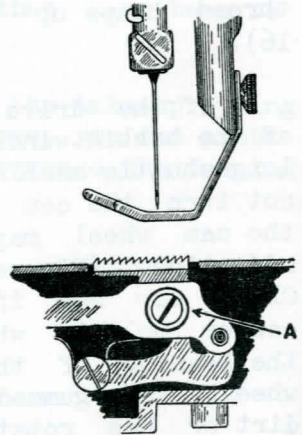


Figure 19

### Presser Foot

The way material feeds through the machine depends in great part on the pressure of the presser foot on the feed dog. This pressure is adjusted by turning the pressure-control screw at the top of the presser bar on top of the needle-bar housing (Figure 1, p. 4). Use only enough pressure on the presser foot to keep the cloth moving and have the machine make a straight seam. If the pressure is too light, the cloth may slip from side to side, causing staggered stitches and a crooked seam. Too much pressure makes the machine run hard and may leave marks of the feed dog on the material. Less pressure usually is required for thick or bulky material than for thin material. If the above adjustment is correctly made, the pressure is light enough so that sewing over a pin will not blunt or break the needle.

### Shuttle and Shuttle Cradle

Check the adjustment of the shuttle cradle on a long-shuttle machine to see if thread passes freely between shuttle and cradle. If the thread does not pass freely correct the condition by loosening the screw



that holds the cradle, moving the cradle slightly away from the race, and then tightening the screw again firmly.

### Treadle and Belt

If the treadle is loose and noisy, tighten the bearing at whichever end of the treadle is most convenient to reach. Place a screw driver in the slot of the adjusting bolt, hold it firmly as you loosen the lock nut with the wrench (Figures 20 and 21). With the screw driver, tighten the bolt until it is just tight; then loosen it slightly. Tighten the lock nut. Run the machine. CAUTION: A bearing that is too tight makes the machine run hard. If the treadle still runs noisily, some other bearing may need adjusting. Many drive-wheel bearings may be adjusted as described above. Connecting-rod bearings adjust in many different ways. Study the machine carefully before attempting to adjust these bearings. Don't try to adjust ball bearings.

If the leather drive belt is too loose, shorten it as follows: Open the hook that holds the belt ends together, pull the belt tight, and measure carefully how much of the belt should be cut off; then cut. Punch a new hole in the belt. All sewing-machine belts have a flat, smooth side. Lay the belt on a hard surface and punch the hole with the stiletto or ice pick, down through this flat side straight through to the other side of the belt. This makes a hole that will not pull out. Be careful not to tear the leather at the hole. Hook the two ends together and flatten the hook with the pliers.

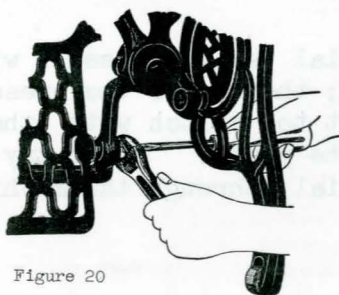


Figure 20

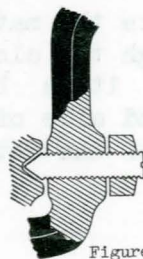


Figure 21

## RUNNING THE MACHINE

Always be sure before you start to use a machine that it is wiped clean. Select the thread, either cotton or silk, of a size to suit the material you are sewing on.

Use a needle of the right size for the thread. A needle that is too coarse will poke holes in the cloth too large for the thread to fill, or will cause skipped stitches.

Use the same size thread on the bobbin as on the top of the machine, except when you want special stitching effects.

If the machine has no automatic bobbin winder release, be careful not to wind the bobbin too full or too tight or the thread may break in stitching.

Set the stitch length; then, if necessary, adjust the upper tension to suit the thread and material. For ordinary sewing on a lock-stitch machine, 12 to 16 stitches to an inch is about right. Use a longer stitch for heavy material; a shorter one for fine. If stitch length isn't specified on the stitch control, count the stitches in a measured inch of sewing.

Pull enough thread through the needle to keep the needle threaded when the take-up lever rises to its highest point. Pull the under thread up from the bobbin and draw both threads back under the presser foot and hold them loosely until you start to stitch (Figure 22). This prevents bunching of threads during the first few stitches.

Place the material so the needle will be sure to go through the cloth; then lower the presser foot. In general, it is best to stitch with the seam at the right-hand side of the goods. Never try to hasten the feeding of the material through the machine by pushing

or pulling while stitching. This will produce imperfect stitches and cause the needle to bend or break. When the end of a line of stitching is reached, stop the machine before the stitching runs off the material. Bring the take-up lever to its highest point, raise the presser foot, cut the thread, and remove the material. Then there will be enough thread to start the machine again.

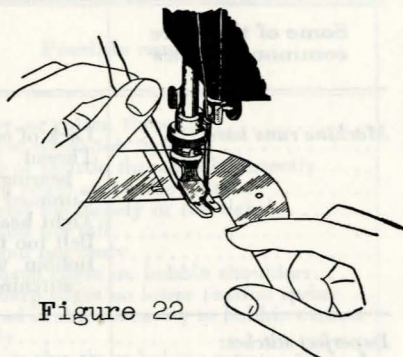


Figure 22

A machine kept clean, oiled and correctly adjusted should produce perfect stitching. If there is any difficulty in securing good results, consult the summary of machine troubles and their possible causes (pp. 24 and 25), and make the adjustments indicated.



MACHINE TROUBLES

Some of the more common troubles	Possible causes
<i>Machine runs hard</i> . . . . .	Lack of oil . . . . . Thread wound around wheel and treadle bearings . . . . . Gummed oil or dirt in bearings . . . . . Tight bearings . . . . . Belt too tight . . . . . Bobbin winder against wheel or belt during stitching . . . . .
<i>Imperfect stitches:</i> Looped stitches on top of cloth or upper thread lies straight along top of cloth.	Upper tension too tight or lower too loose . . . . . Bobbin incorrectly threaded . . . . . Dirt, lint, or rust between upper tension disks . . . . . Dirt, lint, or pieces of thread under lower tension spring . . . . .
Looped stitches on lower side of cloth or lower thread lies straight along bottom of cloth.	Incorrect threading . . . . . Upper tension too loose or lower too tight . . . . . Dirt, lint, or rust between upper tension disks . . . . . Dirt, lint, or pieces of thread under lower tension spring . . . . . Dirt, or lint in end of shuttle or bottom of bobbin case . . . . . Shuttle too tight in shuttle carrier . . . . .
Skipped stitches . . . . .	Needle bent . . . . . Needle too small for thread . . . . . Needle set too high or too low . . . . . Needle set wrong side out . . . . . Needle incorrectly threaded . . . . . Needle too long or too short . . . . . Oil on needle or too much on shuttle race . . . . . Shuttle point blunt or worn . . . . .
Staggered stitches . . . . .	Too little pressure on presser foot . . . . . Take-up spring weak, broken, or missing . . . . . Incorrect adjustment of take-up spring . . . . .
Stitches of uneven length	Improper pressure on presser foot . . . . . Feed dog not adjusted properly . . . . . Dirt around feed works . . . . .
<i>Upper thread breaking</i> . . . . .	Poor, knotty, or rotten thread . . . . . Machine threaded incorrectly . . . . . Needle set wrong side out . . . . . Needle set too high or too low . . . . . Needle bent . . . . . Needle too fine for thread . . . . . Needle threaded incorrectly . . . . . Needle rubs against presser foot, needle plate, or shuttle . . . . . Rough or sharp places on shuttle or eye of needle . . . . . Upper tension much too tight . . . . . In long-shuttle machine—not enough clearance between shuttle and shuttle cradle . . . . .

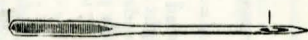
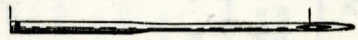

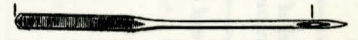
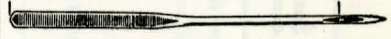

MACHINE TROUBLES—Continued

Some of the more common troubles	Possible causes
<i>Lower thread breaking . . . . .</i>	Poor, knotty, or rotten thread . . . . . Lower tension much too tight . . . . . Bobbin case or shuttle threaded incorrectly . . . . . Bur or sharp edges on needle plate . . . . . Bobbin wound too loosely or too tightly . . . . . Bobbin wound too full . . . . . Bobbin wound unevenly . . . . . Rough or sharp edges on bobbin shoulders . . . . . Rough or sharp edges on lower tension spring . . . . . Dirt or thread in shuttle cavity so bobbin cannot turn freely . . . . . Packed lint in shuttle or bobbin case . . . . .
<i>Material not feeding through machine correctly.</i>	Stitch-length regulator turned too far so feed is not acting . . . . . Dirt under needle plate around feed dog . . . . . Incorrect setting of feed dog . . . . . Incorrect pressure on presser foot . . . . . Bent presser foot or feed dog . . . . .
<i>Bobbin won't wind correctly.</i>	Drive wheel on winder not bearing heavily enough on handwheel or belt . . . . . Rubber tire on bobbin-winder wheel loose, oily, or worn . . . . . Thread guide on winder bent so thread piles up at one end of bobbin . . . . . Cam wheel that operates thread guide not turning freely . . . . . Cam wheel that operates thread guide incorrectly set . . . . .
<i>Clutch not releasing hand-wheel.</i>	Handwheel bearing gummed . . . . . Clutch bound with thread or gummed with dirt, thread, or oil . . . . . Incorrect assembling . . . . .
<i>Handwheel hard to turn or set.</i>	Thread jammed in shuttle race . . . . . Thread or dirt in bearings . . . . . Bearings rusted or gummed . . . . . Bearings too tight . . . . .
<i>Runs noisily . . . . .</i>	Lack of oil . . . . . Loose bearings . . . . . Shuttle loose in its carrier . . . . . Loose bobbin case . . . . .
<i>Puckers in cloth: Seam puckers . . . . . Side puckers . . . . .</i>	One or both tensions too tight . . . . . Dull needle . . . . .
<i>Needle breaking . . . . .</i>	Pulling the material while stitching . . . . . Needle too long or set too low . . . . . Presser foot incorrectly attached . . . . . Failure to raise needle before removing material . . . . .



## INTERCHANGEABLE NEEDLE LIST

Suitable needles for given machines, indicated by various code designations

Names of sewing machines	Brewer Sewing Supplies Co.	Boye Needle Co.	Bryson's Universal Code	Crowley	National Sewing Machine Co.	Singer	The Torrington Co. (key letter)	Needles (actual size)
Domestic.....	J	16	Y	62	D	15X1	Y	
Free.....	J	16	Y	62	D	15X1	Y	
New Home, Rotary.....	J	16	Y	62	D	15X1	Y	
New Royal A.....	J	16	Y	62	D	15X1	Y	
Singer, 15, 27, 66, 101, 115, 127, and 201.....	J	16	Y	62	D	15X1	Y	
Eldredge, 2 Spool.....	R	16	Y	62	D	15X1	CC	
Franklin.....	R	16	Y	62	D	15X1	CC	
Kenmore.....	R	16	Y	62	D	15X1	CC	
White, Rotary.....	R	16	Y	62	D	15X1	LL	
Damascus.....	M	6	Y	62	D	15X1	BB	
Minnesota H.....	M	6	Y	62	D	15X1	BB	
Standard, Rotary.....	M	6	Y	62	D	15X1	BB	
Brunswick.....	E	14	Z	56	C	20X1	J	
Damascus.....	E	14	Z	56	C	20X1	J	
Eldredge, Rotary.....	E	14	Z	56	C	20X1	J	
National, Rotary.....	E	14	Z	56	C	20X1	J	
Western Electric.....	E	14	Z	56	C	20X1	J	
Westinghouse.....	E	14	Z	56	C	20X1	J	
New Home, Vibrator.....	G	4	Z	60	C	20X1	R	
Minnesota I.....	G	4	Z	60	C	20X1	R	
Singer, V. S. 1.....	K	4	Z	60	C	20X1	X	
New Royal.....	I	24	Z	74	C	20X1	T	
Franklin, Vibrator.....	P	12	Z	66	C	20X1	KK	
White, Vibrator.....	P	12	Z	66	C	20X1	KK	
New Domestic.....	D	8	1&	52	A	1X4	H	
Household.....	H	2	&2	58	F	1X7	M	
Wheeler & Wilson 9.....	O	18	X2	68	E	9N1	HH	
Davis, New Style—Long.....	C	10	1X	54	B	1X2	F	
White, Old Style.....	T	20	&4	70	.....	1X1	N	
Wilson, Oscillating <sup>1</sup> .....	T	20	&4	70	.....	1X1	OO	

Material from the Bryson's Interchangeable Needle List. Used by permission of the White Sewing Machine Company.

<sup>1</sup>Needle for Wilson Oscillating machine is longer than needle shown.