HANDLING

SOLUTIONS TO SIMPLE SEWING PROBLEMS

(Thread Breakage)

When we are investigating any sewing problem, we should be certain that a good quality thread, in good condition, is used.

To eliminate the causes of thread breakage, make certain that there is a free pulling-off of thread from thread cone or spool, correcting any tendency for thread to hang back because of rough surfaces over which it passes. Eliminate knots, kinking, or double turns around guide wires. Threading of machine should be observed and corrected, where necessary. See that all thread guides, tension devices, and take-ups are used correctly. Make certain that needle is set correctly in needle bar, that needle itself is not bent, that grooves and eye of needle are free of nicks or sharp edges, that needle point is smooth and that needle is correctly threaded. Pull needle thread through eye of needle. If it pulls through smoothly, it may be presumed that the cause of thread breakage is elsewhere.

After establishing that needle and thread conditions are correct, check throat plate (particularly the underside) for rough edges around needle hole. Bobbin case and hook (or shuttle) should be examined for sharp points or burrs, which may be caused by needle breakage, or by setting needle too close to hook (or shuttle) or by careless handling by the operator. A badly worn hook should be carefully examined for rough or sharp edges around raceway.

Check the edges and corners of bobbin case position slot and position finger. There should be no nicks or burrs. Position finger should not be set too close.

All surfaces over which the needle thread passes should be free of roughness, sharp edges, and burrs.

Test the pressure exerted by tension discs on thread. It should always be greater than the force exerted by the take-up spring, since function of the take-up is to aid in setting the stitch rather than to draw needle thread through tension device.

Check timing of hook and of feed motion. Timing has an important bearing on thread breakage. Check as well, the height setting of feed dog. Remember that the needle should always pass as close as possible to the point of hook or shuttle. Failing this may cause thread breakage, skip-stitches and poor stitch formation.

Accumulations of packed lint and fluff around hook, under throat plate and between feed dog teeth should be thoroughly cleaned out.

Where silk, nylon or hard finished threads are in use, it may sometimes be discovered that grooves are being cut by the thread in surface of thread guides, take-up springs, take-ups, and in hook. Check these areas carefully and correct immediately.

HANDLING

SOLUTIONS TO SIMPLE SEWING PROBLEMS

(Thread Breakage - continued)

When bobbin thread breakage occurs, look for incorrect threading of bobbin case. Then check for sharp edges on bobbin case tension spring and on other surfaces over which bobbin thread passes. Under-surface of throat plate and edges of feed dog should be examined for roughness and burrs. Bobbin should revolve freely without excess friction against the spindle on which it is supported, and should be properly wound so that it will unreel smoothly. Bobbin thread tension may be too tight. Adjust, when necessary.

(Skipping of Stitches)

Skipping of stitches is almost always a result of some interference with the correct formation of needle loop, or the failure of hook or shuttle point to enter needle thread loop at correct time and place. Usual causes: too small a needle, a bent or blunt needle, a needle incorrectly set.

Interference with the formation of needle thread loop can be caused by a lack of firm control of the material. If the material is not held by the presser foot at point where needle passes through, material may flag (move up and down with needle), preventing the correct loop formation. Incorrect setting of presser foot lifter mechanism may prevent presser foot from resting firmly on material. Presser bar may be set too high. If space between toes of foot is too great, or if opening where needle passes through foot is too large, flagging of material will be increased. Too large a needle hole in the throat plate and unsuitable types of feed dog and throat plate will contribute to skipping. Certain types of thread tend to twist or kink and form poor needle thread loops. Materials which adhere to needle may also interfere with loop formation and cause stitches to be skipped.

(Looping and Loose Stitching)

Any interference with the free passage of needle thread around the bobbin case or with the correct setting of stitch, may leave a part of the needle thread loop lying loose on underside of material.

When this problem exists, look for rough spots or nicks on surfaces over which the thread passes, dirt and lint packed in hook or shuttle, or a loose bobbin case latch. These conditions may just retard passage of thread long enough to cause excess thread to be drawn through tension device by take-up.

Another cause may be friction between some types of thread and material. Thread lubricant is one means of relieving this condition.

Highly resistant or adhesive materials can retard needle thread loops. The solution to this problem may be in the use of reduced needle blade needles, double grooved needles, or needles with a different type point.

When loose stitching occurs on extremely long stitches it may be necessary to lengthen the groove in presser foot in back of needle.

(Poor Feeding)

When material is not being fed correctly, investigate settings of presser

HANDLING

(Poor Feeding) - continued

foot and feed dog. Check timing of feed.

Irregular length of stitches, puckering or gathering of the material may indicate that foot is not holding material down securely.

When feed dog does not drop completely below throat plate on its return stroke, it tends to draw the material back with it. This may cause distortion of the material. If feed dog is set too high it may cut the material. Feed should be carefully leveled with sole (under-surface) of presser foot.

When feed time is too fast it may distort the material, by causing it to feed forward before needle has risen above it.

Presser foot should offer as little resistance to material, as possible. Check bottom surface of foot for wear or abrasion, particularly at angle that toe makes with sole of presser foot.

(Poor Stitch Formation)

When bobbin thread is pulled to top of material and needle thread lies flatly on top, instead of threads interlocking at half-way point in material thickness, it is usually the result of too tight needle thread tension or too loose bobbin thread tension. It could also be caused by feed dog not rising to its correct height. (Set feed dog slightly higher.)

When needle thread is pulled to bottom surface of material and bobbin thread lies flatly on bottom, needle thread tension may be too loose, bobbin thread tension too tight or feed may be set slightly too high.

Any of these conditions, can cause a shortened puckered stitch.

(Breaking of Needles)

When needles break, check for possibility of needle striking other parts. Needle may become bent. Presser foot, throat plate, feed dog, hook (or shuttle) may be incorrectly set. See that needle, presser foot and attachments are securely fastened. When sewing thick fabrics or over heavy seams, use a heavier needle.

(Machine will not Start)

When machine will not start, check the electric outlet. Make certain power is turned ON. Examine wiring carefully for broken electrical connections.

Motor may not be suited to electric supply. Voltage, frequency, current (AC or DC) of power supplied, should be within range of that described on motor nameplate.

Examine motor for the following -

1. Dirty commutator. It should be smooth and free of carbon and grease. Carbon deposit can be removed from commutator with an ordinary rubber eraser.

HANDLING

(Machine will not start)(continued)

2. Carbon brushes not making contact. Brushes may be worn, needing replacement, or they may be sticking in brush tubes. Reset.
3. Armature binding, due to wear of shaft or bushings. Motor end covers may be incorrectly seated.
4. Other causes of binding, such as lack of lubrication. Grease cups may be dry.
5. Armature contacting field oils. Replace worn parts.

(Machine is Sluggish)

If machine will start,but runs slowly or weakly, look for the following conditions -

1. Lubricant in machine may have become gummy or hard. Raise or remove presser foot and run machine for a few minutes. If this does not help, machine may have to be cleaned and re-lubricated.
2. Too much pressure on presser foot. Reduce.
3. Seams too heavy for specific machine design.
4. Motor not suited for power supply (voltage supply lower than required for motor).
5. Mechanical binding within machine. Turn pulley by hand, free of motor. Disconnect arm shaft from bed shaft, to isolate area of binding. Examine all working parts and correct maladjustment or damage wherever it is found.

(Machine is Noisy)

A sewing machine is usually designed to run quietly and with as little vibration as possible. When a machine is noisy, check for the following -

1. Excessive end play in take-up assembly, in hook or feed shafts, in arm shaft or between mated gears. Reset
2. Noisy bobbin case. Replace.
3. Throat plate incorrectly seated.
4. Feed dog set too high, striking throat plate.
5. Excessive thread clearances.
6. Loose covers.
7. Broken parts.

SEWING-OFF

Before machine can be turned out for general operation it must do the job it is designed to do. It must do it right and without loss of time to operator.

Now that the machine has been freed of all minor maladjustments, it is time to discuss the finer points of servicing it to handle specific sewing problems. Each assembly and device in the sewing mechanism should now be fairly well known to the reader.

The following instructions will therefore deal with final sewing-off procedures and specific problems of individual designs.

HANDLING

MATCHING NEEDLE, THROAT PLATE, FEED DOG AND PRESSER FOOT

For efficiency in sewing, use smallest needle possible for thread and material in use. The throat plate should have a needle hole just large enough to accommodate needle and thread movement. Feed dog slots in throat plate should be as close as possible to needle hole (without interfering with needle) and slots should only be large enough to accommodate full range, free movement of feed dog.

This design will permit feed dog to be positioned to grip the material on line of stitching as close as possible to the last stitch formed. Tension of feed will then be applied, for the greater part, to the last stitch rather than to the last several stitches. Area covered by feed dog teeth should only be as large as necessary for operation to be performed.

Presser foot should match feed dog teeth in pressure area covered. Foot should always be aligned with feed dog and needle, and only apply pressure sufficient to assist feed movement and stitch formation.

When chaining-off is intended, needle should enter needle hole in throat plate slightly forward of center.

SETTING THE NEEDLE

Raise needle bar to highest point.

Insert needle up into needle bar (or needle clamp) as far as it will go, with short groove side (scarf) facing hook or shuttle point. Securely fasten needle set screw.

Thread the needle. Hold loose end of needle thread lightly and turn machine pulley slowly, by hand, until needle descends to its lowest position and rises above hook or shuttle. If needle bar and needle are correctly set and machine is correctly timed, loop of needle thread will have been taken by hook or shuttle point ready to form the first stitch.

Continue to move needle upward, above throat plate, still holding end of needle thread. Needle thread loop will draw end of bobbin thread up out of needle hole in throat plate, ready to start sewing.

THREADING

Use left twist thread in needle. Bring take-up lever to its highest position.

Thread the upper and lower threads through their various thread handling devices exactly as described in instructions supplied by manufacturer. Needle is always threaded from long groove to short groove side.

Threads should flow smoothly through all eyelets, discs and other contacts.

Needle thread should not touch rough surfaces of arm casting.

To increase thread control, bobbin thread should unwind from bobbin in the opposite direction from its passage under bobbin thread tension spring.

HANDLING

PRE-TENSION CONTROL

On machines that have a rotary tension device, a pre-tension control is used to ensure that needle thread grips the rotary tension wheel, for full tension control.

Insufficient pre-tension may cause looping or thread breakage on heavy work.

Excessive pre-tension can make it difficult to obtain light needle thread tension on light work.

THREAD TENSION CONTROLS

Tensions on both upper and lower threads is increased by tightening regulating nut (or screw for bobbin thread tension) and decreased by turning regulating nut (or screw) outward.

On machines with horizontal hook or shuttle on vertical axis, turn hook or shuttle to position where regulating screw on bobbin case is accessible.

Tension on both threads should be as light as possible, while still sufficient to set stitch correctly in material.

A seam stitched with balanced tensions is invariably stronger than a seam stitched with unbalanced tensions. A simple test for tension balance can be made by stitching diagonally across a folded square of fabric, removing sample from machine and (while holding line of stitching firmly at each end with a thumb and fore-finger) pulling evenly and gradually until thread breaks. The broken thread is always the one with the heavier tension. If both threads break simultaneously, the stitch is balanced.

Ordinarily, to avoid the accumulation of excess needle thread tension, the bobbin thread tension is regulated first and needle thread tension is increased or decreased from then on to suit the sewing operation.

For average conditions, set the bobbin thread tension so that when the fully wound bobbin in its bobbin case is allowed to hang from its own thread end, it will slowly descend unwinding from its own weight. Exact specifications for tension can be obtained from the manufacturer and measured with a tensiometer.

Regulate needle thread tension only when presser foot is down. Tension should be set so that interlocking of thread occurs in center of material being sewn.

When a tension assembly, that includes a numbered (or a + and -) indicator dial, has been removed, disassembled and replaced, pre-set the tension as follows -

Lower the presser bar and set tension at "0". Place a length of thread between the tension discs and draw it through the discs. At this point there should be a barely perceptible pull on the thread to indicate a very slight tension on the thread. If the pull is too strong at "0" setting, press in numbered dial to dis-

HANDLING

THREAD TENSION CONTROLS (cont'd.)

engage the pin in the thumb nut from the dial and reset the pin in one of the holes to the left of the previous setting for less tension at "0". If there is no tension at all at "0" setting, press in dial and reset pin of thumb nut in one hole to the right of the previous setting.

It should be noted that the numerals on tension dial merely indicate arbitrary graduations in tension. They do not denote size of thread or ounces of tension.

SETTING TAKE-UP (CHECK) SPRING STROKE

Thread the machine in the usual way. Turn the machine pulley over toward you and, at the same time, observe the action of the take-up spring. As the take-up lever begins to rise, the take-up spring should make a slight dip and return to its highest position. Then, as the take-up lever approaches the top of its stroke, setting the stitch, the take-up spring should be drawn all the way down, setting the stitch. As the take-up lever descends, the take-up spring should return to rest.

NOTE: Under certain conditions of tacking, it may be necessary to set the check spring higher than it is otherwise normally set.

To increase or decrease the height of the take-up spring (which will respectively increase or decrease its movement), loosen tension stud set screw and turn stud, together with entire take-up spring assembly, setting take-up spring height as required. Then, securely tighten tension stud set scre

(451 TYPE)

Setting this assembly is the same as outlined above, except take-up spring action is to be rela ted to needle and to rotary take-up movement instead of to movement of to take-up lever. Spring should come to rest, just as point of needle on its downward stroke reaches top surface of throat plate.

(400W TYPE)

Similar to 451 TYPE except setting includes positioning thread pull-off. Horizontal portion of pull-off should normally be 1/8 to 1/4 inch below bottom of its holder (depending on variety of machine).

SETTING TAKE-UP (CHECK) SPRING TENSION

Tension on take-up spring should be sufficient to insure action at top speeds, yet light enough to allow the take-up spring to be drawn all the way down, before any thread is drawn through the tension discs, as take-up lever approaches top of its stroke.

NOTE: Tension on check spring may require different settings depending upon size of thread used. Heavier thread and bulkier material require more tension to control the stitch setting.

HANDLING

SETTING TAKE-UP (CHECK) SPRING TENSION (cont'd.)

Should adjustment be required, make certain that the tension stud set screw is securely tightened. Then, (with thumb nut on stud to prevent breakage of split end) use a suitable screwdriver in the slot of the tension stud, turning stud toward left to decrease tension, or toward right to increase it.

The check spring setting should be reviewed each time presser bar height is readjusted or a different presser foot is applied to the machine.

(451 TYPE)

To obtain the same results, set this type as follows -

Check spring should overthrow beyond the "5 o'clock" position but not beyond the "6 o'clock" position when machine is sewing 16 stitches to the inch at 5000 R.P.M.

To adjust, loosen regulator set screw in machine head and remove assembly from machine. Then loosen stud set screw in regulator and, while holding regulator (with thumb nut toward you), turn stud over to left to increase tension or over to right to decrease it. Tighten stud set screw, return assembly to machine. Tighten regulator set screw and recheck the settings.

SETTING NEEDLE THREAD TENSION-RELEASER

The tension-releaser should automatically cause the spring pressure on the needle thread tension discs to be released whenever presser bar is raised. It should be set so that it will not release during the sewing operation when the presser foot is resting upon the material. Review setting of releaser, when planning to sew heavier than normal material, to prevent stitching with a released tension.

Usually the releaser may be easily reset after loosening its adjusting screw. If releasing mechanism cannot be adjusted correctly, check the releasing pin in thread tension assembly. It may be jammed or broken, or it may not be contacting the releaser for some other reason.

CLEARING THE ROTARY TAKE-UP OF LOOSE THREAD-ENDS

(400W TYPE)

When needle thread breaks, during sewing, loops of thread from auxiliary take-up disc may accumulate on thread-sewing finger. Operator should stop the machine, grasp these loops, cut them on thread-sewing finger and remove them from machine.

At low speeds loops of thread often remain upon tapered pin on auxiliary disc. To remove them, open the take-up guard. Remove loops from pin and sever them. Machine will now clear itself when restarted.

HANDLING

CLEARING THE ROTARY TAKE-UP OF LOOSE THREAD-ENDS

(451 TYPE)

If needle thread breaks at normal operating speed, an extra piece of thread may be trapped in take-up. Open take-up grille and remove loose thread. Close grille, rethread machine and resume sewing.

Care should be taken to avoid injury from thread cutter.

REGULATING PRESSURE ON MATERIAL

The exact amount of pressure applied by the presser foot to the material influences the ease with which you achieve a straight seam and a uniform series of stitches. This pressure should be heavy enough to feed the work smoothly, without side or lineal creepage of plies of material and light enough to avoid marking or marring the fabric.

Surface finish of material being sewn, as well as its weight, thickness and texture should be considered in determining amount of pressure needed.

Lighten the pressure when sewing light weight fabrics, fine silks or flimsy or soft materials. Crisp fabrics require more pressure.

Increase the pressure for heavy-napped fabrics. Stitching should be in line with direction of the nap. Spongy or pile fabrics (such as velvet), however, require a lighter pressure than their appearance of thickness may indicate, to prevent crushing. Stitching should be in line of direction of the pile.

To increase pressure, turn regulating screw downward, tightening it against pressure spring.

To decrease pressure turn regulating screw upward, away from pressure spring.

To avoid irregular feeding, do not raise presser bar during sewing. Avoid the habit of unconsciously resting the knee or foot against lifter mechanism.

To adjust pressure, after installation of presser bar and associated parts, turn thumb screw upward until almost no pressure is applied by presser foot. (Machine should not be threaded during this adjustment).

Run the machine and, at the same time, very gradually increase the pressure. At first, presser foot will vibrate very rapidly; gradually decreasing its vibration as pressure is increased.

When presser foot stops vibrating, STOP increasing pressure. Finer adjustment of pressure can now be made in accordance with instructions above, considering feeding quality, stitching and fabric appearance desired.

HANDLING

REGULATING PRESSURE ON MATERIAL -(continued)

(281 TYPE - LOCK NUT)

To maintain adjustment, after correct pressure is obtained, tighten lock nut on pressure regulating thumb screw.

(451 TYPE - FLAT SPRING AND BALL)

Pressure is increased by tightening slotted-head screw on top of arm against flat spring inside of arm.

Flat end of pressure spring rests upon a 7/32 inch ball on top of presser bar. DO NOT completely release pressure on this spring as this may allow ball to become displaced.

REGULATING STITCH LENGTH

(Lever and Indicator TYPE)

The distance that the feed moves the material for each stitch (stitch length) is indicated by the position of the stitch regulating lever in the slot of the indicator plate. On some machines, this lever is also used to throw feeding movement into reverse.

Numerals on the indicator plate represent approximate number of stitches per inch. The greater the number indicated, the shorter the stitch.

To establish the stitch length desired, loosen holding screw or nut and move regulating lever toward greater number of stitches per inch for shorter stitch, toward lesser number of stitches per inch for longer stitch, or to median line for no feed at all. Moving lever beyond this median line will cause machine to feed in reverse.

On reverse feed and back tacking types, machine will now make indicated number of stitches per inch in either forward or reverse direction, depending whether lever is at its lowest or highest position in slot of indicator plate.

Use longest stitch (lowest number of stitches per inch) for basting. Some machines have an indented area at this stitch length, where lever can be locked in place, for extended periods of sewing.

(281 TYPE - BUTTON)

Approximate stitch lengths are indicated on hub of machine pulley.

To regulate stitch length, depress button on top of machine arm. Turn machine pulley toward you slowly, until button drops into notch in feed eccentric (inside arm). Turn pulley until desired stitch length is opposite indicator mark on arm and release button.

Never depress button while machine is running. Make certain button is disengaged (from feed eccentric) before starting machine.

HANDLING

REGULATING STITCH LENGTH (Cont'd.)

(451 TYPE)

Similar to 281 TYPE, except button is in machine bed, instead of at top of arm.

PREVENTING UNAUTHORIZED CHANGES IN STITCH LENGTH

(281 TYPE)

Remove arm top cover. Remove retaining ring near tip of stitch regulating button, allowing button to be withdrawn. Insert plug screw (listed for machine) in cover and replace cover on machine.

(451 TYPE)

Tighten two inside socket screws in feed eccentric gib, after desired stitch length is obtained. Then, tighten two outside socket screws in gib.

FEED ECCENTRIC STOP SCREWS (281 TYPE)

Machine can be prevented from making longer stitches than a predetermined maximum by inserting a stop screw in feed eccentric. These stop screws are listed in parts list for machine. (See also instructions for "FEED DOG TIMING (281 TYPE)" on page 152 .

ADJUSTING FEED DRIVING AND REVERSING MECHANISM (451 TYPE)

Position in which crank is secured to feed reversing shaft (beneath machine bed) determines actual travel of feed dog with respect to setting of feed driving eccentric.

To position this crank, set feed driving eccentric at 6 stitches per inch. Place clean paper beneath presser foot. Lower foot. DO NOT TOUCH FEED REVERSE LEVER. Loosen pinch screw, that holds crank, and rotate crank on its shaft until exactly 6 needle punctures per inch can be obtained in the paper. Tighten pinch screw. Test. Reset when necessary. Machine is now correctly set for 6 stitches per inch, forward, and will produce slightly less in reverse.

TIMING RELATIONSHIPS

(Needle Bar, Take-up, Needle and Oscillating Hook or Shuttle)

Timing relationships of needle bar and take-up motions are usually established by the fact that both motions are derived from a needle bar crank, which is positively fixed, in position, on the arm shaft. This fixed position is determined in relation to arm shaft crank which transmits motion to oscillating hook (or shuttle) driving shaft.

Correct setting of needle in relation to loop-taker is dependent upon the correct height and orientation of needle. Needle must be straight. It also must be of correct length and design. It must be set firmly in needle bar clamp on needle bar. It should be oriented so that direction of eye through needle

HANDLING

TIMING RELATIONSHIPS

(Needle Bar, Take-up, Needle and Oscillating Hook or Shuttle) - (cont'd.)

is parallel with loop-taker shaft. Long groove of needle must be on opposite side from point of loop-taker. When needle, on its upward stroke, after passing lowest point of stroke, has risen 1/10th of an inch, point of loop-taker should be just opposite centerline of needle and 1/16th of an inch above top of needle eye.

See Timing and Settings, in "ASSEMBLY" section, on pages 149 and 150 .

(Needle Bar, Take-up, Needle and Rotating Hook or Shuttle)

Needle bar and take-up motion relationships on rotating hook or shuttle machines are also established by the fact that both motions are derived from a needle bar crank, fixed in position on arm shaft. On machines with a rotating loop-taker, however, this fixed position is determined in its relation to "flats" (or position spots) provided for feed motion eccentrics. On some machines, these eccentrics are mounted on arm shaft. On other machines, they are mounted on bed shaft. Length of stitch is varied by a stitch regulator which affects forward movement of the feed, usually by means of adjustable leverage or adjustable eccentrics.

Correct setting of needle in relation to rotating loop-taker is similar to setting described for oscillating loop-taker machines, except that the former are usually provided with timing marks on needle bar for determining the amount of needle bar rise required. With needle firmly set in needle bar, and needle bar at lowest point of its stroke, upper timing mark should appear at lower edge of needle bar bushing. At this point, needle thread should pass freely through eye of needle, without friction or pressure against bevelled surface of needle guard of bobbin case holder, and eye of needle should be above lower edge of this bevel. When needle bar rises on its upward stroke, to point when lower timing mark just reaches lower edge of needle bar bushing, point of loop-taker should be just opposite centerline of needle and 1/16th of an inch above top of needle eye. Point of loop-taker should be close to surface of needle scarf but not touching needle. Visible clearance at this point is the usual setting.

The 400W machine is an exception to the above, because needle bar timing marks are used differently. Lower mark on needle bar should appear at lower edge of needle bar bushing, at highest point of needle bar stroke. Higher timing mark (indicating correct amount of needle bar rise) should reach lower edge of lower needle bar bushing when point of hook is just opposite centerline of needle, after needle has passed lowest point of its stroke on its way up. (See Timing and Settings, in "ASSEMBLY" section, on pages 148 and 149 .

(Needle and Feed)

Timing of Feed in relation to stroke of needle, is controlled by setting a feed eccentric. This eccentric, usually on arm shaft, actuates both the forward and the lifting motion of the feed dog. Together, these two motions of one feed follow an elliptical path established in the design of the mechanism. Timing should be accomplished while feed is set for longest stroke. When point of

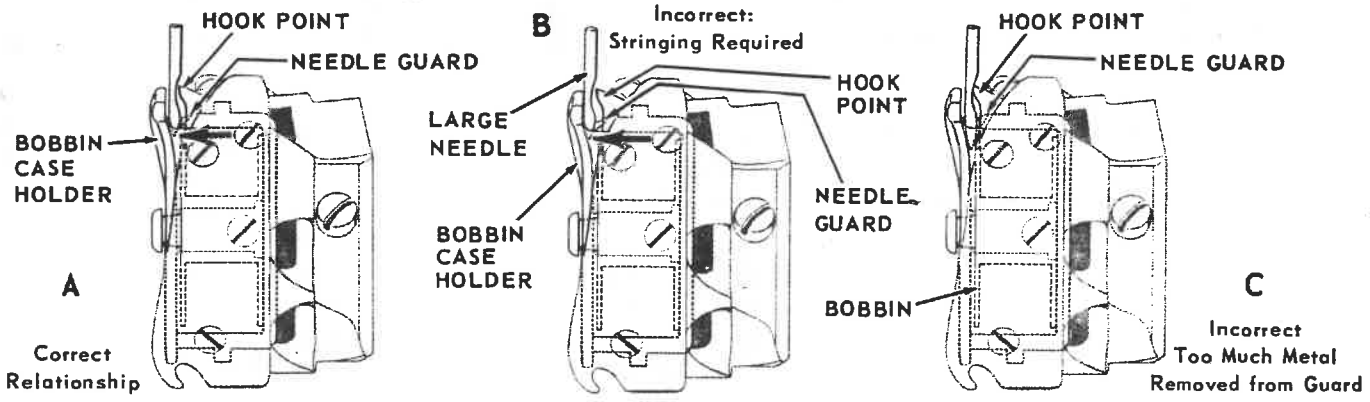
HANDLING

TIMING RELATIONSHIPS

(Needle and Feed) (cont'd.)

needle in its downward stroke just touches surface of material being stitched, feed dog should complete its forward motion and start to drop beneath the throat plate. (See also, Timing and Settings, in "ASSEMBLY" section, on pages 150 and 151 .)

STRINGING THE NEEDLE GUARD ON ROTATING HOOK MACHINES



Needle Guard at Loop-Taking Time

The needle guard on the bobbin case holder should prevent needle from contacting hook or bobbin case at any time. See illustration (A) above for correct relationship. When large needles (size 20 or larger) are used, needle guard may deflect needle too far toward left resulting in damage to needle. See illustration (B) above. To avoid this, it may be necessary to string the needle guard in accordance with the following instructions.

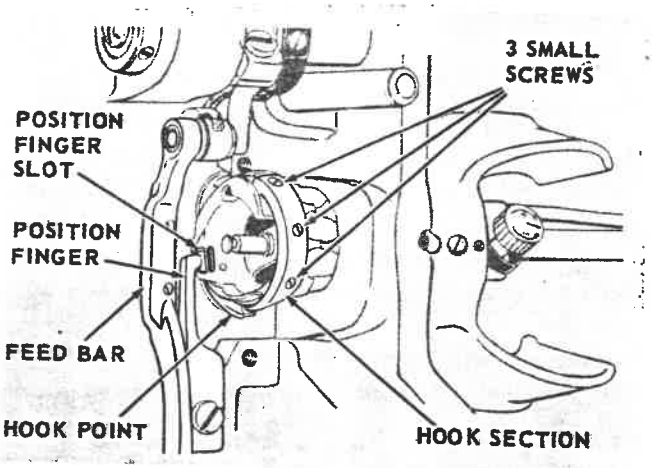
Remove needle, slide plate, throat plate and bobbin case from machine.

Turn machine pulley until feed bar is at its highest point.

Remove position finger.

Turn hook body to position shown at right and remove the hook section, by removing its three small screws.

Turn bobbin case holder until position finger slot on thread guard is at location shown at right. Slip bobbin case holder out of hook body.



Hook Section

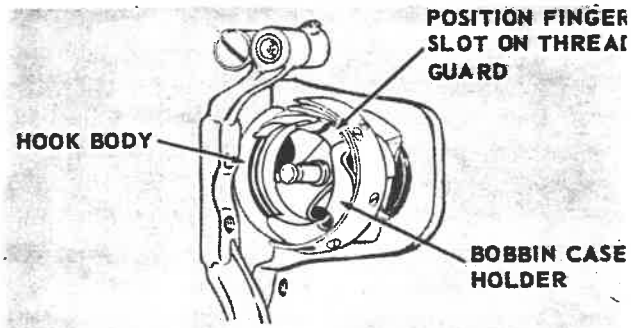


Fig. 32. Bobbin Case Holder

HANDLING

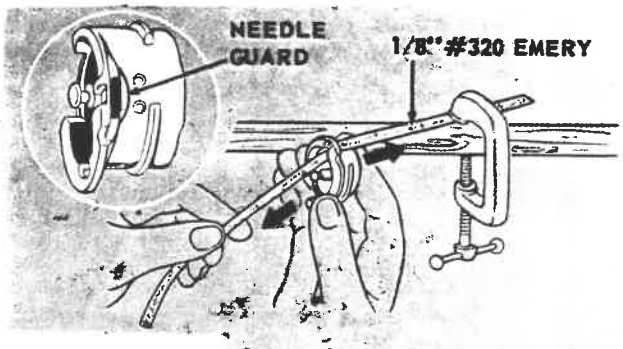
STRINGING THE NEEDLE GUARD ON ROTATING HOOK MACHINES (cont'd.)

Remove a slight amount of metal from needle guard by rubbing needle guard along a 1/8 inch strip of very fine emery cloth.

EXTREME CARE should be taken to avoid removal of too much metal as this may permit needle to strike hook. See illustration (C) above. Bobbin case holder will then need replacement.

Clean bobbin case holder thoroughly before replacing it in hook body.

Replace all parts in reverse order instructed for removal.



. Stringing Needle Guard