

CAUSES & SOLUTIONS OF INDUSTRIAL SEWING MACHINE PROBLEMS

Upper Thread (Needle Thread) Breaks

Cause	Solution
1. The tension of the upper thread is too tight.	1. Loosen the tension of the upper thread by turning the Tension Nut counter-clockwise.
2. The machine is not threaded correctly.	2. Check whether the upper thread runs correctly from the spool of thread to the Needle.
3. The upper thread is of poor quality. The thread may be too weak or it may be rotten due to improper storage and does not withstand the tension imposed on it. The thread may also be too hard and does not possess the necessary elasticity.	3. Loosen the tension of the upper thread by turning the Tension Nut counter-clockwise. If possible, replace the inferior thread with one of good quality.
4. The upper thread is of irregular thickness and has small knots which cannot pass through the eye of the Needle.	4. Replace the inferior thread with one of good quality.
5. The upper thread has wrapped itself around the spool pin on top of the machine.	5. Unwind the thread from the spool pin. Eventually place a felt washer underneath the spool of thread. If necessary, remove some of the thread from the full spool.
6. The upper thread is held back somewhere on its way from the spool of thread to the Needle.	6. Examine the string of thread from the Spool to the Needle and eliminate any interference with the free motion of the thread.
7. The upper thread curls around itself before entering the Tension Discs.	7. Place a felt washer underneath the spool of thread. If necessary, remove some of the thread from the full spool.
8. The eye of the needle is rough or sharp.	8. Insert a new Needle.
9. The Needle is not straight.	9. Insert a new Needle.
10. The Needle has a blunt or bent point.	10. Insert a new Needle.
11. The Needle is too fine for the upper thread and for the fabric being sewn.	11. Consult the "Needle and Thread" chapter and insert a Needle of correct size.
12. The upper thread is too coarse for the size of Needle that is being used.	12. Consult the "Needle and Thread" chapter and select an upper thread of the correct thickness.
13. The Needle is not inserted correctly in the machine. The needle grooves do not line up correctly.	13. Insert the Needle so that the short groove of the Needle faces the point of the Hook.
14. The Needle is threaded incorrectly.	14. Thread the Needle so that the upper thread passes through the needle eye from the long groove to the short groove of the Needle.
15. A wrong type of Needle is inserted.	15. Replace with the type of Needle recommended for the machine.
16. The Needle is not straight and rubs against the edge of the stitch hole in the feed dog.	16. Check whether the Needle is bent and replace it, if necessary, with a new straight Needle.
17. The operator pulls the fabric in the direction of sewing. The Feed Dog cuts the upper thread.	17. The fabric must not be pulled during sewing. The machine alone must feed the fabric.
18. The machine is started at full speed.	18. Start the machine at low speed and increase the speed gradually.
19. The machine is started with the Thread Take-up not in its highest position.	19. Start the machine with the Thread Take-up Lever in its highest position.
20. The Bobbin is bent and cannot revolve freely in the Bobbin Case. It is also possible that the Bobbin is wound too full or that the thread is wound unevenly around the Bobbin.	20. Replace the defective Bobbin with a new one. If wound too full, remove some of the thread from the Bobbin. If unevenly wound, replace the Bobbin with one which is wound correctly.

Upper Thread (Needle Thread) Breaks—continued

Cause	Solution
21. The lower end of the Needle Bar is bent. The Needle strikes the Presser Foot, the Throat Plate, the feed dog or the Hook.	21. Turn the Balance Wheel by hand. If the machine turns easily, bring the Needle Bar to its lower end and tap lightly with a hammer until the Needle goes through the center of the stitch hole in the feed dog.
22. The Throat Plate is not held firmly in place and shifts around. The Needle strikes the Throat Plate or feed dog.	22. Tighten firmly the screws which hold the Throat Plate or feed dog to the machine.
23. The Needle is too high in the machine. The point of the Hook cannot properly catch the loop of the upper thread and breaks this thread.	23. Adjust the position of the Needle Bar in relation to the Hook by raising or lowering the Needle Bar, as required.
24. The Needle is not pushed up entirely in the Needle Bar or in the Needle Clamp.	24. Push the Needle as far as it will go. Tighten firmly the screw which holds the Needle.
25. The Needle is too long for the type of sewing machine being used.	25. Replace with a Needle recommended for the type of machine being used.
26. The Needle is not held securely in the Needle Bar; it shifts slightly up and down.	26. Make certain that the Needle is pushed up entirely in the Needle Bar, then tighten firmly the screw which holds the Needle.
27. In horizontal axis Rotary Hook Machines, the Latch Lever of the Bobbin Case does not close entirely due to accumulation of lint and dirt underneath the Latch Lever. The upper thread, therefore, is prevented from sliding freely around the Bobbin Case and breaks.	27. With a pointed pin remove the lint and dirt underneath the Latch Lever of the Bobbin Case. Clean the entire Bobbin Case thoroughly with a small brush dipped in kerosene.
28. In horizontal axis Rotary Hook Machines, lint or dirt have accumulated in the circular groove on top of the center post of the Bobbin Case Holder. The center post is the part upon which the Bobbin Case is placed. Due to the lint or dirt in the groove of this center post the Bobbin Case Latch does not close entirely. As a result, the Latch Lever of the Bobbin Case also does not close entirely. It remains loose and prevents the upper thread from sliding freely around the Bobbin Case. The upper thread breaks.	28. With a pointed pin remove the lint or dirt from the circular groove of the center post. Clean Bobbin Case Holder thoroughly with a small brush dipped in kerosene.
29. The Feed Dog is timed too early. Excessive tension of the upper thread will be required to eliminate the small loops of thread which appear on the fabric. The excessive tension will finally cause the thread to break.	29. See whether loops of thread appear on the underside of the fabric. If increased tension of the upper thread does not eliminate these loops, adjust the "timing" of the Feed Dog.
30. The Thread Take-up Spring (Check Spring), is not adjusted correctly and does not take up the slack of the upper thread. The Needle pierces and tears the upper thread.	30. Adjust the Thread Take-up Spring. There must be no thread under the point of the Needle when the Needle is about to enter the fabric.
31. The Thread Take-up Spring is bent out of shape or broken.	31. Bend the deformed spring back to its proper shape, if possible. Replace a badly defective or broken spring with a new one.
32. The loop of the upper thread twists around itself below the Throat Plate, thus forming two small loops. The point of the Loop Taker (Hook) enters both loops, causing the upper thread to break.	32. This trouble may be caused by the following reasons: a. The grooves in the Needle are too shallow. Replace the defective Needle with one of good quality. b. The point of the Loop Taker is too close to the Needle. Adjust the clearance between the Needle and the point of the Loop Taker. The point of the Loop Taker should be set as close as possible to the Needle without touching it. c. The upper thread is not of the required quality. Use a different quality of thread.

Upper Thread (Needle Thread) Breaks—continued

- | Cause | Solution |
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| 33. The Loop Taker (Hook) has burrs, rough spots or rough and sharp edges which cut the upper thread. The point of the Loop Taker may be worn blunt or be damaged. | 33. Smoothen the defective portions of the Loop Taker with an oil stone or with fine emery cloth, then polish them with crocus cloth or on a buffing wheel. If the point of the Loop Taker is damaged to a minor degree only, sharpen it with a fine emery stone and polish it with crocus cloth or on a buffing wheel. The material must not be taken off from the side of the point which faces the Needle. All portions of the Loop Taker, which come in contact with the upper thread, must be perfectly smooth. If the point of the Loop Taker is broken off or if the Loop Taker is defective beyond repair, replace the old Loop Taker with a new one. |
| 34. The head of the small screw, used for adjusting the tension of the Bobbin Case, protrudes too much beyond the Tension Spring. This causes the upper thread to be caught and to break. | 34. Adjust this screw so that the upper thread can slide freely over it.
If necessary, remove carefully some material from the head of this screw by grinding or filing. Polish the head of the screw after this correction.
If a new screw can be obtained, replace the faulty screw with the new one. |
| 35. In machines which are provided with a Bobbin Case, the top surface of the Bobbin Case is damaged and has burrs or rough spots. This will cause the upper thread to be caught and prevent it from sliding freely around the Bobbin Case. As a result, there will be loops of thread on the underside of the seam or the upper thread will break. | 35. Smoothen the defective portions of the Bobbin Case with an oil stone or with fine emery cloth, then polish them with crocus cloth or on a buffing wheel. |
| 36.* The small coil spring inside of the Bobbin Case, which presses against the Bobbin Case Latch, is either broken or has become too weak, too much compressed or clogged with lint and dirt. The Bobbin Case Latch, therefore, does not close entirely and the Latch Lever thus prevents the upper thread from sliding freely around the Bobbin Case. The thread breaks. | 36. Take out the Latch and the Latch Lever from the Bobbin Case, then remove the defective small coil spring with a needle. Clean the spring with a needle, stretch it somewhat, if necessary, then replace it in the Bobbin Case. If the spring is broken, badly deformed or too weak, replace it with a new spring. |
| 37. In horizontal axis Rotary Hook machines, the portions of the Bobbin Case Holder and of the Bobbin Case Holder Position Bracket, which engage each other, have rough spots or sharp edges which cut the thread. | 37. Smoothen these portions with an oil stone or with fine emery cloth, then polish them with crocus cloth or on a buffing wheel. |
| 38. The Hook or the Bobbin Case may possess an incorrect shape which does not permit the upper thread to slide freely around these parts. | 38. Remove the Slide Plate from the bed of the machine, turn the Balance Wheel by hand and observe how the upper thread slides around the Hook or the Bobbin Case.
Take the aforementioned parts out of the machine, and with fine emery cloth remove any excess material from those portions where the upper thread gets caught. Polish these portions with crocus cloth or on a buffing wheel. If not successful, replace the defective part with a correct one. |
| 39. The Loop Taker (Hook) is not adjusted (timed) correctly in relation to the Needle. | 39. Adjust the machine so that the point of the Loop Taker enters the loop of the upper thread at the correct time. For "timing," follow this general rule: The Needle must have risen about 3/32 of an inch from its lowest position at the moment the point of the Loop Taker is just at the center of the rising needle. At this moment the point of the Loop Taker must be about 1/16 of an inch above the eye of the Needle. |
| 40. Some of the parts along which the upper thread passes (Thread Guides, Tension Discs, Thread Take-up Spring, Thread Take-up Lever, etc.) may have become rough or sharp and possess deep sharp grooves. | 40. With fine emery cloth or with emery cord remove all rough or sharp portions and the grooves, worn by the upper thread into these parts. If these parts are too badly worn, replace them with new parts. |

*Applies only to machines with horizontal axis hooks.

Uneven Thread (Needle Thread) Breaks—continued

Cause	Solution
41. The top edge and the inside of the stitch hole in the feed dog have become rough, sharp or chipped. This may be due to wear or to breaking of needles.	41. Smoothen the stitch hole with fine emery cord. If the damage is excessive, replace the defective feed dog with a new one.
42. The Needle is too close to the edge of the slot (or the stitch hole) in the Presser Foot and rubs against the Presser Foot.	42. Check the straightness of the needle and replace it, if necessary, with a new straight Needle. If the Presser Foot is not correctly aligned, adjust it as follows: Loosen the screw which holds the Presser Bar in position. This screw is located behind the Face Plate of the machine. Turn the Presser Bar until the Needle goes through the center of the slot (or the stitch hole) in the Presser Foot, then tighten the aforementioned screw firmly.
43. The Needle is too close to the Loop Taker (Hook) and rubs against the point of the Loop Taker.	43. Check the straightness of the Needle and replace it, if bent, with a new straight Needle. If the Needle still touches the point of the Loop Taker, adjust the clearance between Needle and Loop Taker by moving the Loop Taker somewhat from the Needle. The point of the Loop Taker should be set as close as possible to the Needle without touching it.
44. The portions of the Presser Foot, close to which the Needle passes, are rough, sharp or chipped.	44. Remove the Presser Foot and smoothen the defective portions with fine emery cloth. Polish them with crocus cloth afterwards.
45. The Balance Wheel revolves in the wrong direction.	45. The Feed Dog must move the fabric away from the operator. Observe the Feed Dog and change direction of motor so that the above requirement is met.
46. Sometimes the fabric to be sewn may cause breakage of the upper thread.	46. Experiment with various grades of thread and with different thread tensions. Eventually change tension and movement of the Thread Take-up Spring. It may also be necessary to change the timing of the Feed Dog if the same type of fabric is being sewn for a greater length of time.
47. A needle thread of the wrong twist is used, causing the thread to unravel or to break.	47. Use a needle thread with the twist recommended for the machine in use. Left twist thread is required for single needle machines.

Notes

Lower Thread (Bobbin Thread) Breaks

Cause

1. The tension of the lower thread is too tight.
2. The Bobbin Case is threaded incorrectly.
3. The Bobbin is wound too full and cannot revolve freely in the Bobbin Case.
4. Lint or dirt have accumulated in the Bobbin Case, thus preventing the Bobbin from revolving freely.
5. The Bobbin (inserted in the Bobbin Case) is bent and cannot revolve freely.
6. The edges of the bobbin flanges are rough, sharp, or have nicks.
7. The edges of the Tension Spring on the Bobbin Case are rough or sharp. The thread has cut a groove into the Tension Spring.
8. Lint, dirt or a piece of thread have accumulated underneath the Tension Spring of the Bobbin Case.
9. The pressure upon the fabric is too heavy.
10. The lower thread runs incorrectly from the Bobbin Case up through the stitch hole of the feed dog. This causes the lower thread to be caught and torn by the point of the Loop Taker (hook). This may happen if either the Bobbin Case is damaged and cannot be seated correctly in the machine, or if the Hook is damaged in a manner so as to prevent the Bobbin Case from being seated correctly.
11. The lower thread runs incorrectly from the Bobbin Case up through the stitch hole of the feed dog and is caught and pierced by the Needle.
12. The stitch hole in the feed dog has rough spots or sharp edges.
13. The end of the small screw, inside of the Bobbin Case, presses against the Bobbin and prevents it from revolving freely.
14. There may be rough or sharp spots at any of the holes, slots and edges of the Bobbin Case, where the lower thread passes.
15. The Feed Dog is adjusted too low. The lower thread catches somewhere on the Feed Dog and breaks.
16. The Feed Dog has a rough or sharp spot somewhere at its underside. The lower thread, sliding over this defective portion, breaks.

Solution

1. Loosen the tension of the Tension Spring on the Bobbin Case by means of the Tension Adjusting Screw.
2. Thread the Bobbin Case correctly.
3. Remove some of the thread so that the Bobbin can revolve freely in the Bobbin Case.
4. With a pointed pin remove lint and dirt from these parts. Clean with kerosene, then dry thoroughly.
5. Replace the defective Bobbin with a new one.
6. Remove the Bobbin and smoothen the defective portion with an oil stone. If badly defective, replace the old Bobbin with a new one.
7. Smoothen, if possible, the defective portion of the spring with an oil stone. If the damage is too severe or if the thread has worn a deep groove in the underside of the Tension Spring, replace the old spring with a new one.
8. Remove the Tension Spring. Clean all parts with kerosene, then dry them thoroughly. Replace the Tension Spring and adjust it correctly.
9. Reduce the pressure upon the Presser Foot.
10. Remove the Slide Plate and observe how the lower thread runs from the Bobbin Case to the underside of the feed dog. Replace the defective part (Bobbin Case), if the damage cannot be repaired.
11. Remove the Slide Plate and observe how the lower thread runs from the Bobbin Case, to the underside of the feed dog. Check also whether the Needle is of correct length and whether it is inserted properly in the Needle Bar. Eliminate any interference of the Needle with the lower thread by either exchanging the wrong Needle with a correct one, by pushing the correct Needle entirely up in the Needle Bar or by adjusting the Needle Bar upward in the machine, if it is set too low.
12. Smoothen the stitch hole in the feed dog with fine emery cord.
13. If this small screw has become loose, tighten it firmly. If the trouble still persists, remove the screw and carefully file or grind off part of the material from the end of this screw until the Bobbin revolves freely. If necessary, replace the defective screw with a new one.
14. With fine emery cloth or with emery cord smoothen these defective portions, then polish them with crocus cloth or on a buffing wheel.
15. Adjust the Feed Dog to its correct position by raising somewhat the Feed Bar to which the Feed Dog is attached.
16. Smoothen the defective portion of the Feed Dog with an oil stone or with fine emery cloth. Polish with crocus cloth.

-Lower Thread (Bobbin Thread) Breaks—continued

Cause

17. The teeth of the Feed Dog are too sharp and cut the lower thread.
18. There are rough spots or sharp edges somewhere below the bed of the machine where the lower thread passes.
19. The lower thread is of poor quality. The thread may be too weak or rotten due to improper storage. The thread may have small knots which cannot pass underneath the Tension Spring of the Bobbin Case.

The Needle Breaks

Cause

1. The operator pulls the fabric during sewing. The Needle strikes an obstacle and bends or breaks.
2. Some portions of the fabric are too hard or too thick. The Needle bends or breaks.
3. The Needle has a blunt point and cannot penetrate the fabric.
4. The Needle is held loosely in the Needle Bar.
5. The Needle is bent and strikes the Presser Foot or the feed dog.
6. The Needle is too long and hits the Bobbin Case.
7. The Needle is set too low.
8. The stitch hole in the Feed Dog is too small for the Needle in use.
9. The Throat Plate is not held firmly in place. Its screws are not tightened securely. The Throat Plate shifts around and is being hit by the Needle.
10. The Presser Foot is not attached firmly to the Presser Bar and shifts sideways. The Needle hits the Presser Foot.
11. The Presser Foot is not lined up correctly in the machine and is being struck by the Needle.
12. The Hinge Type Presser Foot, when installed, is worn excessively. The lower portion (plate) of the Presser Foot has too much looseness and shifts sideways, causing the Needle to strike it.
13. The upper thread is too heavy for the Needle in use. The Needle bends, strikes the Throat Plate or Feed Dog and breaks.
14. The upper thread has knots which cannot pass through the eye of the Needle.

Solution

17. With a flat oil stone or with a strip of fine emery cloth, which is folded over a flat file, gently remove the keen sharpness from the teeth of the Feed Dog.
18. Examine all parts along which the lower thread passes. Smoothen any defective portions with fine emery cloth and polish them with crocus cloth.
19. Replace the inferior thread with one of good quality.

Solution

1. The fabric must not be pulled during sewing. The machine alone must feed the fabric.
2. Sew **SLOWLY** over such hard or thick portions of the fabric. If necessary, use a heavier Needle.
3. Replace the blunt Needle with a new one which is pointed correctly.
4. Insert a new Needle and make certain to tighten the needle clamping screw firmly.
5. Replace the defective Needle with a new straight Needle.
6. Replace the wrong Needle with one of correct length.
7. Insert a new Needle and push it entirely up into the Needle Bar. If the Needle Bar is set too low, adjust it correctly.
8. Select a Feed Dog with a sufficiently large stitch hole. The Needle must go through the center of the stitch hole.
9. Locate the Throat Plate correctly and tighten firmly the throat plate screws.
10. Tighten firmly the Presser Foot Screw.
11. Line up the Presser Foot as follows: Loosen the screw which holds the Presser Bar in position. This screw is located behind the Face Plate of the machine. Now turn the Presser Bar until the Needle goes through the center of the slot (or of the stitch hole) in the Presser Foot. Tighten firmly the above screw after this adjustment.
12. Replace the worn Presser Foot with a new one.
13. Replace the wrong Needle with a correct one, or change the size of the upper thread. Consult the Needle and Thread" chapter.
14. Replace the inferior thread with one of good quality.

The Needle Breaks—continued

Cause	Solution
15. There is not sufficient pressure on the Presser Foot while sewing heavy fabrics.	15. When sewing heavy fabrics, increase the pressure on the Presser Foot.
16. The user of the machine removes the fabric from underneath the Presser Foot without releasing the upper thread tension.	16. Every time the fabric is withdrawn from the machine, the Presser Bar must be raised to its highest position by means of the Presser Bar or knee Lifter. This will release the tension of the upper thread. The fabric must always be withdrawn AWAY from the operator.
17. The Needle is still in the fabric while the operator tries to remove the material from the machine.	17. The Needle must always have risen ABOVE the fabric before the material is removed from the machine.
18. Dirt in the Needle Clamp prevents the Needle from stitching straight into the fabric.	18. Remove all dirt from the Needle Clamp, insert a new straight Needle and tighten firmly the screw which holds the Needle.
19. The lower end of the Needle Bar is bent. The Needle, therefore, does not stitch straight into the fabric.	19. If the machine still turns easily, bring the Needle Bar up to its highest position and tap its lower end lightly with a hammer until the straight Needle goes through the center of the stitch hole in the feed dog. If the machine turns heavily, remove the bent Needle Bar and replace it with a new one.
20. The Needle Bar or the Bearings of the Needle Bar, are worn excessively. The Needle Bar sways sideways, the Needle strikes the Presser Foot, the Feed Dog or the Throat Plate and breaks.	20. Replace the worn Needle Bar or the worn Needle Bar Frame with new parts.
21. The Thread Take-up Spring (Check Spring) is not adjusted correctly. It exerts too much pull on the upper thread at the moment the Needle enters the fabric. The Needle bends, strikes the feed dog, etc. and breaks.	21. Adjust the Thread Take-up Spring. The loop of this spring must have finished its upward motion at the moment the Needle enters the fabric.
22. The Thread Take-up Lever is not adjusted correctly and pulls the upper thread at the moment the Needle enters the fabric. The Needle bends, strikes the feed dog, etc. and breaks.	22. Adjust the Thread Take-up Lever. This lever must move downward and "give" thread when the Needle enters the fabric.
23. The point of the Loop Taker is too close to the Needle.	23. Adjust the clearance between the Needle and the Loop Taker by moving the Loop Taker somewhat away from the Needle. The point of the Loop Taker should be set as close as possible to the Needle without touching it.
24. There is no material between Presser Foot and Throat Plate during sewing. The thread gets entangled below the Throat Plate and the Needle breaks.	24. Make certain that there is always material between Presser Foot and Throat Plate during sewing.

Skipping Stitches

Cause	Solution
1. The machine is not threaded correctly.	1. Check whether the upper thread runs correctly from the spool of thread to the Needle. See illustration showing threading of the machine being used.
2. An incorrect Needle is used in the machine. The Needle may be too short or too long.	2. Remove the wrong Needle and insert a Needle recommended for the machine in use.
3. The Needle is inserted incorrectly in the Needle Bar. The eye of the Needle is turned in the wrong direction.	3. Insert the Needle so that its eye is at a right angle with the direction of sewing and the short groove of the Needle faces the point of the Loop Taker (Hook).
4. The Needle is bent and does not stitch straight into the fabric.	4. Replace the bent Needle with a new straight needle.
5. Lint or dirt in the Needle hole prevent the Needle from stitching straight into the fabric.	5. Remove lint and dirt from the Needle Clamp, insert a new straight Needle and tighten firmly the screw which holds the Needle.

Skipping Stitches—continued

Cause	Solution
6. The Needle is too close to the edge of the stitch hole in the Feed Dog and even strikes the edge of this hole.	6. Check whether the Needle is bent. Replace a bent Needle with a new straight Needle. Check also whether the Feed Dog Screws are loose and tighten these screws firmly, if necessary.
7. The stitch hole in the Feed Dog is too large.	7. Replace the Feed Dog with one which has a smaller stitch hole.
8. The grooves in the Needle are clogged with dirt and do not permit the loop of the upper thread to form properly.	8. Clean the Needle with a soft rag. Be careful not to bend the Needle.
9. The slot (or the stitch hole) in the Presser Foot is too wide (or the stitch hole is too large). This causes the rising Needle to carry the fabric with it when sewing over thin fabrics, thus preventing the loop of the upper thread to form properly.	9. Replace the incorrect Presser Foot with one having a correct slot (or stitch hole).
10. If a one-piece Presser Foot is used, the foot, when sewing from thick to thin fabrics, or conversely, does not hold the fabric down firmly.	10. Hold the fabric down by hand while sewing, or replace the one-piece Presser Foot with a Hinged Presser Foot.
11. The pressure of the Presser Foot upon the fabric is insufficient. The fabric is not held down firmly.	11. Hold the fabric down by hand while sewing, or replace the one-piece Presser Foot with a Hinged Presser Foot.
12. The pressure of the Presser Foot upon the fabric is insufficient. The fabric is not held down firmly.	12. Increase the pressure upon the fabric.
13. The Needle is too close to the edge of the slot (or of the stitch hole) in the Presser Foot.	13. Line up the Presser Foot as follows: Loosen the screw which holds the Presser Bar in position. This screw is located behind the Face Plate of the machine. Now turn the Presser Bar until the Needle goes through the center of the slot (or of the stitch hole) in the Presser Foot. Tighten firmly the above screw after this adjustment.
14. The Bobbin is empty.	14. Replace with a filled Bobbin.
15. The end of the lower thread, which extends from the Bobbin, is too short and cannot be carried along and brought above the Feed Dog by the upper thread.	15. Pull more thread (about four to five inches) out of the Bobbin Case.
16. The upper thread is too heavy for the Needle in use.	16. Replace the Needle with one of the correct size. Consult the "Needle and Thread" chapter.
17. The Needle is too heavy for the thread in use. The thread has too much space in the eye of the Needle.	17. Replace the Needle with one of the correct size. Consult the "Needle and Thread" chapter.
18. The thickness of the upper thread is not uniform. The thread has knots or heavy and thin portions.	18. Replace the inferior thread with one of uniform thickness.
19. The upper thread may be too soft and does not form a proper loop underneath the Throat Plate.	19. Replace the thread with one of proper quality. Use a somewhat stiffer thread.
20. Oil on the upper thread prevents proper formation of the loop underneath the Throat Plate.	20. Remove the oily portion of the thread and prevent the upper thread from getting soaked with oil. Carefully wipe oil from Needle, Throat Plate and Loop Taker (Hook) and feed dog.
21. The Thread Take-up Spring (Check Spring) is not adjusted correctly. It has too much tension or releases the upper thread too late.	21. Adjust the Thread Take-up Spring. The upper thread must become loose at the moment the Needle enters the fabric.

Skipping Stitches—continued

Cause

22. The Loop Taker (Hook) is timed too early or too late in relation to the Needle. If timed too early, the loop of the upper thread is still too small to be caught and entered by the point of the Loop Taker. If too late, the loop of the upper thread is already too large and twists sideways, thereby being missed by the point of the Loop Taker.
23. The clearance between the Needle and the point of the Loop Taker (Hook) is too large.
24. The point of the Loop Taker (Hook) is blunt, damaged or broken off.
25. The lower end of the Needle Bar is bent. The Needle, therefore, does not stitch straight into the fabric.
26. The Needle Bar or Needle Bar Frame is badly worn. The Needle Bar is too loose in its bearings and sways sideways.
27. The Needle Bar has play (lost motion) in vertical direction. This may be due to the Needle Bar linkage being badly worn.
28. The Throat Plate is not flat, but is slightly bent downward due to repeated dropping of the Presser.
29. The bottom surface of the Presser Foot does not rest fully (flush) upon the fabric.
30. The type of fabric to be sewn makes the formation of the loop of the upper thread difficult. The fabric may also be sticky and, therefore, does not permit the proper formation of the loop of the upper thread.
31. A needle thread of the wrong twist is used. The thread unravels and forms an improper loop above the needle eye, thereby being missed by the point of the Loop Taker (Hook).

Solution

22. Make certain that the Needle is pushed all the way up into the Needle Bar. Also check whether the Needle is timed correctly in relation to the Loop Taker. For "Timing" follow this general rule: The Needle must have risen about $\frac{3}{32}$ of an inch from its lowest position at the moment the point of the Loop Taker is just at the center of the rising Needle. At this moment the point of the Loop Taker must be about $\frac{1}{16}$ of an inch above the eye of the Needle (see page 00).
23. Bring the point of the Loop Taker closer to the Needle. The point of the Loop Taker should be set as close as possible to the needle without touching it.
24. If the point of the Loop Taker is worn or damaged to a minor degree only, sharpen it with a fine emery stone or with fine emery cloth, then polish it with crocus cloth or on a buffing wheel. The material of the Loop Taker must not be taken off from that side of the point which faces the Needle. If the point of the Loop Taker is broken off or if the Loop Taker is defective beyond repair, replace the old Loop Taker with a new one.
25. If the machine turns easily, bring the Needle Bar to its highest position, then tap the Needle Bar lightly with a hammer until the Needle goes through the center of the stitch hole in the Feed Dog.
26. Replace the worn Needle Bar with a new one. Replace also worn Needle Bar Frame.
27. Replace the worn and defective parts with new ones.
28. If facilities for repairs are available, place the old Throat Plate, top surface down, on a flat surface (surface plate) and straighten it by tapping it carefully with a hammer. If badly defective, replace the old Throat Plate with a new one.
29. Check whether there is lint or dirt between the Presser Foot and the Presser Bar. Remove lint or dirt and tighten firmly the Presser Foot Screw. Check whether the Presser Foot rests upon the machine. If the Presser Foot is defective, replace it with a Foot which rests with its entire bottom face upon the machine.
30. Experiment with various grades of threads and needles, until a proper stitch can be obtained. It may also be necessary to adjust the Loop Taker (Hook) in relation to the Needle in such a manner that a proper stitch can be obtained. Sometimes it will help to give a different tension to the upper thread or to the Thread Take-up Spring (Check Spring).
31. Use a needle thread with left twist.

Loops or Knots on Top Surface of Fabric.

The upper thread lies straight on the top surface of the fabric and the lower thread appears there in form of small knots.

Cause

1. The tension of the upper thread is too tight or the tension of the lower thread is too weak.
2. The Tension Spring of the Bobbin Case is bent out of its proper shape. This condition does not provide sufficient tension of the lower thread.
3. Lint, dirt, or pieces of thread have accumulated underneath the Tension Spring of the Bobbin Case.
4. Rusty or rough spots between the Tension Discs.

Solution

1. Loosen the tension of the upper thread or tighten the tension of the lower thread, until the tensions of both threads are correctly balanced.
2. Try to correct the deformed spring by carefully reshaping it with a small round-nosed pliers. If not successful, replace the defective spring with a new one.
3. Remove the Tension Spring. Clean the spring and the Bobbin Case, then replace the spring and adjust it correctly.
4. Remove rusty or rough spots with fine emery cloth and polish with crocus cloth. Replace badly defective Tension Discs with new ones.

Loops or Knots on the Underside of the Fabric

The lower thread lies straight on the underside of fabric and the upper thread appears there in form of loops or small knots.

Cause

1. The tension of the upper thread is too weak or the tension of the lower thread is too tight.
2. There are dirt, lint or pieces of thread between the Tension Discs.
3. The upper thread has cut deep grooves into the Tension Discs.
4. The Bobbin Case is not threaded correctly. The Bobbin unwinds itself in the wrong direction.
5. The head of the Tension Adjusting Screw of the Bobbin Case protrudes too much and catches and retards the upper thread.
6. The stitch hole in the Throat Plate or Feed Dog is too small.
7. The point of the Needle is bent over ("hooked point").
8. The Bobbin is not evenly wound. It unwinds itself irregularly.
9. The Bobbin is damaged or bent and does not revolve freely and evenly.
10. Lint or dirt in the Bobbin Case prevent the Bobbin from revolving freely.
11. The needle is not correctly timed in relation to the Loop Taker (Hook).

Solution

1. Tighten the tension of the upper thread, or loosen the tension of the lower thread, until the tensions of both threads are correctly balanced.
2. Take apart the upper tension, clean the Tension Discs thoroughly, then replace the upper tension and adjust it correctly.
3. Replace the defective Tension Discs with new ones.
4. Thread the Bobbin Case correctly.
5. Adjust this screw correctly. If this condition continues to persist, smoothen the head of this screw with fine emery cloth or replace the defective screw with a new one.
6. Replace the Throat Plate or Feed Dog with one which has a larger stitch hole.
7. Replace the defective Needle with a new one.
8. Replace the Bobbin with one which is wound evenly.
9. Replace the defective Bobbin with a new one.
10. With a pointed pin remove all dirt from this part. Clean with kerosene and dry thoroughly before replacing in the machine.
11. Make certain that the Needle is pushed all the way up into the Needle Bar and held there firmly. Adjust the point of the Loop Taker in relation to the Needle. For "Timing" follow this general rule: The Needle must have risen about 3/32 of an inch from its lowest position at the moment the point of the Loop Taker is just at the center of the rising Needle. At this moment the point of the Loop Taker must be about 1/16 of an inch above the eye of the Needle.

Loops or Knots on the Underside of the Fabric—continued

Cause

12. There is insufficient clearance between the Bobbin Case Holder and the Bobbin Case Holder Position Bracket in horizontal axis Rotary Hook Machines. On vertical axis rotating hook types may be insufficient clearance between tab extending from Bobbin Case to the left and the notch at the underside of the Throat Plate.
13. The mechanism for releasing the upper thread tension is incorrectly adjusted. It releases the tension of the upper thread too early.
14. The upper thread gets caught somewhere below the Throat Plate.
15. The Thread Take-up Spring (Check Spring) is not adjusted and does not work properly.

Solution

12. Turn the machine by hand and observe where the upper thread gets caught. Increase the clearance, where required, by carefully removing material from the component parts of the machine (by means of fine emery cloth). Smoothen the repaired portions with crocus cloth. The heaviest thread to be used must pass freely between these parts.
13. Adjust this mechanism so that the tension of the upper thread is released only during the last moment of the upward motion of the Presser Bar Lifter.
14. Examine Hook and Bobbin Case with regard to rough spots which may catch the upper thread and retard it, thus causing the loops on the underside of the fabric. Eliminate all rough spots with the aid of an oil stone or with fine emery cloth, then polish these portions with crocus cloth or on a buffing wheel.
15. Adjust the Thread Take-up Spring until it has the correct tension and its upward motion is just finished at the moment the Needle enters the fabric.

Uneven and Loose Stitches

Cause

1. The machine is not threaded correctly.
2. The upper thread is somehow prevented from unwinding itself from its spool.
3. Some of the parts of the tension mechanism for the upper thread are incorrectly assembled or are defective.
4. The upper thread is of irregular thickness and has also small knots.
5. The Needle is too heavy or too fine for the upper thread.
6. The upper thread is too coarse for the type of work.
7. The upper thread is too heavy or too thin in relation to the lower thread.
8. Some of the Thread Guides through which the upper thread passes are rough or have deep grooves.
9. The stitch hole in the Feed Dog is too small or too large.
10. The edges of the stitch hole in the Feed Dog, along which both threads slide, are not sufficiently smooth and retard the threads.
11. The edges of the slot (or of the stitch hole) in the Presser Foot are not smooth.

Solution

1. Check whether the upper thread runs correctly from the spool of thread to the Needle. See illustration showing threading of the machine being used. Consult instruction book.
2. Free the upper thread so that it can unwind itself easily.
3. Examine and adjust the tension mechanism for the upper thread. Replace defective parts or repair them, if possible.
4. Replace the inferior thread with one of good quality.
5. Select a Needle of proper size for the thread in use. Consult "Needle and Thread" chapter.
6. Use an upper thread suitable for the type of fabric in work. See "Needle and Thread" chapter.
7. It is desirable that both threads are of equal thickness. The lower thread may be somewhat thinner (but not heavier) than the upper thread.
8. Remove rough portions or grooves with fine emery cloth or emery cord. Replace badly defective parts with new ones.
9. Replace the feed dog with one which has the correct stitch hole.
10. With fine emery cord round off those portions of the stitch hole along which both threads slide.
11. With fine emery cloth or emery cord round off these edges of the Presser Foot.

Uneven and Loose Stitches—continued

Cause	Solution
12. The lower thread gets caught somewhere underneath the Tension Spring of the Bobbin Case.	12. Remove the Tension Spring. Examine the spring, or the Bobbin Case. Clean these parts thoroughly and remove any rough spots with fine emery cloth. If badly defective replace the old Tension spring with a new one.
13. The mechanism of the Thread Take-up Lever is worn. The Thread Take-up Lever cannot properly tie up the stitch.	13. Examine the mechanism of the Thread Take-up Lever and replace worn or defective parts with new ones.

Stitches are of Uneven Length

Cause	Solution
1. The pressure of the Presser Foot is insufficient. The fabric slips.	1. Increase the pressure of the Presser Foot.
2. The Presser Bar, due to gummed oil, cannot move freely up and down and sticks in the machine.	2. Remove the Presser Bar. Clean the bar and its bearings in the machine with kerosene, then replace the Presser Bar.
3. The Presser Foot is not firmly attached to the Presser Bar.	3. Tighten firmly the screw which holds the Presser Foot to the Presser Bar.
4. The Feed Dog is not firmly attached to the Feed Bar.	4. Tighten firmly the screws which hold the Feed Dog to the Feed Bar.
5. The teeth of the Feed Dog, and the portions around it, are clogged with lint and dirt.	5. Remove the Throat Plate and the Feed Dog, clean both parts thoroughly in kerosene, then replace them in the machine.
6. The Stitch Regulator Screw is loose—horizontal axis Rotating Hook Machines only.	6. Tighten the Stitch Regulator Screw firmly in the position desired.
7. The machine is adjusted for too short a stitch.	7. Increase the length of the stitch by means of the Stitch Regulator.
8. The bottom face of the Presser Foot does not rest fully (flush) on the Feed Dog.	8. Test the Presser Foot to find out how it rests on the Feed Dog. If facilities for repairs are available, bend the shank of the Presser Foot until the bottom face of the Foot rests fully (flush) on the Feed Dog. Test the Presser Foot again after this correction. If the Presser Foot cannot be corrected, replace it with a new Foot.
9. The lower end of the Presser Bar is bent. The Presser Foot, therefore, does not rest fully (flat) on the Feed Dog.	9. Bring the Presser Bar up to its highest position, then straighten the lower end of the bar by tapping it lightly with a hammer. Do not damage or distort the lower end of the bar during this straightening operation. Test the Presser Foot again after the correction of the Presser Bar.
10. The teeth of the Feed Dog do not rise sufficiently high above the Throat Plate during the feeding of the fabric.	10. Adjust the Feed Dog by raising somewhat the Feed Bar to which the Feed Dog is attached. The full depth of the teeth should be above the Throat Plate during the feeding of the fabric.
11. There is looseness or wear somewhere between the various parts of the feeding mechanism.	11. Check for looseness of connections, shafts and bearings. Adjust these parts so that no noticeable looseness can be observed. The various parts of the feeding mechanism must not bind after this adjustment. Replace badly defective parts and adjust them correctly.
12. The Feed Dog is set too high. As a result, during the backward movement of the Feed Dog (toward the operator) the teeth do not sink below the top surface of the Throat Plate. The fabric moves jerkily.	12. Adjust the Feed Dog by lowering somewhat the Feed Bar to which the Feed Dog is attached. The teeth of the Feed Dog must be below the top surface of the Throat Plate during the backward movement of the Feed Dog.
13. The teeth of the Feed Dog are worn and dull.	13. If the Feed Dog is worn excessively, replace it with a new Feed Dog.

Staggered Stitches

Cause	Solution
1. The pressure of the Presser Foot is insufficient. The fabric is not held down firmly.	1. Increase the pressure of the Presser Foot.
2. The Presser Foot is not firmly attached to the Presser Bar.	2. Tighten firmly the screw which holds the Presser Foot to the Presser Bar.
3. The Feed Dog is not firmly attached to the Feed Bar.	3. Tighten firmly the screws which hold the Feed Dog to the Feed Bar.
4. The Feed Dog is not adjusted straight in the machine.	4. Loosen somewhat the screws which hold the Feed Dog to the Feed Bar, then adjust the Feed Dog so that it is in line with the direction of sewing. Tighten the above screws firmly after this adjustment.
5. The Thread Take-up Spring (Check Spring) may be defective. It is also possible that it is not adjusted correctly and that its tension is too weak.	5. Replace a defective spring with a new one. Adjust the movement and the tension of the spring. The upward movement of the loop of the spring must have stopped at the moment the Needle is about to enter the fabric.
6. The loop of the Thread Take-up Spring is bent sideways.	6. Bend back the loop of this spring to its correct shape. If badly defective, replace the spring with a new one.
7. The color of upper and lower thread, being different from the color of the fabric, will make staggered stitches more obvious.	7. If possible, choose threads of the same color as that of the fabric to be sewn.

Improper Feeding of the Fabric.

Cause	Solution
1. The pressure of the Presser Foot is insufficient. The fabric slips and is not fed in a straight line. As a result, the seam may be curved.	1. Increase the pressure of the Presser Foot.
2. The Presser Bar is set too high in the machine. The Presser Foot does not rest firmly or does not rest at all upon the fabric.	2. Loosen the screw which holds the Presser Bar in position. This screw can be found behind the Face Plate of the machine. Push down the Presser Bar until the Presser Foot rests firmly on the Feed Dog. Make certain that the Presser Foot is lined up correctly with the Needle. Tighten the above screw securely.
3. The Presser Bar, due to gummed oil, cannot move freely up and down and sticks in the machine.	3. Remove the Presser Bar. Clean the bar and its bearings in the machine with kerosene, then replace the Presser Bar.
4. The Needle is bent. The fabric does not move in a straight line.	4. Replace the defective Needle with a new straight Needle.
5. The Stitch Regulator may be in the neutral position (on zero). The machine does not feed at all.	5. Set the Stitch Regulator to the desired length of stitch.
6. The Presser Foot is not firmly attached to the Presser Bar.	6. Tighten firmly the screw which holds the Presser Foot to the Presser Bar.
7. The bottom face of the Presser Foot is too short and, as a result, there is too much pressure on the fabric. The Feed Dog shifts the lower ply of the fabric against the upper ply.	7. Reduce the pressure of the Presser Foot. If possible, use a Presser Foot with a longer bottom plate.
8. The teeth of the Feed Dog are clogged with lint, dirt, and gummed oil. The fabric, therefore, cannot be moved properly by the Feed Dog.	8. Remove the Feed Dog, clean it thoroughly with a pointed pin or with a small stiff brush, frequently dipped in kerosene. Replace the Feed Dog in the machine.
9. The Feed Dog is not attached firmly to the Feed Bar.	9. Tighten firmly the screws which hold the Feed Dog to the Feed Bar.
10. An accumulation of lint, dirt and gummed oil, below the Throat Plate and between the rows of teeth of the Feed Dog hampers the free motion of the Feed Dog.	10. Remove the Throat Plate and Feed Dog. Clean them thoroughly with a small stiff brush and kerosene, then replace them in the machine.

Improper Feeding of the Fabric-continued

11. The Feed Dog is adjusted too low. Its teeth do not rise sufficiently high or do not rise at all above the Throat Plate.
12. The Feed Dog is adjusted too high. The Feed Dog hits against the underside of the Throat Plate and cannot move freely.
13. The teeth of the Feed Dog are worn blunt.
14. The bottom face of the Presser Foot rests with one side only on the Feed Dog.
15. The toes of the Presser Foot are not bent up sufficiently, causing the material to get caught when sewing from thin to thick fabrics.
16. The Throat Plate is bent downward due to repeated dropping of the Presser Foot. As a result, the fabric is not held firmly between Presser Foot and Throat Plate and slips.
11. Adjust the Feed Dog higher by raising the Feed Bar to which the Feed Dog is attached. The teeth of the Feed Dog, when in highest position, should be fully above the top surface of the Throat Plate.
12. Adjust the Feed Dog by lowering the Feed Bar to which the Feed Dog is attached. After this adjustment, make certain that the full height of the teeth is still visible above the Throat Plate when the Feed Dog is in its highest position.
13. If the Feed Dog is worn excessively, replace it with a new Feed Dog.
14. There may be several causes for this defect:
 - a. The bottom face of the Presser Foot is not square with the shank of the Foot.
Lower the Presser Foot and test how the entire bottom face rests on the Throat Plate or the Feed Dog. If facilities for repairs are available, bend the shank or grind the bottom face of the Presser Foot until it rests fully (flush) on Throat Plate and Feed Dog. If the defective Presser Foot cannot be corrected, replace it with a new Foot.
 - b. The lower end of the Presser Bar is bent.
Bring the Presser Bar to its highest position and straighten its lower end by tapping it lightly with a hammer. Do not damage the end portion of the Presser Bar during this procedure.
 - c. The teeth of the Feed Dog are worn down too much on one side. Replace it with a new Feed Dog.
15. Bend up the toes of the Presser Foot.
16. If facilities for repairs are available, place the old Throat Plate, top surface down, on a flat surface (surface plate) and straighten it by tapping it carefully with a hammer. If badly defective, replace the old Throat Plate with a new one.

The Fabric Puckers

Cause

1. The tension of the upper thread or that of the lower thread (or the tensions of both threads) are too tight and not correctly balanced.
2. The stitch is too long for the type of fabric in work.
3. The Feed Dog is set too high for the type of fabric in work.
4. The point of the Needle is blunt.
5. The Feed Dog does not rise with all its teeth simultaneously above the Throat Plate, and the teeth are not parallel to the top surface of the Throat Plate.
6. The fabric being sewn is thin and the pressure of the Presser Foot is too heavy.
7. The bottom plate of the Presser Foot, which rests on the Feed Dog, is too short, or the heel portion of the Presser Foot is not correctly rounded off.

Solution

1. Loosen the tensions of both threads and adjust them until they are correctly balanced. Try to sew with light tension only.
2. Reduce the length of stitch by means of the Stitch Regulator, especially when sewing fine fabrics.
3. Adjust the Feed Dog by lowering the Feed Bar to which the Feed Dog is attached.
4. Replace the defective Needle.
5. Adjust the Feed Dog so that all its teeth rise at the same time above the Throat Plate and the tips of all the teeth are parallel to the top surface of the Throat Plate. This is being done by adjusting the Feed Bar to which the Feed Dog is attached.
6. Reduce the pressure of the Presser Foot. Loosen both thread tensions.
7. Replace the old Presser Foot with one which has a longer bottom plate. The entire bottom plate must rest fully (flush) on the Feed Dog. Round off the heel portion of the Presser Foot on a fine emery wheel or with a strip of fine emery cloth, folded over a flat file.

The Machine Turns Heavily or Jams

Cause

1. Sewing Thread has wedged itself between the Balance Wheel and the arm of the machine.
2. The Balance Wheel is forced too tight against the arm of the machine.
3. There is too much pressure on the fabric.
4. The Feed Dog rubs against the edges of the slots in the Throat Plate.
5. Due to an accumulation of dirt and gummed oil between Throat Plate and Feed Dog, the Feed Dog presses against the underside of the Throat Plate.
6. The belt, running to the Balance Wheel, is too tight.
7. Dirt, pieces of thread, or broken off pieces of steel have wedged themselves between Bobbin Case Holder and Rotary Hook.
8. The bearings of the machine are tight due to rust or the use of improper oil. The oil in the bearings may be gummed. There may also be dirt in the bearings.
9. One or several parts inside of the machine are tight. This may be due either to improper assembly, lack of oil or some other reasons, such as bent parts, etc.
10. The Thread Take-up Lever is bent.
11. The Throat Plate is bent downward due to repeated dropping of the Presser Foot. The Feed Dog rubs against the underside of the Throat Plate.
12. The Needle Bar is bent.

Solution

1. Remove the Balance Wheel, and eliminate the thread with a sharp knife or a pointed pin.
2. Loosen the close contact between the Balance Wheel and the arm of the machine. This can be done by *lightly* tapping the Balance Wheel away from the arm of the machine with a hammer. Revolve the Balance Wheel by hand during this procedure.
3. Reduce the pressure of the Presser Foot.
4. Loosen somewhat the screws which hold the Feed Dog to the Feed Bar, then adjust the Feed Dog so that it can move freely in the slots of the Throat Plate. Tighten the Feed Dog Screws firmly after this adjustment. Replace the Throat Plate if the slots in it are badly defective.
5. Remove Throat Plate and Feed Dog. Clean these parts thoroughly in kerosene and replace them in the machine. Also clean the portions of the machine to which these parts are attached.
6. Place a belt of correct length on the machine. The belt should have just enough tension so as not to slip.
7. Disassemble these parts, clean them thoroughly and replace them in the machine.
8. With an oil can squirt clean kerosene into all bearings and run the machine for a while. Oil the machine afterwards with good sewing machine oil. Do not use thick oil or vegetable oils.
If the machine cannot be made to run easily, as suggested above, it will be necessary to disassemble the machine, to clean its parts thoroughly in kerosene and to assemble it again.
9. Disassemble the machine systematically, always trying whether it turns already freely or not. Stop disassembling the machine once you can turn it freely. Examine all parts which were removed from the machine. Repair them, if necessary, and replace badly defective parts with new ones. Clean all parts thoroughly in kerosene. Assemble now carefully the machine again, making certain that it turns freely every time a part has been inserted. Oil the machine properly after it has been assembled.
10. Remove the Thread Take-up Lever and straighten it, if possible. Replace with a new Thread Take-up Lever if the old one is badly defective.
11. If facilities for repairs are available, place the old Throat Plate, top surface down, on a flat surface (surface plate) and straighten it by tapping it carefully with a hammer. If badly defective, replace the old Throat Plate with a new one.
12. Remove the Needle Bar, then turn the Balance Wheel by hand. If the machine turns easily now, it indicates that the Needle Bar is bent. Straighten the bent Needle Bar on a flat surface, if possible. Insert a new Needle Bar in the machine, if the old bar is defective beyond repair.

The Machine Turns Heavily or Jams—continued

Cause

13. The Arm Shaft of the machine is bent.
14. There is no material between Presser Foot and Throat Plate during sewing. The thread gets entangled below the Throat Plate and jams the Hook.

The Machine Runs Noisily

Cause

1. The machine is not sufficiently oiled.
2. The point of the Needle is blunt and causes a "knocking" noise when penetrating the fabric.
3. There is an accumulation of lint, dirt and gummed oil between the underside of the Throat Plate and the Feed Dog.
4. The Face Plate, Throat Plate, Feed Dog, Presser Foot, etc. may be loose on the machine.
5. The Feed Dog is set too high and knocks against the underside of the Throat Plate.
6. The Throat Plate is bent downward due to repeated dropping of the Presser Foot. The Feed Dog knocks against the underside of the Throat Plate.
7. Some of the bearings or some of the parts inside the machine are loose or worn excessively.
8. There is too much clearance between the Bobbin Case Holder and the Bobbin Case Holder Positioning Bracket.
9. In horizontal axis Rotating Hook Machines the Bobbin Case fits improperly on the post of the Bobbin Case Holder.
10. The Bobbin Case Holder is too loose in the Rotating Hook.
11. The Thread Take-up Lever is too loose on its bearings.

Solution

13. See whether the Balance Wheel wobbles or throws. This usually indicates that the Arm Shaft is bent. If the Arm Shaft is bent only slightly, turn the Balance Wheel by hand until its rim comes closest to the arm of the machine. Wedge a piece of hard wood between the arm of the machine and the Balance Wheel. Now hit carefully with a hammer against the wood in the direction toward the Balance Wheel, until the Balance Wheel revolves freely and perfectly round (without wobbling). If the Arm Shaft is bent badly, remove it from the machine and straighten it, or replace it with a new Arm Shaft.
 14. Turn the Balance Wheel slowly by hand to bring the Needle above the Throat Plate. Remove the Throat Plate, then eliminate the entangled thread below the Throat Plate. Replace the Throat Plate. Make certain that there is always material between Presser Foot and Throat Plate during sewing.
- ### Solution
1. Oil the machine wherever lubrication is required.
 2. Replace the defective Needle with a new one.
 3. Remove Throat Plate and Feed Dog. Clean them thoroughly with a small stiff brush and kerosene, then replace them on the machine.
 4. Eliminate any looseness by tightening firmly the screws which hold these parts to the machine.
 5. Remove the Throat Plate and adjust the Feed Dog by lowering the Feed Bar to which the Feed Dog is attached.
 6. If facilities for repairs are available, place the old Throat Plate, top surface down, on a flat surface (surface plate) and straighten it by tapping it carefully with a hammer. If badly defective, replace the old Throat Plate with a new one.
 7. Examine all bearings and connections of movable parts (shafts, needle bar, thread take-up lever, etc. and eliminate excessive looseness by inserting new bearing bushings, tightening loose connections or replacing worn machine parts with new ones.
 8. Replace the Bobbin Case Holder or the Positioning Bracket or replace both worn parts with new ones, if necessary.
 9. Replace the incorrect part (Bobbin Case or Bobbin Case Holder) with a correctly fitting part.
 10. Replace the worn Bobbin Case holder with a new one. If necessary, replace also the worn Rotating Hook with a new one.
 11. If the Thread Take-up Lever is badly worn, replace this lever with a new one.

The Machine Runs Noisily —continued

Cause

12. In a gear-equipped machine, the gears are not lined up correctly and do not mesh properly.

Solution

12. Adjust the gears so that they are in correct contact with each other. New gears should be run in for a while with a paste of oil and oilstone powder. The gears and the portions of the machine close to the gears must be thoroughly cleaned with kerosene after this procedure. Lubricate the gears after cleaning. Use grease as a lubricant.

The Fabric is Damaged During Sewing

Cause

1. There is too much pressure on the fabric. The Feed Dog, therefore, cuts into the fabric.
2. The teeth of the Feed Dog are too sharp and cut into fabric.
3. The edges of the slots in the Throat Plate are sharp and burry, thus catching and damaging the fabric.
4. The bottom face of the Presser Foot is damaged and rough.

Solution

1. Reduce the pressure of the Presser Foot.
2. Remove the knife-like sharpness from the teeth with a flat oil stone or with a strip of fine emery cloth which is folded over a flat file.
3. With a strip of fine emery cloth, folded over a flat file, remove the burrs and the sharp portions on top of the Throat Plate. Smoothen the top surface of the Throat Plate with crocus cloth.
4. Smoothen the bottom face of the Presser Foot with a strip of fine emery cloth which is folded over a flat file. Polish with crocus cloth. If the Presser Foot is badly defective, replace it with a new foot.