

SINGER
138W101,W102,W103

USE ONLY **SINGER*** OILS and LUBRICANTS

*They insure freedom from lubricating trouble and
give longer life to sewing equipment*

The following are the correct lubricants for this machine:

TYPE B — MANUFACTURING MACHINE OIL, HEAVY
GRADE

When a stainless oil is desired, use:

TYPE D — MANUFACTURING MACHINE OIL, STAIN-
LESS, HEAVY GRADE

OTHER **SINGER** LUBRICANTS

TYPE E — STAINLESS THREAD LUBRICANT

For lubricating the needle thread of sewing machines for
stitching fabrics or leather where a stainless thread lubri-
cant is required.

TYPE F — MOTOR OIL

For oil lubricated motors and plain bearings in power
tables and transmitters.

NOTE: All of the above oils are available in 1 quart,
1 gallon and 5 gallon cans or in 55 gallon drums.

GEAR LUBRICANT

This specially prepared grease is recommended for gear
lubrication on manufacturing sewing machines.

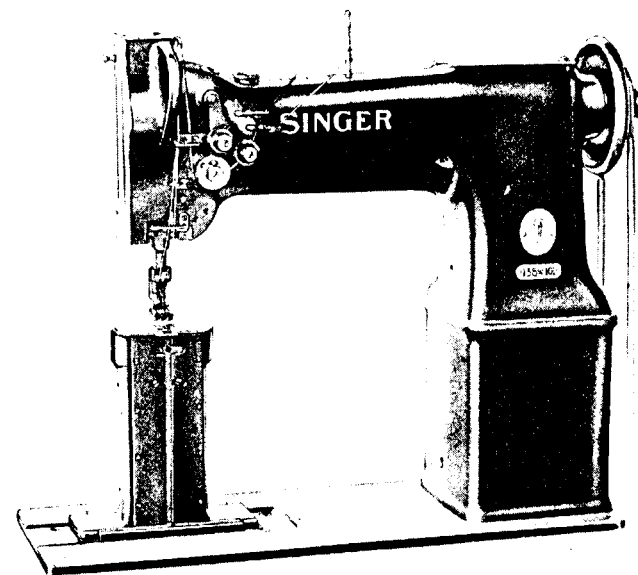
BALL BEARING LUBRICANT

This pure grease is specially designed for the lubrication
of ball bearings and ball thrust bearings of motors and
electric transmitters, ball bearing hangers of power tables,
etc. Furnished in 1 lb. and 4 lb. tins.

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Form 2312w

INSTRUCTIONS FOR USING AND ADJUSTING **SINGER*** SEWING MACHINES



138w101, 138w102 and 138w103

POST BED

LOCK STITCH

TWO NEEDLES

COMPOUND FEED

*A TRADE MARK OF

THE SINGER MANUFACTURING CO.

TO ALL WHOM IT MAY CONCERN:

The improper placing or renewal of the Trade Mark "SINGER" or any other of the Trade Marks of The Singer Manufacturing Company (all of which are duly Registered Trade Marks) on any machine that has been repaired, rebuilt, reconditioned, or altered in any way whatsoever outside a SINGER factory or an authorized SINGER agency is forbidden.

THE IMPORTANCE OF USING **SINGER*** PARTS AND NEEDLES IN **SINGER** MACHINES

The successful operation of SINGER machines can only be assured if SINGER parts and needles are used. Supplies are available at all SINGER Shops for the Manufacturing Trade, and mail orders will receive prompt attention.

SINGER Needles should be used
in SINGER Machines.
These Needles and their Containers
are marked with the
Company's Trade Mark "SIMANCO.*" 1

Needles in Containers marked
"FOR SINGER MACHINES"
are NOT **SINGER** made needles. 2

DESCRIPTION

Machine 138W101 has a post bed and compound feed for felling overalls, corsets, brassieres, underwear, etc., and is especially adapted for closing and inserting sleeves of raincoats, barbers' and doctors' coats and denim jumpers, also for general tubular work.

It has two needles and two rotary sewing hooks on vertical axes and simultaneously makes two parallel lines of lock stitching. The distance between the two lines of stitching may be from $\frac{3}{32}$ to $\frac{3}{4}$ inch, as ordered.

Machine 138W102 is the same as Machine 138W101 except that it has alternating pressers in addition to a compound feed and is intended for stitching back stays on heavy unlined shoes and top lace boots.

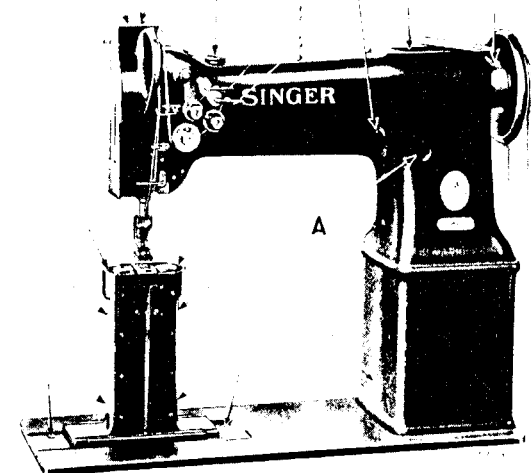
Machine 138W103 is the same as Machine 138W102 except that it is designed for leather work requiring heavy thread, having sewing hooks and bobbin cases especially constructed for this purpose.

SPEED

The maximum speed recommended for Machines 138W101 and 138W102 is 3000 revolutions per minute. The maximum speed recommended for Machine 138W103 is 2400 revolutions per minute. The machines should be run slower than the maximum speed until the parts which are in movable contact have become glazed by their action upon each other. When the machines are in operation, the balance wheel should always turn over toward the operator.

TO OIL THE MACHINES

When the machine is received from the factory, it should be thoroughly cleaned and oiled. Use "TYPE B" or "TYPE D" OIL sold only by Singer Sewing Machine Company. For description of these oils, see inside front cover.



Oil should be applied at each of the places designated by arrows in Figs. 2, 3, 4, 5 and 6. When the machine is in continuous use, it should be oiled at least twice each day. Swing back the cover which is on the top of the machine at the right, and oil the bearings which are thus uncovered, then replace the cover.

Fig. 2. Oiling Points at the Front of the Machine

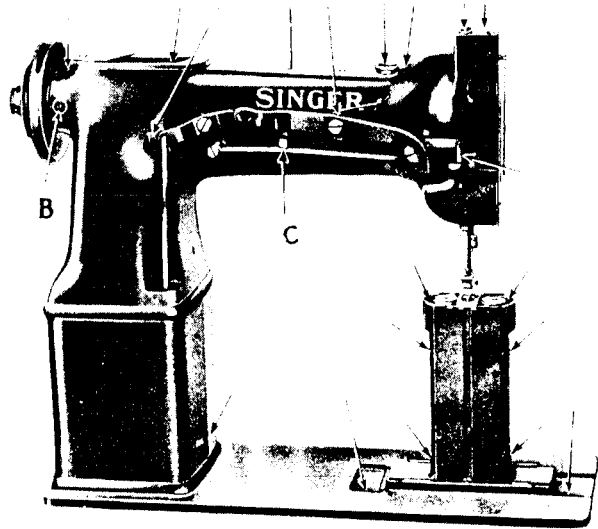


Fig. 3. Oiling Points at the Back of the Machine
Also Adjustments on the Machine

Turn the machine back on its hinges and apply oil at the places designated by arrows in Fig. 4 and all other places where there are parts in movable contact, then bring the machine forward into place.

The small felt pad on the side of the bobbin case should be kept wet with oil to lubricate the hook race.

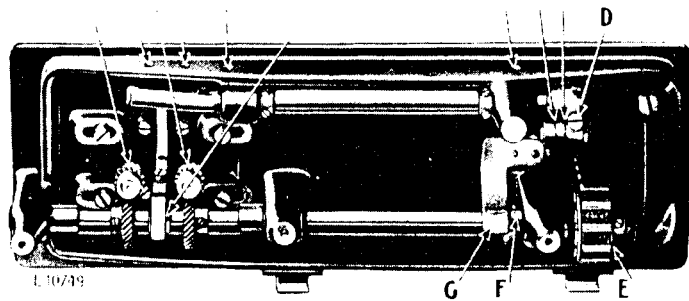


Fig. 4. Base of Machine, Showing Oiling Points
Also Adjustments on the Machine

Loosen the thumb screw in the upper end of the face plate, turn the face plate upward and oil the wick and bearings which are thus uncovered, then turn down the face plate and tighten the thumb screw.

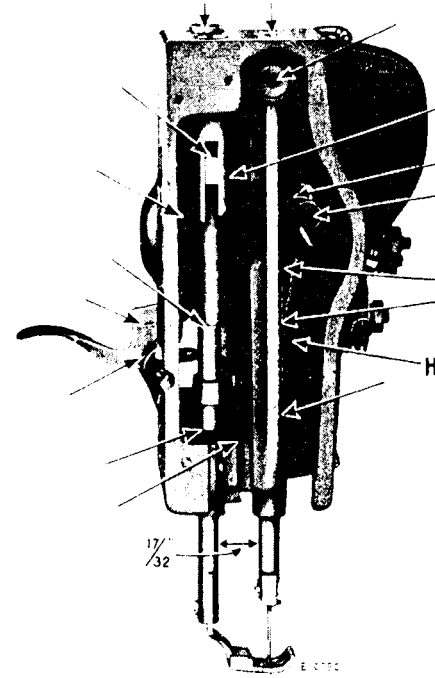


Fig. 5. End View of Machine 138W101,
Showing Oiling Points Also Adjustment
on the Machine

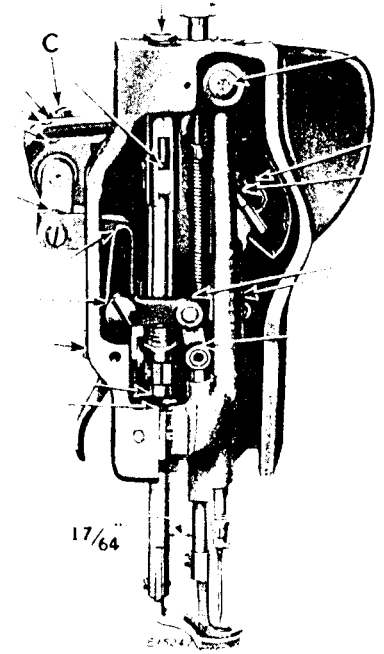


Fig. 6. End View of Machines 138W102
and 138W103, Showing Oiling Points
Also Adjustment on the Machines

NEEDLES

Needles for Machine 138W101 are of Class and Variety 135x7 and are made in sizes 9, 10, 12, 14, 16, 18, 20, 22 and 24.

Needles for Machine 138W102 are of Class and Variety 126x10 and are made in sizes 18, 20 and 22.

Needles for Machine 138W103 are of Class and Variety 135x20 and are made in size 25.

The size of the needle to be used should be determined by the size of the thread, which must pass freely through the eye of the needle. If rough or uneven thread is used, or if it passes with difficulty through the eye of the needle, the successful use of the machine will be interfered with.

Orders for needles must specify the **quantity** required, the **size** number, also the **class** and **variety** numbers separated by **x**.

The following is an example of an intelligible order:

"100 No. 14, 135x7 Needles."

The best results will be obtained in using the needles furnished by the Singer Sewing Machine Company.

THREAD

Left twist thread should be used in the needles. Either right or left twist can be used in the bobbins.

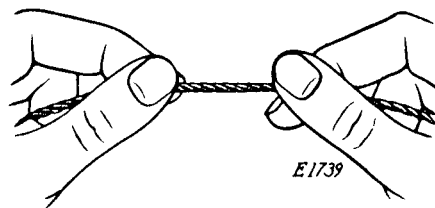


Fig. 7. How to Determine the Twist

Hold the thread as shown above. Turn the thread over toward you between the thumb and forefinger of the right hand; if left twist, the strands will wind tighter; if right twist, the strands will unwind.

TO SET THE NEEDLES

Turn the balance wheel over toward you until the needle bar moves up to its highest point; loosen the set screws in the needle holder and put the needles up into the holder as far as they will go, the inside needle or the one nearest the upright part of the arm having its long groove toward the left, and the outside needle or the one farthest from the upright part of the arm having its long groove toward the right, the eyes of both needles being directly in line with the machine bed, then tighten the set screws.

TO REMOVE THE BOBBINS

Draw out the slide plates on the top of the post. Turn the balance wheel over toward you until the needle bar moves up to its highest point.

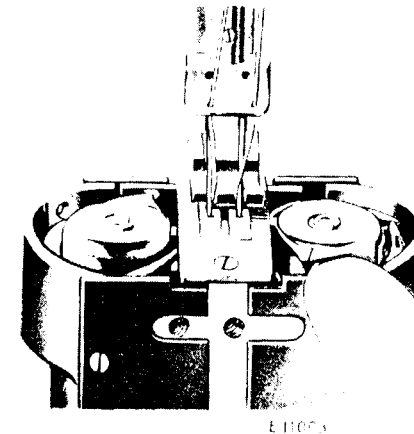


Fig. 8. Removing the Bobbin

Place the thumb or finger under the projection on the side of the bobbin case caps as shown in Fig. 8 then lift out the caps and remove the bobbins.

TO WIND THE BOBBIN

(See Fig. 9)

Fasten the bobbin winder to the table with its driving pulley in front of the machine belt, so that the pulley will drop away from the belt when sufficient thread has been wound upon the bobbin.

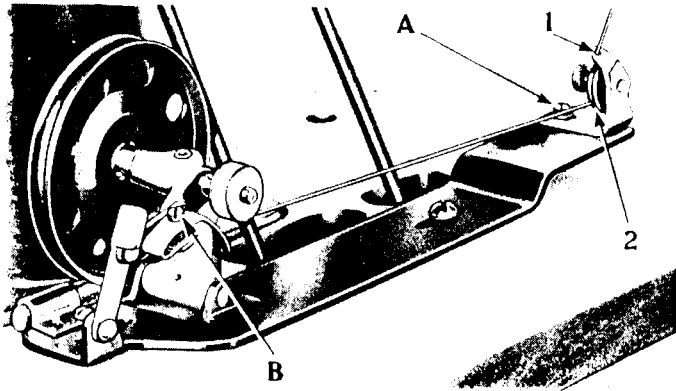


Fig. 9. Winding the Bobbin

Place the bobbin on the bobbin winder spindle and push it on as far as it will go.

Pass the thread down through the thread guide 1 in the tension bracket, around the back and between the tension discs 2. Then wind the end of the thread around the bobbin a few times, push the bobbin winder pulley over against the machine belt and start the machine.

When sufficient thread has been wound upon the bobbin, the bobbin winder will stop automatically.

If the thread does not wind evenly on the bobbin, loosen the screw A in the tension bracket and move the bracket to the right or left as may be required, then tighten the screw.

The amount of thread wound on the bobbin is regulated by the screw B. To wind more thread on the bobbin, turn the screw B inwardly. To wind less thread on the bobbin, turn the screw outwardly.

Bobbins can be wound while the machine is stitching.

TO THREAD THE BOBBIN CASE CAPS

Hold the bobbin between the thumb and forefinger of the right hand, the thread drawing on top from the left toward the right.



Fig. 10

With the left hand hold the bobbin case cap as illustrated (see Fig. 10), and place the bobbin into it.



Fig. 11

Then pull the thread into the slot in the edge of the bobbin case cap (see Fig. 11), and under the tension spring as shown in Fig. 12.



Fig. 12

To ensure the correct tension, draw the thread under the tension spring once or twice; this will remove any lint which may become lodged under the spring.

TO REPLACE THE BOBBIN CASE CAPS

To replace the bobbin case cap at the right of the post after threading, take the cap in the right hand holding the bobbin in the cap with the forefinger, and place it on the centre stud, then push down the latch B, having the thread at the left of the projection as shown in Fig. 13, and replace the slide plate.

To replace the left bobbin case cap after threading, take the cap in the left hand holding the bobbin in the cap with the forefinger, and place it on the centre stud of the left bobbin case, then push down the latch A, having the thread at the right of the projection as shown in Fig. 13, and replace the slide plate.

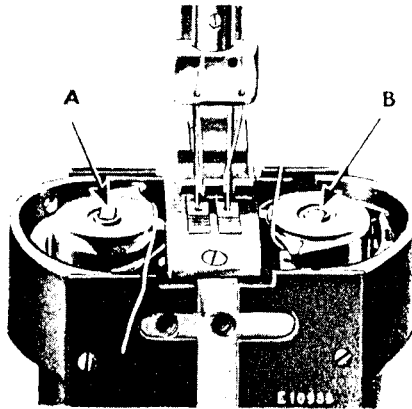


Fig. 13. Bobbin Case Caps Threaded and Replaced

Oil the bobbin case bearings in the sewing hook races each time a bobbin is replaced.

UPPER THREADING OF MACHINE 138W101

(See Fig. 14)

To thread the outside needle or the one farthest from the upright part of the arm, pass the thread from the unwinder from back to front through the hole 1 in the pin on top of the machine, then from right to left through the hole 2 in the pin, down through the hole 3, up through the hole 4 and down through the hole 5 in the thread guide at the front of the machine, over from right to left between the left tension discs 6, down under from right to left around the thread controller 7, up into the fork 8 of the thread controller against the pressure of the wire controller spring, up through the thread guide 9, up and from right to left through the upper hole 10 in the end of the thread take-up lever, down through the thread guide 9 again, and through

the thread guides 12 and 13, down through the left hole 14 in the needle holder and from right to left through the eye of the left or outside needle 15.

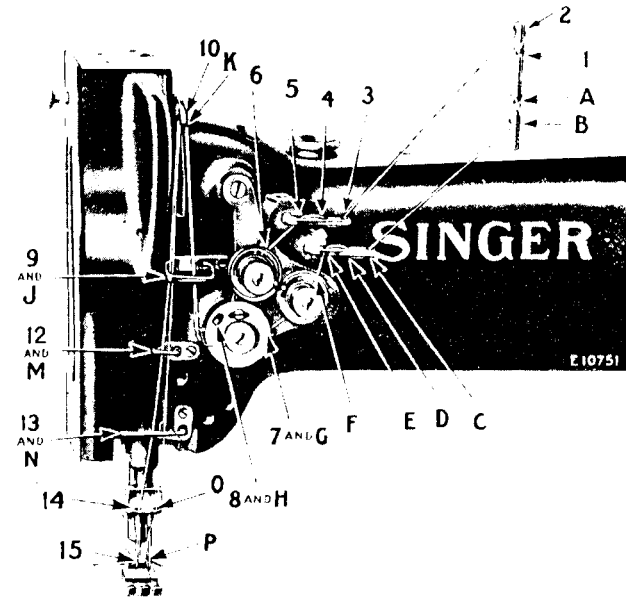


Fig. 14. Upper Threading of Machine 138W101

To thread the inside or the one nearest the upright part of the arm, pass the thread from the unwinder from back to front through the hole A in the pin on top of the machine, then from right to left through the hole B in the pin, down through the hole C, up through the hole D and down through the hole E in the thread guide at the front of the machine, under from right to left between the right tension discs F, down under from right to left around the thread controller G, up into the fork H of the thread controller against the pressure of the wire controller spring, up through the thread guide J, up and from right to left through the lower hole K in the end of the thread take-up lever, down through the thread guide J again, and through the thread guides M and N, down through the right hole O in the needle holder and from left to right through the eye of the right or inside needle P.

Draw about three inches of thread through the eye of each needle with which to commence sewing.

UPPER THREADING OF MACHINES 138W102 AND 138W103

(See Fig. 15)

To thread the outside needle or the one farthest from the upright part of the arm, pass the thread from the unwinder from right to left through the

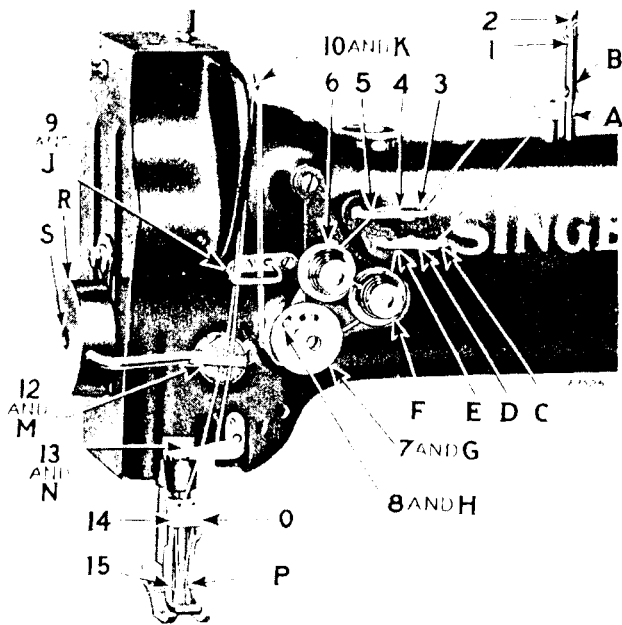


Fig. 15. Upper Threading of Machines 138W102 and 138W103

hole 1 in the pin on top of the machine, then from back to front through the hole 2 in the pin, down through the hole 3, up through the hole 4 and down through the hole 5 in the thread guide at the front of the machine, over from right to left between the left tension discs 6, down under from right to left around the thread controller 7, up into the fork 8 of the thread controller against the pressure of the wire controller spring, up through the thread guide 9, up and from right to left through the upper hole 10 in the end of the thread take-up lever, down through the thread guide 9 again, between the felt pad and felt pad retainer finger 12, through the thread guide 13, down through the left hole 14 in the needle holder and from right to left through the eye of the left or outside needle 15.

To thread the inside needle or the one nearest the upright part of the arm, pass the thread from the unwinder from back to front through the hole A in the pin on top of the machine, then from right to left through the hole B in the pin, down through the hole C, up through the hole D and down through the hole E in the thread guide at the front of the machine, under from right to left between the right tension discs F, down under from right to left around the thread controller G, up into the fork H of the thread controller against the pressure of the wire controller spring, up through the thread guide J, up and from right to left through the lower hole K in the end of the thread take-up lever, down through the thread guide J again, between the felt pad and the felt pad retainer finger M, through the thread guide N, down through the right hole O in the needle holder and from left to right through the eye of the right or inside needle P.

Draw about three inches of thread through the eye of each needle with which to commence sewing.

TO ADJUST THE THREAD LUBRICATOR ON MACHINE 138W102

When replenishing the lubricant supply, fill the reservoir R, Fig. 15 to about $\frac{1}{8}$ inch below the filler hole S, Fig. 15. To insure satisfactory results, use SINGER Thread lubricant.

The amount of lubrication of the thread is controlled by raising or lowering the felt pad holder 12, Fig. 15 above or below the level of the lubricant. For more lubricant, lower the felt pad holder. For less lubricant, raise the felt pad holder. The thread lubricator on Machine 138W103 is held in position by the bracket L, Fig. 21.

TO PREPARE FOR SEWING

With the left hand hold the ends of the needle threads, leaving them slack from the hand to the needles. Turn the balance wheel over toward you until the needles move down and up again to their highest point, thus catching the bobbin threads; draw up the needle threads and the bobbin threads will come up with them through the holes in the feed dog. Lay the threads back under the presser foot and close the slides.

TO COMMENCE SEWING

Place the material beneath the presser foot, lower the presser foot and commence to sew, turning the balance wheel over toward you.

TO REMOVE THE WORK

Have the thread take-up lever at the highest point, raise the presser foot, draw the work back and cut the threads close to the goods. Lay the ends of the threads back under the presser foot.

TO REGULATE THE PRESSURE ON MATERIAL

On Machine 138W101, the pressure on the material is regulated by the screw **C**, Fig. 3 at the back of the machine, the screw acting on a flat spring. To increase the pressure, turn this screw downwardly. To decrease the pressure, turn this screw upwardly. The pressure should be only heavy enough to enable the feed to move the work along evenly.

On Machines 138W102 and 183W103, the pressure on the material is regulated by the thumb screw **J**, Fig. 21 at the top of the machine. To increase the pressure, turn the thumb screw **J** downwardly. To decrease the pressure, turn this screw upwardly.

TENSIONS

The needle and bobbin threads should be locked in the centre of the thickness of the material, thus:



Fig. 16. Perfect Stitch

If the tension on the needle thread is too light, or if that on the bobbin thread is too loose, the needle thread will lie straight along the upper surface of the material, thus:



Fig. 17. Tight Needle Thread Tension

If the tension on the bobbin thread is too tight, or if that on the needle thread is too loose, the bobbin thread will lie straight along the under side of the material, thus:



Fig. 18. Loose Needle Thread Tension

TO REGULATE THE TENSIONS

The tensions on the needle threads are regulated by the two thumb nuts **D**, Fig. 20 at the front of the tension discs on the front of the machine. To increase the tension, turn these thumb nuts over to the right. To decrease the tension, turn the thumb nuts over to the left.

The tensions on the bobbin threads are regulated by means of the screw nearest the centre of the tension spring on the outside of each bobbin case cap. To increase the tension, turn the screw which is nearest the centre of the tension spring on the outside of the bobbin case cap over to the right. To decrease the tension, turn the screw over to the left.

TO REGULATE THE LENGTH OF STITCH

The length of stitch is regulated by the thumb screw **A**, Fig. 19 at the right of the balance wheel.

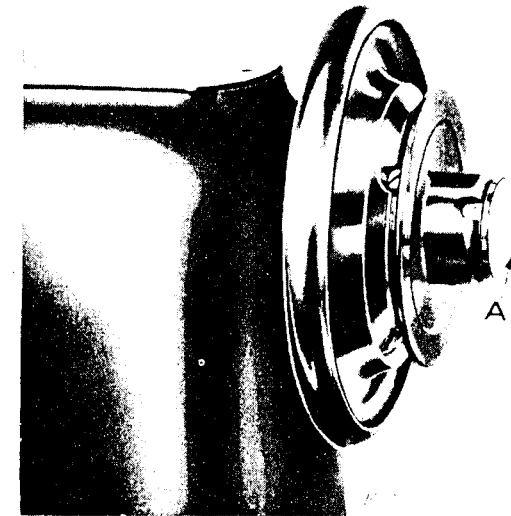


Fig. 19. Stitch Regulator

There is a notch in the hub of the balance wheel as shown in Fig. 19 and the number appearing in the notch shows the number of stitches to the inch that the machine is ready to make.

To lengthen the stitch, turn the thumb screw **A** over toward you. To shorten the stitch, turn the thumb screw over from you.

INSTRUCTIONS FOR ADJUSTERS AND MACHINISTS

THREAD CONTROLLER

The function of the thread controller spring is to hold back the slack of the needle threads until the eye of each needle nearly reaches the goods in its descent, as without this controlling action of the spring, the slack thread or silk (more especially silk) will sometimes be penetrated by the point of the needle as the needle is descending.

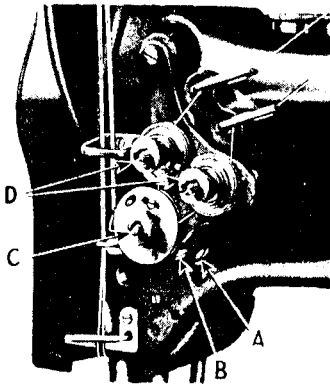


Fig. 20. Adjustment of Thread Controller

To change the thread controller stop for more controller action on the thread, loosen the set screw **B**, Fig. 20 and rotate the thread controller spring stop to the right; for less action, rotate to the left, after which securely tighten the set screw **B**.

It may be found advisable to increase the tension of the spring for coarse thread, or to lessen it for fine thread.

To increase the tension of the thread controller on the threads, loosen the tension stud set screw **A**, Fig. 20, located nearly under the tension stud, and turn the tension stud **C**, Fig. 20 slightly to the left with a screwdriver, or to decrease the tension, turn it to the right and retighten the stud set screw **A**.

TO SET THE NEEDLE BAR

See that the needles are up in the holder as far as they will go. There are two lines across the needle bar about two inches above the lower end. When the needle bar is at its lowest position, the upper mark should be just visible at the end of the needle bar frame.

In case the needle bar is not correctly set, loosen the needle bar connecting stud pinch screw **H**, Fig. 5 and place the needle bar in the correct position as directed above, then retighten the screw **H**.

On Machines 138W101 and 138W102, to set a needle bar which has no mark. Set the stitch regulator to indicate 8 stitches to the inch, then set the needle bar so that when it rises $\frac{3}{32}$ inch from its lowest position, the points of the sewing hooks will be at the centre of the needles and about $\frac{1}{16}$ inch above the eye.

On Machine 138W103, to set a needle bar which has no mark. Set the stitch regulator to indicate 8 stitches to the inch, then set the needle bar so that when it rises $\frac{1}{8}$ inch from its lowest position, the point of the sewing hooks will be at the centre of the needles and about $\frac{1}{16}$ inch above the eye.

RELATIVE POSITIONS OF NEEDLE BAR AND PRESSER BAR ON MACHINE 138W101

The distance between the needle bar and presser bar, after turning the stitch regulator so that there is no feed movement, should be $1\frac{17}{32}$ inch as shown in Fig. 5.

If the distance between the needle and presser bars is more or less than $1\frac{17}{32}$ inch, insert a screwdriver in the hole **A**, Fig. 2 at the front of the machine and loosen the screw therein. While this screw is loose, the needle bar frame can be moved forward or backward, as may be required, until the distance between the needle and presser bars is $1\frac{17}{32}$ inch. A piece of sheet metal $1\frac{17}{32}$ inch wide may be used to determine the correct distance. When making this adjustment be sure to see that the stitch regulator is set so that there is no feeding movement. When the adjustment has been made, securely tighten the screw **A**.

RELATIVE POSITIONS OF VIBRATING PRESSER BAR AND LIFTING PRESSER BAR ON MACHINES 138W102 AND 138W103

The distance between the vibrating presser bar and lifting presser bar, after turning the feed regulating spindle head **A**, Fig. 19 so that there is no feed movement of the needle bar, should be $\frac{17}{64}$ inch, as shown in Fig. 6.

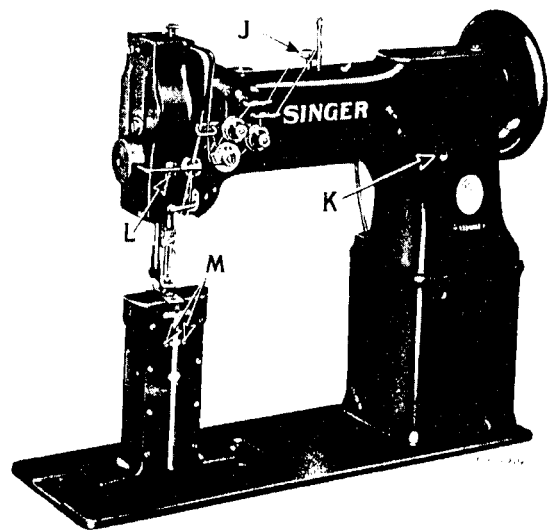


Fig. 21. Adjustments on Machines 138W102 and 138W103

If the distance between the vibrating presser bar and the lifting presser bar is more or less than $\frac{17}{64}$ inch, insert a screw driver in the hole **K**, Fig. 21 at the front of the machine and loosen the screw therein. While this screw is loose, the needle bar frame can be moved forward or backward, as may be required, until the distance between the vibrating presser bar and lifting presser bar is $\frac{17}{64}$ inch. A piece of metal $\frac{17}{64}$ inch wide may be used to determine the correct distance. When making this adjustment be sure to see that the feed regulating spindle head **A**, Fig. 19 is adjusted so that there is no feeding movement of the needle bar. When the adjustment has been made, securely tighten the screw at **K**, Fig. 21.

TO ADJUST THE RELATIVE HEIGHT OF LIFT OF THE VIBRATING AND LIFTING PRESSERS ON MACHINES 138W102 AND 138W103

The amount of lift of the vibrating and lifting presser feet should be regulated according to the thickness of the material being sewn. The feet should lift just high enough to clear the material. As a rule, the vibrating and lifting pressers should lift an equal height, but some grades of work may require that they lift an unequal height. To change the relative lift of the presser feet, loosen the screw **C**, Fig. 6 at the back of the machine, and move the presser bar upwardly or downwardly as required, then securely tighten the screw **C**.

TO TIME THE SEWING HOOKS

Set the feed regulator spindle head to indicate eight stitches to the inch.

Remove the throat plate and turn the balance wheel over toward you until the lower mark across the needle bar is just visible at the end of the needle bar frame on the upward stroke of the needle bar. If the needle bar and sewing hooks are correctly timed, the point of each hook will be at the centre of its needle and about $\frac{1}{16}$ inch above the eye.

In case the sewing hooks are not correctly timed, turn balance wheel over toward you until needle bar has descended to its lowest point and has risen until the lower timing mark across the needle bar is just visible at the end of the needle bar frame. Then loosen the four screws **D**, Fig. 22 in the hook shaft gears and turn the sewing hooks until the point of each hook is at the centre of its needle, after which securely tighten the four screws **D**, leaving just enough end play to the shaft for lubricating purposes.

TO SET THE SEWING HOOKS TO OR FROM THE NEEDLES

To prevent the points of the hooks from dividing the strands of the threads, they should run as close to the needles (within the scarf) as possible.

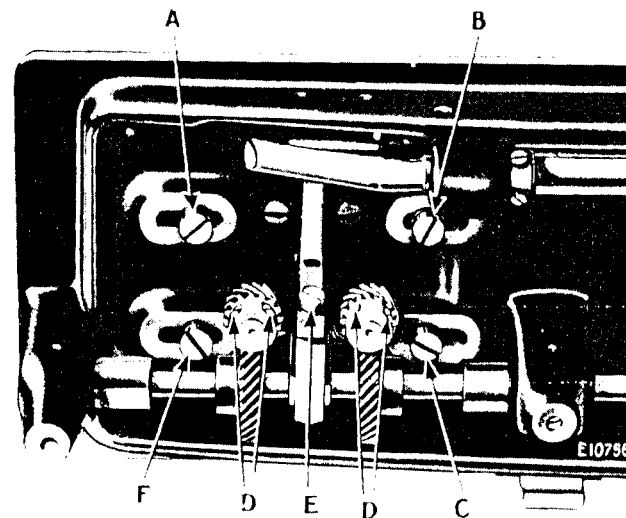


Fig. 22. Adjustment of Hook Saddles

Loosen the two screws **M**, Fig. 21 at the front of the hook posts covers. Turn the balance wheel over toward you until the points of the sewing hooks are at the centre of the needles. Loosen the four screws **A**, **B**, **C** and **F**, Fig. 22 underneath the bed of the machine and move the hook posts to the right or left, as may be required, until the points of the hooks are as close to the needles as possible without striking them, then securely tighten the four screws **A**, **B**, **C** and **F**, and the two screws **M**.

NEEDLE GUARDS

The function of the needle guard (which is attached to the bottom of each sewing hook) is to prevent the point of the hooks from striking the needles in case the needles are deflected toward the hooks.

The needle guards should be bent until they prevent the hooks from touching the needles; they should not, however, be bent outwardly enough to deflect the needles from their normal path.

TO REMOVE THE SEWING HOOKS FROM THE MACHINE

Remove the hook gib screws and remove the gib to allow the base of the bobbin case to be taken out, after which remove the screw, shown in

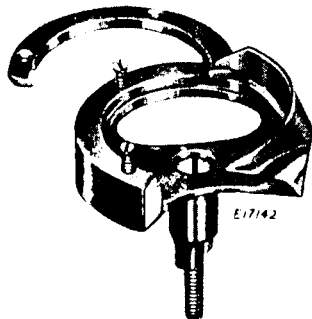


Fig. 23. Sewing Hook of Machine 138W101

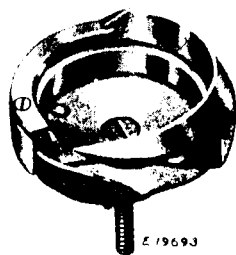


Fig. 24. Sewing Hook of Machines 138W102 and 138W103

Figs. 23 and 24 from the centre of the hook. Tapping the hook lightly on the bottom of its rim will force it from its socket. Do not try to pry it out, as prying may bend the shank of the hook. In replacing the hook, be sure that the pin on the underside properly enters the slot at the top of the socket, otherwise the hook will be out of time.

ADJUSTMENT OF FEED REGULATING SPINDLE HEAD

The figures on the feed regulating spindle head **DD**, Fig. 25, showing through the notch in the balance wheel, indicate the number of stitches to

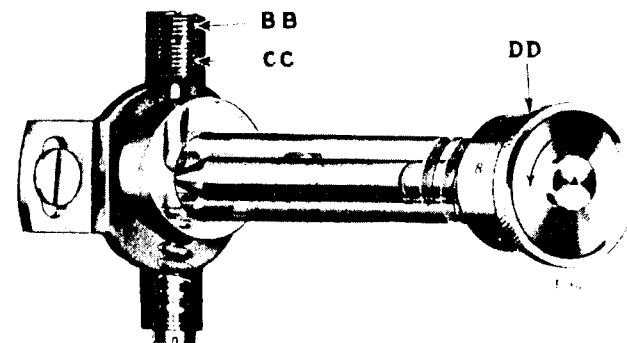


Fig. 25. "X-Ray" View of Feed Driving Eccentric Regulating Bracket and Shaft, showing the feed regulating spindle and adjusting screw (**CC**) which comes in contact with the cone of the spindle to gauge the length of stitch

the inch which should be made. If more or less stitches are made, adjust as follows: Remove screw **BB**, Fig. 25, set the indicator at **8** and the feed dog at its highest point, a full tooth showing above the throat plate, then adjust screw **CC**, Fig. 25 until eight stitches to the inch is the result and replace check screw **BB** firmly.

By making this adjustment with the stitch indicator set at **8** stitches, the full range of the stitch regulator is automatically taken care of so that the number appearing in the notch in the balance wheel will always indicate the correct number of stitches to the inch that the machine is ready to make.

To Set the Feed Regulator so that a Stitch Longer Than the One Desired Cannot be Made. Turn the spindle head **DD**, Fig. 25 as far as possible in the direction indicated by the arrow in Fig. 25; remove check screw **BB** and turn screw **CC** down until the machine makes the desired number of stitches to the inch, then turn screw **BB** down tightly on screw **CC** as a check. The stitches may then be changed by turning the stitch regulator **DD** for shorter stitches, but operators cannot make a longer stitch than that limited by the above adjustment.

TO RAISE OR LOWER THE FEED DOG

Usually when the feed dog is at its highest position, it should show a full tooth above the throat plate.

Remove the throat plate; clean the lint and dust from between the feed points and replace the throat plate; tip the machine back and turn the balance wheel towards you until the feed dog is at its highest position; loosen screw **E**, **Fig. 22** in the feed lifting cam fork and raise or lower the feed dog, as may be required, then tighten the screw **E**.

When raising or lowering the feed dog, be careful that its underside does not drop low enough to strike the sewing hooks.

The feed dog should be set so that when the needles are down they should be slightly in front of the centre (toward the operator) of the needle holes. In case the needles do not enter the holes in the feed dog correctly, loosen the pinch screw **D**, **Fig. 4** and adjust the feed dog as required, then securely tighten the pinch screw **D**.

TO REMOVE THE NEEDLE BAR ROCK FRAME ROCK SHAFT

Remove the face plate and needle bar rock frame, then loosen the clamp screw **A**, **Fig. 2** and draw out the rock shaft.

TO REMOVE THE ARM SHAFT CONNECTION BELT FROM WITHIN THE ARM

Slide the connection belt off lower pulley **E**, **Fig. 4**; remove the feed regulating spindle head and balance wheel; loosen the arm shaft bushing (back) screw **B**, **Fig. 3** at the back of the arm and remove the bushing; lift the belt up through the arm cap hole as far as possible and draw it out through the space normally occupied by the bushing.

Owing to the fact that the sewing hooks make two revolutions to one revolution of the arm shaft, and that the feed lifting eccentric is on the hook shaft, it is possible to have the sewing hooks correctly timed without having the feed eccentric correctly timed. To overcome this, the plate **G**, **Fig. 4** is attached to the underside of the bed of the machine. This plate is marked with an arrow at its lower end and directly alongside of the plate is the collar **F**, **Fig. 4** mounted on the hook shaft, which is also marked with an

arrow. When replacing the belt, replace the arm shaft bushing and securely fasten it in position by the screw **B**, **Fig. 3** at the back of the machine, replace the upper pulley, and then turn the balance wheel over toward you until the thread take-up lever is at its highest point. Then turn the hook shaft with the fingers until the two arrows, one on plate **G** and the other on collar **F**, are directly in line. Now, without disturbing either the arm shaft or the hook shaft, slip the belt over the lower pulley **E**, **Fig. 4**. The feed will then be correctly timed with the needle bar.

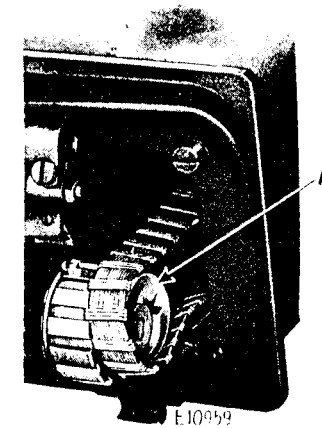


Fig. 26. Putting Belt on Lower Pulley with Belt Replacer 241538

To facilitate the replacing of the belt on the lower pulley, use belt replacer **No. 241538 A**, **Fig. 26**. Rest the replacer in the loop of the belt as shown in **Fig. 26** having the notches in the replacer engage the two set screws in the hub of the pulley. Turn the balance wheel toward you until the belt is fully over the pulley, then remove the replacer.

Note: As belt replacer **No. 241538** will serve for several machines, it is not regularly furnished with the machine, and must be ordered separately.

TO CHANGE THE GAUGE OF THE MACHINE

Change the needle holder, throat plate, feed dog and presser foot, then loosen the four screws **A**, **B**, **C** and **F**, **Fig. 22** which hold the hook posts and move each post until the point of the hook runs as close to the needle as possible without striking, then time the hooks as instructed on page **19**.

TO ADJUST THE MECHANICAL OPENER

Remove the cover plate at the front of the inside hook post, being careful not to injure the gasket.

The bobbin case lever **A**, Fig. 27 at the left of the inside sewing hook, actuated by the eccentric on the hook shaft, strikes the projection on the

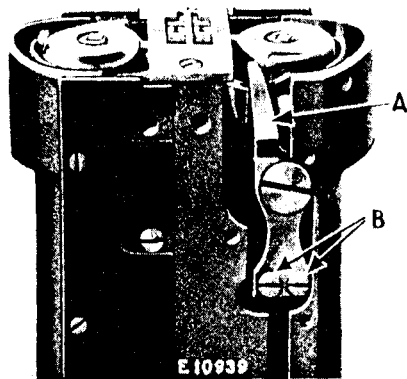


Fig. 27. Adjustment of Mechanical Opener

bobbin case and turns the bobbin case slightly, making an opening between the bobbin case stop and the stop on the throat plate when the thread is across the bobbin case and passing between the stops.

The bobbin case lever **A** may be adjusted by loosening the two bobbin case lever screws **B**, Fig. 27 and moving the bobbin case lever forward or backward.

This adjustment should be made so that the opening between the lever and the edge of the bobbin case is just perceptible when the bobbin case lever has opened the bobbin case all the way.

If the bobbin case lever is set to open the bobbin case too far, it will cause a bind between the bobbin case bearing and the hook bearing when the bobbin case is opened all the way, and care must be taken to see that this does not occur. After the correct adjustment is made, firmly tighten the two screws **B**, Fig. 27.

The above instructions also apply to the bobbin case lever for the outside sewing hook. This lever is accessible for adjustment after removing the cover plate at the rear of the outside hook post, being careful not to injure the gasket.

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