TO OUR VALUED CUSTOMER...

You are now the owner of a new zig zag sewing machine, the most versatile type of its kind you can possess.

Buttonholes, monogramming, overcasting and creative embroidery are done with ease and speed.

To aid you in obtaining the greatest performance from your new sewing machine, this book on its care and use has been written for you. Read the instructions carefully, as a thorough understanding of your machine will reward you with many hours of trouble-free creative sewing.

Also included in the front portion of this manual is a table of contents and glossary of terms to further aid you to enjoy your sewing machine.
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1. GLOSSARY OF SEWING TERMS

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<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLIQUE</td>
<td>Applying a material with a specific design onto another material by using a straight or zig zag stitch.</td>
</tr>
<tr>
<td>BASTING</td>
<td>To sew with a temporary stitch that can be removed with ease. This is possible by using the longest straight stitch, setting your top tension on “0” and sewing a line of stitches. The top stitch will be loose and the bottom stitch tight; this allows you to be able to remove the lower thread by pulling. It may be necessary to cut the lower thread at different points for easier removal.</td>
</tr>
<tr>
<td>BLIND HEM</td>
<td>A variation of the zigzag stitch used to finish a hem where you can control the holding stitch.</td>
</tr>
<tr>
<td>BUTTONHOLE</td>
<td>A means of strengthening the sides of a hole in cloth by a zigzag stitch to hold a button.</td>
</tr>
<tr>
<td>COUCHING</td>
<td>To fasten down another material, like a ribbon lace, with a fine zig zag stitch.</td>
</tr>
<tr>
<td>DARNING</td>
<td>A method of repairing a rip or tear by stitching over the flaw.</td>
</tr>
<tr>
<td>EMBROIDERY</td>
<td>To decorate with stitching, using either a straight or zigzag stitch.</td>
</tr>
<tr>
<td>FACING</td>
<td>The addition of another piece of material to increase the body or edge of material.</td>
</tr>
<tr>
<td>GATHERING</td>
<td>Forming a zigzag stitch over cord, elastic, or any separate material. Another term for shirring.</td>
</tr>
<tr>
<td>HEM</td>
<td>A fold, sewn down an edge of cloth.</td>
</tr>
<tr>
<td>MONOGRAMMING</td>
<td>Using a straight stitch for tracery or zigzag stitching to form a design.</td>
</tr>
<tr>
<td>OVERCASTING</td>
<td>The use of a zigzag stitch to finish a seam or edge of cloth, or to prevent the raveling of a loose weave cloth.</td>
</tr>
<tr>
<td>OVERLOCK</td>
<td>A triple stretch pattern used to finish seams or stretch buttonholes.</td>
</tr>
<tr>
<td>PATCHING</td>
<td>Same as darning but covering the hole with a piece of cloth.</td>
</tr>
<tr>
<td>PICOT STITCH</td>
<td>A triple stretch pattern used similar to a tricot stretch giving a hand stitch effect.</td>
</tr>
<tr>
<td>QUILTING</td>
<td>Joining several cloths together to form a bulk cover for beds, furniture or clothing.</td>
</tr>
<tr>
<td>RICK RACK</td>
<td>A triple stretch pattern using a basic zigzag to give a RICK RACK effect.</td>
</tr>
<tr>
<td>SATIN STITCH</td>
<td>A solid line of zigzag stitching formed by zigzag stitch sewn very close together.</td>
</tr>
<tr>
<td>SEAM</td>
<td>A line formed when sewing two pieces of material together.</td>
</tr>
<tr>
<td>SHELL TUCK</td>
<td>The use of the zigzag or variation of the zigzag stitch to give a shell effect to the edge of material.</td>
</tr>
<tr>
<td>SHIRRING</td>
<td>To gather cloth by drawing two or more threads together.</td>
</tr>
<tr>
<td>STRAIGHT STITCH</td>
<td>A forward or reverse single line of sewing which may vary from 6 to 8 stitches per inch to “O” stitches.</td>
</tr>
<tr>
<td>STRETCH BUTTONHOLE</td>
<td>A buttonhole made with a stretch stitch pattern to be used on double knits, sweaters, etc.</td>
</tr>
<tr>
<td>STRETCH STITCH</td>
<td>A combination of stitches formed by a forward and backward motion which allows the stitches to flex and not break, used on stretch materials, double knits, tricot, lingerie, etc.</td>
</tr>
<tr>
<td>TACKING</td>
<td>A series of stitches to lock thread.</td>
</tr>
<tr>
<td>TAPERING</td>
<td>A line of zigzag sewing varying from a narrow to a wide range.</td>
</tr>
<tr>
<td>THREAD SHANK</td>
<td>A space composed of thread between the button and cloth to engage button to buttonhole on bulky material.</td>
</tr>
<tr>
<td>TOPSTITCHING</td>
<td>A line or series of lines of straight or zig zag sewing which enhances a border giving the stitching a raised effect.</td>
</tr>
<tr>
<td>TRICOT STITCH</td>
<td>A triple stretch pattern used to finish delicate fabrics or lace.</td>
</tr>
<tr>
<td>TRIPLE STRETCH</td>
<td>A term used for stretch patterns, a pattern formed by a forward, sideward and backward combination of stitches.</td>
</tr>
<tr>
<td>ULTRA STRETCH</td>
<td>A triple stretch pattern which is excellent to make seams in bulk materials like sweater and swimwear.</td>
</tr>
<tr>
<td>UNDER STITCHING</td>
<td>Using a variation of the zigzag stitch to finish a hem or seam that is hidden.</td>
</tr>
<tr>
<td>VARIEGATED THREAD</td>
<td>A single strand of thread with varying colors, used for a decorative effect.</td>
</tr>
<tr>
<td>ZIG ZAG</td>
<td>A term which describes the side to side motion of the needle which creates width to straight sewing.</td>
</tr>
</tbody>
</table>
# 2. GLOSSARY OF SEWING MACHINE FEATURES

<table>
<thead>
<tr>
<th>ACCESSORY</th>
<th>For storage of extra feet, needles, bobbins and accessories. Also used as extension of arm for a larger work surface.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOX/TRAY</td>
<td>Balances upper and lower tension threads.</td>
</tr>
<tr>
<td>LOWER TENSION SPRING</td>
<td></td>
</tr>
<tr>
<td>BOBBIN TENSION SCREW</td>
<td>To adjust the tension of bobbin case.</td>
</tr>
<tr>
<td>BOBBIN WINDING SPINDLE</td>
<td>For winding bobbin with thread.</td>
</tr>
<tr>
<td>BOBBIN WINDING STOP</td>
<td>For automatically stopping bobbin at full capacity.</td>
</tr>
<tr>
<td>CABINET</td>
<td>Used to mount sewing machine in furniture; also a storage area for machine.</td>
</tr>
<tr>
<td>DROP FEED LEVER</td>
<td>For lowering the feed dog.</td>
</tr>
<tr>
<td>FACE COVER</td>
<td>Snaps open for changing the bulb and adjusting foot pressure. Also provides easy access to needles and presser bar assembly for oiling.</td>
</tr>
<tr>
<td>FEED DOG</td>
<td>For feeding material through machine.</td>
</tr>
<tr>
<td>FOOT CONTROL</td>
<td>For activating power to the machine, amount of pressure exerted on the foot pedal controls the speed; attached wires plug into machine and wall socket.</td>
</tr>
<tr>
<td>HANDWHEEL</td>
<td>For turning mechanism by hand to bring needle and take up to high position. This wheel turns toward operator.</td>
</tr>
<tr>
<td>LIGHT/MOTOR SWITCH</td>
<td></td>
</tr>
<tr>
<td>NEEDLES</td>
<td>Used to form a lock stitch on your machine, variations are many; example: sharp, ball, leather, etc.</td>
</tr>
<tr>
<td>NEEDLE CLAMP</td>
<td>For attaching the needle to the lower end of the needle bar.</td>
</tr>
<tr>
<td>NEEDLE CLAMP THUMB SCREW</td>
<td>For fastening needle into needle clamp.</td>
</tr>
<tr>
<td>NEEDLE PLATE</td>
<td>For supporting material when sewing. This plate is marked for several hem sizes.</td>
</tr>
<tr>
<td>PORTABLE COVER</td>
<td>A receptacle to protect a sewing machine when not in use.</td>
</tr>
<tr>
<td>PRESSER BAR</td>
<td>Controls the pressure exerted on various materials being sewn. Can be varied by control lever.</td>
</tr>
<tr>
<td>PRESSER FOOT LIFTER</td>
<td>When lowered onto material it holds the material against the feed dog.</td>
</tr>
<tr>
<td>PRESSER FOOT</td>
<td>For raising or lowering the presser bar and presser foot. When raised, the tension is released and when lowered, the tension is engaged.</td>
</tr>
<tr>
<td>PRESSER FOOT LIFTER</td>
<td>For fastening presser foot and attachments to the presser bar.</td>
</tr>
<tr>
<td>REVERSE</td>
<td>For changing from forward to reverse direction, button must be held in for continued reverse sewing.</td>
</tr>
<tr>
<td>SEWING BUTTON</td>
<td>Located under the face cover to change the light bulb.</td>
</tr>
<tr>
<td>SOCKET</td>
<td>One for sewing and for winding bobbin.</td>
</tr>
<tr>
<td>SPOOL PIN</td>
<td>For twin needle sewing and zigzag sewing.</td>
</tr>
<tr>
<td>(RETRACTABLE)</td>
<td>For changing the length of stitch in either forward and reverse direction.</td>
</tr>
<tr>
<td>SPOOL PIN</td>
<td>For drawing up the top thread to form a tight stitch.</td>
</tr>
<tr>
<td>(EXTRA)</td>
<td>For cutting excess thread, located on the back and into the presser bar.</td>
</tr>
<tr>
<td>STITCH LENGTH DIAL</td>
<td>Holds thread taut for even winding.</td>
</tr>
<tr>
<td>THREAD CUTTER</td>
<td>Guides thread from spool pins to the tension.</td>
</tr>
<tr>
<td>THREAD GUIDE FOR BOBBIN WINDING</td>
<td></td>
</tr>
<tr>
<td>THREAD GUIDE FOR UPPER THREADING</td>
<td>Two needles with one shank making it possible to sew with two top threads.</td>
</tr>
<tr>
<td>TWIN NEEDLES</td>
<td>Use for single or two thread sewing, helps control thread lock.</td>
</tr>
<tr>
<td>UPPER THREAD TENSION</td>
<td>Used to change upper tension numbered from &quot;0&quot; to &quot;9.&quot;</td>
</tr>
<tr>
<td>UPPER THREAD TENSION DIAL</td>
<td>For setting width of zigzag stitching. Zigzag width may be varied from 0 width to 7 mm width.</td>
</tr>
<tr>
<td>ZIGZAG WIDTH DIAL</td>
<td>Special features:</td>
</tr>
<tr>
<td>There is no bobbin case. The bobbin is placed in the rotary hook.</td>
<td></td>
</tr>
<tr>
<td>Zigzag width is controlled by a dial which allows a full 7 mm width.</td>
<td></td>
</tr>
<tr>
<td>Automatic declutching device for winding the bobbin, simply place a bobbin on spindle and move to the right, machine automatically is disengaged and needle will not move up and down.</td>
<td></td>
</tr>
<tr>
<td>All presser feet are letter coded to correspond with correct stitches. Dial has a special window under stitch selection which identifies foot which should be used.</td>
<td></td>
</tr>
</tbody>
</table>
3. NAME AND FUNCTION OF PARTS

1. Top Thread Guide
   - To lead Upper Thread.

2. Upper Thread Tension Dial
   - To adjust upper thread tension according to kind of material and thread used. The higher the number on tension dial, the greater the tension.

3. Thread Guide and Check Spring
   - To lead upper thread from left to right, under check spring.

4. Take-Up Lever
   - Safety-designed take-up lever for easier threading. Threaded from left to right.

5. Presser Foot Pressure Control Lever
   - To change pressure of presser foot.

6. Needle-bar Thread Guide
   - To lead upper thread into the left guide for regular sewing. Right guide for twin needle sewing.

7. Needle Clamp Screw
   - For needle replacement.

8. Snap-on Presser Foot
   - Easily changeable foot for feeding materials.

9. Feed Dog
   - To feed materials.

10. Needle Plate
    - For smooth feeding to aid sewing.

11. Plastic Plate
    - So you can see the quantity of lower thread on the bobbin.

12. Drop Feed Lever
    - To lower feed dog for darning and embroidering, etc.

13. Spool Pin (Retractable)
    - To mount spool of thread.
    - Retracts when not in use, by pressing Pin.

14. Bobbin Winder Spindle
    - To wind thread on bobbin.

15. Handwheel
    - Always turn it towards you, used to lower or raise needle.

16. Pattern Selector
    - To select the stitch pattern and correct presser foot.

17. Zigzag Width Dial
    - To adjust Zigzag width, from “0” width to 7 mm width.

18. Stitch Length Dial
    - To adjust stitch length.

19. Reverse Button
    - To be pushed for reverse sewing.

20. Presser Foot Lifter
    - To raise foot. With 2-step lifter thicker fabric can be easily fed.

21. Power and Light Switch
    - To set machine on and to turn on sewing light at the same time.

22. Electrical Receptacle for Foot Controller
    - To plug in foot controller and obtain power supply.

23. Extension Table with Accessory Box
    - To convert the machine style into flat-beuse. To store the accessories.
4. ACCESSORIES

The following accessories come with your machine as standard equipment and can be easily and neatly stored in accessory box.

1. Bobbins ............... 3 pcs.
   NO. 14 ...... 1pc.
   NO. 11 ...... 1pc.
   NO. 9 ...... 1pc.
3. Ball-point Needle
   NO. 11 ...... 1pc.

For stretch fabrics such as knits, jersey materials, etc., use Ball-point Needle to get better stitch performance.

4. Twin Needle ...... 1pc.
5. General Purpose Foot (A)
   (attached to machine)
6. Straight Stitch Foot (B)
7. Cording Foot (C)
8. Roll Hemming Foot (D)
9. Overcasting Foot (E)
10. Zipper Foot (F)
11. Elastic Stitch Foot (G)
   (For stretch fabrics such as jersey, double knit, etc.)
12. Blind Stitch Foot (H)
13. Button-hole Foot (I)
14. Darning Foot
15. Cloth Guide
16. Quilting Guide
17. Button-hole Cutter
18. Oil
19. Screwdrivers
   Small .................. 1pc.
   Large .................. 1pc.
20. Cleaning Brush with Bobbin Extractor
21. Extra Spool-pin
   (For twin needle sewing and zigzag sewing)
22. Spool Caps
   Small .................. 1pc.
   Large .................. 1pc.
23. Bulb
5. CONNECTING FOOT CONTROLLER AND POWER CORD

Connect foot controller and power cord. ①②

Before plugging in, be sure voltage of machine conforms to your electrical power supply.

Switch on machine.

Always unplug machine when not in use.

Be careful not to drop foot controller.

6. CHANGING NEEDLE

(1) Bring needle to highest position by turning handwheel towards you.

(2) Take out needle to be changed.

(3) With flat side away from you, insert new needle as far as it will go.

(4) Tighten needle clamp screw.
Do not use bent or blunt needles.

7. CHANGING FOOT

Raise presser foot lifter. Bring needle to highest position.

Snap-on presser foot

(1) Push button of holder towards you and foot will come off.
(2) Center new foot under shank.
(3) Lower presser foot lifter so that shank fits over presser foot pin.

If shank does not fit perfectly, press button again.

Darning Presser Foot

(1) Remove foot and holder by loosening screw with small screwdriver.
(2) Align hole of darning foot with hole of needle plate.
(3) Lower needle by turning handwheel towards you.
(4) Lever of foot should be behind needle clamp screw.
8. UPPER THREADING

Raise presser foot.

Raise take-up lever to the highest position by turning the handwheel toward you.

Thread by following steps:

1. Lead thread from spool, hook it into guide 1 and pass it between guide 1 and guide 2. It may be necessary to place a little pressure on the spool with your index finger to keep thread tight when threading.

2. Draw thread to the front and into either tension disc of thread tension unit 3. Tension unit is divided in center by a larger flat disc.

3. Bring the thread down and onto guide 4 and pull it up. This will automatically engage thread with spring.

4. Hook thread onto the take-up lever 5 making sure it is through the hole from left to right.

5. Pull thread down to lower thread guide 6 at the bottom of the face, and pull it to the left to engage.

6. Pull the thread toward needle clamp guide, left side, and place thread behind guide 7.

Now thread the needle from front to back. If you have difficulty threading, cut thread at an angle with scissors. Leave about six inches of thread.
9. LOWER THREADING

Removing the Bobbin

Slide the plastic plate towards you and remove the bobbin with your finger, as shown, or you may use the opposite end of your lint cleaning brush to extract the bobbin.

10. INSERTING BOBBIN

(1) Insert the bobbin into the shuttle with the thread end in direction of the arrow. Bobbin should rotate clockwise.

(2) Grasp thread, pass the thread around the front, from right to left and through the slot A.

(3) Change direction and continue pulling the thread from left to right across the front 34 until it engages into slot B. 35

(4) Pull the thread towards the needle for about six (6) inches, release the thread and close the plastic plate.
11. DRAWING UP THE LOWER THREAD

Hold the end of the upper thread with your left hand, keep it slightly slack as shown and turn the handwheel towards you slowly.

The needle should make one revolution, all the way down and return to the UP position. Simultaneously, a slight pressure should be placed on the upper thread when the needle is raising which should pull the lower thread in a loop visible above the needle plate.

*Do not pull the upper thread too hard, as this may bend the needle.*

Grasp both threads, upper and lower, place under the presser foot towards the left as shown. Place fabric under the presser foot and you are ready to sew.
12. WINDING BOBBIN

(1) Pull up the spool pin.
(2) Place spool on spool pin. Draw thread from the spool through the thread guides A and B.

(3) Wind the thread clockwise around the bobbin several times.

(4) Push the bobbin onto winder spindle as far down as it will go.

(5) Push the bobbin to the right toward handwheel.

(6) It is not necessary to touch the handwheel. Your machine will automatically declutch. The needle will not go up or down.

(7) Press down foot controller and your bobbin will fill with thread.

Do not put your fingers near the needle as it is possible for the needle to move a little when starting to wind the bobbin.

Never push the spindle towards the handwheel while sewing.

(8) Machine will stop automatically when bobbin is full.

(9) Remove full bobbin and push the spindle to the left, away from the wheel. The machine will automatically engage and be ready for normal sewing.
13. FUNCTIONS OF CONTROLS AND DIALS

(Be sure needle is in UP position when you set controls)

A. Pattern Selector Dial A
This dial is used to choose patterns and the proper presser foot recommended for this stitch. Dial can be turned either to right or to the left. Various stitches may be selected, twelve in total plus a built in buttonhole.

B. Zigzag Width Dial B
Your machine may be set at varying zigzag widths. "0" setting will give you straight sewing and "7" will give you a 7 mm width. You can set your dial for any width you may choose, larger the number, wider the width.

C. Stitch Length Dial C
Your stitch length may be set from "0", sewing in one spot to "4", about 6 to 8 stitches per inch. As a general rule, the heavier the material, the longer the stitch. For lighter material use a shorter stitch.

D. Reverse Sewing Button D
Used for reverse stitching or tacking. Keeping the button pressed in will allow you to sew a reverse stitch continuously. It is not advisable to push this button when doing stretch stitches.

Tacking Tack
Tacking is a technique used to secure threads and prevent them from unravelling by a series of stitches in one spot. You may wish to tack at the end of a buttonhole or after completing a monogram. Simply dial the tacking stitch and perform several stitches. It is not necessary to make any other adjustments to the width or length dials.

Color Coding of Dials
Your dials are color coded to give you better performance of your stitches:

<table>
<thead>
<tr>
<th>Color</th>
<th>Stitch Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>Blind Hem Stitches</td>
</tr>
<tr>
<td>BLUE</td>
<td>Multiple Zigzag &amp; Serpentine</td>
</tr>
<tr>
<td>YELLOW</td>
<td>Stretch Utility</td>
</tr>
<tr>
<td>PURPLE</td>
<td>Straight Stretch</td>
</tr>
<tr>
<td>ORANGE</td>
<td>Buttonhole</td>
</tr>
</tbody>
</table>
E. DROP FEED LEVER E
This lever is located on the bottom of the free arm. When lever is moved to the left, the feed dogs will automatically drop below the level of the needle plate, making it possible to sew on buttons, darning, monogram, etc. Moving lever to the right will automatically raise the feed dog for normal sewing.

Left Right

F. foot pressure regulator F
The pressure of the foot can be adjusted for different cloth thicknesses. This lever adjustment is located inside the face cover, move the face to the left and the lever will be in view as per sketch.

2........ normal sewing
1........ elastic materials, thick fabrics, etc.
0........ for darning, monogramming

G. Double Presser Foot Lifter G
Presser foot can be lifted up one more step to obtain a wide gap for thick materials, jeans blankets, quilts, etc.

H. Tension Dial H
Tension dial is numbered from "0" to "9". Dial settings of "4 5 6" are marked in blocks, as these are used for normal sewing. Tension may be adjusted for near "0" for basting and increased to "9" for rolled hems, shell tucks, etc.
14. THREAD TENSION ADJUSTMENT

In most cases a suitable tension can be obtained easily with only an adjustment of the upper thread tension dial.

Normal tension sewing will be in the range of 4-5-6, marked in white blocks.

Decreasing Tension:
Turn thread tension dial towards “0” - this is normal for basting.

Increasing Tension:
Turn thread tension dial towards “9” - this is used for rolled hem, shell tuck, etc.

Lower Tension

Correct Tension:
Pull end of lower thread backwards away from plastic plate. You should feel a slight steady pressure.

Adjustment:
Note sketch showing correct tensions. With clear plastic plate closed, insert small screwdriver into front hole C and locate adjusting screw. Turn adjusting screw clockwise A if lower thread is too loose and counterclockwise B if lower thread is too tight.
15. USING THE EXTENSION PLA

To Attach and Remove the Extension Plate:

To detach the accessory/extens box combination, just push plate the back as shown in figure 2. Pl will pivot on a stationary pin, lift plate to remove. You may choose leave the extension plate in place the pin, as in figure 3, or place front of you as in figure 4.

To attach the accessory/extens box combination, reverse the proce fitting the box on the pin and pi the box forward to meet the op arm portion. A metal clip will hold box firmly in place.
16. FREE ARM FEATURES

For sewing tubular and hard-to-reach areas, use your machine as a free-arm. Stitching button-holes or sewing buttons on a cuff or neckband; topstitching a sleeve; edge finishes on sleeves, pantlegs and waistlines; darning and patching knees, elbows; and other areas of wear on children’s clothing become as easy as sewing a common seam when you have the free-arm at your fingertips. Illustrations show some examples of sewing with the free-arm.
## 17. PATTERN SETTING

<table>
<thead>
<tr>
<th>TWIN NEEDLE</th>
<th>PATTERN NAME</th>
<th>COLOR CODE</th>
<th>ZIGZAG WIDTH</th>
<th>STITCH LENGTH</th>
<th>PRESSE FOOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram]</td>
<td>BUTTON-HOLE</td>
<td>ORANGE</td>
<td>3.5 ~ 6</td>
<td>0.4 ~ 1</td>
<td>1</td>
</tr>
<tr>
<td>[Diagram]</td>
<td>TACKING</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>[Diagram]</td>
<td>STRAIGHT</td>
<td>—</td>
<td>0</td>
<td>1.5 ~ 4</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>ZIG ZAG</td>
<td>—</td>
<td>1 ~ 7</td>
<td>0.3 ~ 4</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>BLIND HEM</td>
<td>GREEN</td>
<td>1.5 ~ 4</td>
<td>1 ~ 2</td>
<td>H</td>
</tr>
<tr>
<td>3</td>
<td>STRETCH BLIND HEM</td>
<td>GREEN</td>
<td>1.5 ~ 4</td>
<td>1 ~ 2</td>
<td>H</td>
</tr>
<tr>
<td>4</td>
<td>SERPENTINE</td>
<td>BLUE</td>
<td>3.5 ~ 7</td>
<td>0.5 ~ 1</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>MULTIPLE ZIG ZAG</td>
<td>BLUE</td>
<td>3.5 ~ 7</td>
<td>0.5 ~ 1</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>SMOCKING</td>
<td>YELLOW</td>
<td>3.5 ~ 7</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>ULTRA STRETCH</td>
<td>YELLOW</td>
<td>3.5 ~ 7</td>
<td>4</td>
<td>E</td>
</tr>
<tr>
<td>8</td>
<td>RICK RACK</td>
<td>YELLOW</td>
<td>3.5 ~ 7</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>9</td>
<td>OVERLOCK</td>
<td>YELLOW</td>
<td>3.5 ~ 7</td>
<td>4</td>
<td>E</td>
</tr>
<tr>
<td>10</td>
<td>DOUBLE OVERLOCK</td>
<td>YELLOW</td>
<td>3.5 ~ 7</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>11</td>
<td>STRAIGHT STRETCH</td>
<td>PURPLE</td>
<td>0</td>
<td>4</td>
<td>A</td>
</tr>
</tbody>
</table>
### 18. FABRIC, THREAD AND NEEDLE CHART

<table>
<thead>
<tr>
<th>FABRIC</th>
<th>NEEDLE (Long Scarf)</th>
<th>THREAD</th>
<th>STITCH LENGTH SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELICATE—tulle, chiffon, voile, fine lace, organdy, lawn, crepe, taffeta</td>
<td>9 70</td>
<td>Fine mercerized 60 European 50–70 “A” Silk Fine Synthetics</td>
<td>1-1/4—1-3/4</td>
</tr>
<tr>
<td>KNITS—sheer tricot</td>
<td>light ball point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIGHTWEIGHT—batiste, organdy, voile, taffeta, silk, crepe, chiffon, velvet</td>
<td>11 75</td>
<td>Fine mercerized 60 European 50–70 Fine Synthetics “A” Silk</td>
<td>1-3/4—2</td>
</tr>
<tr>
<td>KNITS—tricot, brushed tricot, jerseys, synthetic leathers, power net</td>
<td>light ball point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHERS—plastic film, vinyls</td>
<td>Wedge point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDIUM WEIGHT—gingham, percale, linen, chintz, faille, satin, corduroy, velvet, suitings, wools, pique, terry</td>
<td>14 90</td>
<td>Mercerized 50 European 30 “A” Silk Synthetic</td>
<td>1-3/4—2</td>
</tr>
<tr>
<td>KNITS—jersey, double knit power net, bathing suits</td>
<td>light or medium ball point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHERS—vinyls, plastic film</td>
<td>Wedge point</td>
<td></td>
<td>2-1/2—3</td>
</tr>
<tr>
<td>MEDIUM HEAVY—gabardine, tweed sailcloth, denim, duck, coatings, wools, drapery</td>
<td>16 100</td>
<td>Mercerized 50 Heavy Duty Mercerized European 30 “A” Silk Synthetic</td>
<td>2—2-1/2</td>
</tr>
<tr>
<td>KNITS—double knit, power net</td>
<td>heavy ball point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHER—vinyl, rubber backed drapery fabric</td>
<td>Wedge Point</td>
<td></td>
<td>2-1/2—3</td>
</tr>
<tr>
<td>HEAVY—overcoatings, canvas, upholstery, awning</td>
<td>18 110</td>
<td>Heavy Duty Mercerized European 30 Synthetic</td>
<td>2-1/2—4</td>
</tr>
<tr>
<td>KNITS—fake furs, velours, sweater</td>
<td>heavy ball point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHERS—vinyls, plastics</td>
<td>Wedge point</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use elastic stitch foot (G) in order to get better stitch performance for a stitch fabrics such as jersey, double knit, etc.

![Needle Types Diagram]
19. APPLICATIONS OF THE STRAIGHT STITCH

A. Seams

The normal stitch length for most fabrics is 3, but the length chosen should depend on the fabric and area of usage. Usually, heavier fabrics require longer stitches, and lighter weight fabrics require shorter stitches. For curved seams and bias cut areas use a shorter stitch length to add strength and elasticity to the seam.

B. Basting/Topstitching

Sewing a seam with a longer stitch is useful for temporary seams prior to fitting. Basting stitches also may be used when gathering in fullness. Topstitching can be done very effectively with the long straight stitch. For a bolder stitch, two threads of the same type can be threaded through one needle (size 14 or 16). A heavier thread such as buttonhole twist may be used for topstitching, but be sure to use a larger needle (size 16 or 18). Basting instructions in glossary.
C. Darning
Worn spots or small holes can be darned very easily. Use of an embroidery hoop is optional depending on the fabric. A fine thread is recommended so that the fabric and thread will blend together invisibly. Trim the ragged edges from the area to be darned. Hold the threads to start, then move the fabric slowly back and forth while running the machine very fast to fill the area. More professional results will be attained by moving the fabric in a figure eight pattern while sewing. After filling in the area lengthwise, reweave with crosswise stitches in the same manner.

D. Elastic Thread Shirring
Wind elastic thread onto bobbin. The thread should be wound smoothly without stretching. Place bobbin in case as usual, being sure that the elastic is drawn through the tension. Use regular thread on the top of the machine. Do a trial run on the chosen fabric to test length of stitch. Lay a piece of paper under the fabric to keep it from gathering up as you sew. This will enable you to sew many parallel rows of stitching without difficulty. Afterwards tear paper away and the fabric will be gathered.

E. Holding The Fabric
For most fabrics, it is not necessary to hold the fabric in both front and back. Merely guide the fabric with one hand from the front. For the fine delicate fabrics, such as chiffon, georgette, and tricot, the best results will be attained by holding the fabric in front and back of the needle without pulling on it.
F. Turning Corners
To pivot at a corner, leave the needle in the fabric while on the upswing so that the stitch is almost completed, thus preventing the possibility of skipped stitches in the corner. Lift the presser foot and pivot the fabric. Then, lower the presser foot and continue sewing.

G. Curved Seams
On a curved seam use a slightly shorter stitch length than you are using for the rest of the seam. For example, if length 2 to be used for the seams, a 1 1/2 stitch length would be preferred for curves. A smaller stitch length will add strength and elasticity to the seam. When guiding the fabric, keep your fabric edge on the guide lines that are clearly marked on your needle plate.

H. Ending Seam/Removal of Fabric
Stitch to the edge of the fabric then press the reverse stitch button and backstitch for a few stitches to reinforce the end of the seam. Turn the hand wheel until the take-up lever is in its highest position so that the stitch is completed and the threads will pull freely. Lift the presser foot and remove the fabric by drawing the threads to the left and back keeping them under the foot as not to bend the needle. Cut the threads with the thread cutter on the back of the presser bar. Leave the thread ends 6 inch long.
20. ZIGZAG SEWING

Thread-Tension for Zigzag Stitching
Better-looking zigzag stitching requires less upper tension than straight stitching. Loosen upper tension slightly.

Use extra spool-pin for neater stitches on reverse sides.

(1) Push extra spool-pin, as far as in will go, into square hole of top right of machine.

(2) Please refer to upper threading on page 9.
21. APPLICATIONS OF THE ZIG-ZAG STITCH

A. Overcasting
Place the edge of the material underneath the opening of the sewing foot and guide raw edge along the center groove of the foot, allowing stitch to form half on and half off the fabric. The multiple stitch zigzag is a wiser choice for most fabrics.

B. Seaming Knits
The narrow zigzag can be used in seams of firm knits for added strength. After sewing, open seam and press flat. Tiny zigzag stitches can hardly be seen and the seam will give when stretched.
C. Satin Stitching
This is useful for decoration such as tapering, manual designed embroidery, monogramming, and applique.
The satin stitch, which is a very close zigzag stitch, is obtained by setting the stitch length as near to “0” as possible without stopping the feeding action. The setting will vary for different fabrics. It may be desirable to loosen the upper tension slightly to cause the threads to lock underneath, in order to make the top surface look especially smooth. For lightweight fabrics, place paper underneath the fabric while sewing for best results.

D. Tapering/Creative Embroidery
Tapering is done by gradually increasing and decreasing the stitch width while sewing. By this method, tapered monograms and other interesting designs can be created. For tapered monograms run the machine fast while turning the width dial slowly from narrow to wide and back.
E. Manual Embroidery Designs
Different designs can be made by turning the stitch width dial between 0 and 7. By running the machine at a constant speed and turning the dial in a definite rhythm, various designs can be created.

F. Gathering Over Cord
Ordinary gathering with a basting stitch often breaks while pulling in fullness. A small zigzag across a cord such as crochet thread or carpet thread, gives a much stronger cord for gathering fullness into fabrics. Once the gathers have been stitched in place, the cord can be pulled out in order to eliminate bulk.
G. Free Hand Monogramming
For giving garments and linens a personalized touch, first transfer the design to the right side of the fabric. An embroidery hoop is recommended especially for soft fabrics and toweling. In order to monogram, you must move the fabric slowly and run the machine rapidly. Monogramming is like writing by moving the paper under a stationary pen. Guide the fabric slowly so that the zigzag falls close together like a satin stitch, but be careful that the stitches do not pile up. When guiding from side to side, move fabric slightly faster to avoid a heavy area. Practice by forming loops. Once this is accomplished any letter is easy. Sometimes the use of paper or non-woven interfacing under the fabric may make guiding the fabric easier. The paper or interfacing may be torn or cut away at the completion of the monogram. When monogramming towels, cellophane placed on the top will help cover loops and make the monogram smooth. Pull or cut away remaining cellophane when finished.

H. Applique
Applying decorative shapes of fabric scraps to household articles and clothing is a very interesting way of trimming an otherwise plain article. First, trace the design on fabric to be appliqued, then pin or baste it securely in place on garment. With a small straight stitch or narrow zigzag, sew around the transferred design. After excess fabric is trimmed away, sew around the applique with a satin stitch. For a smooth curve, stop frequently at the inside edge of the curve to pivot the fabric slightly. Corners look much better when the point is stitched by pivoting rather than just turned. As with all decorative stitches, paper may be used to give more body to the fabric when stitching and can be torn away when the applique is completed.
22. ROLL HEMMING

A. With Straight Stitch

Raise presser foot lifter. Sew straight stitches at 0.5cm (1/5"") from edge.

Draw out work and leave about 10cm (4"") of thread.

Place material under presser foot. Guide edge into the scroll. Pull four thread ends (A and B) towards back, and lower foot. Sew a few stitches pulling thread ends by left hand. Keep guiding material holding raw edge about 0.6cm (1/4"") in front of foot.

B. With Zigzag Stitch

Sew in the same way as for straight stitch hemming. You may want to tighten upper tension to help give an added roll effect to your HEM.
23. TWIN NEEDLE SEWING

Stitching with two threads with different two colors is attractive and enjoyable.

A. Twin Needle Threading
Thread in the same way as normal threading (see page 9) except at the points ③, ⑦.

③, separate threads at right and left slits.

⑦, pass threads separately to right and left guides.

Thread each needle.

Zigzag width control should be set between 0-3.5. To set control above 3.5 will cause needle breakage.
B. Decorative Tucks Or Designs

Any stitch can be used with the twin needle for decorative effects. Most attractive are the multiple stitch zigzag and blind hem stitch for fancy tucks. The satin stitch or tapered zigzag designs in two colors are effective for creative trims.

**Caution:** Remember to use no more than 3 zigzag width for twin needle sewing.

C. Pin Tucks

Narrow tucks, sewn with thread that matches the fabric, produce subtle decoration on plain fabric. Using the twin needle, sew straight lines on the fabric guiding the edge of the presser foot along each successive tuck to make parallel rows. Soft fabrics could be pulled to form a soft crease. To achieve a tuck on a fabric, increase the lower tension slightly. Heavier fabrics will produce two lines of straight stitching. Attractive pin tucks are made with the multiple stitch zigzag as well as with a straight stitch.

**NOTE:** Transparent tape makes straight lines easy to sew. Just sew with the presser foot guiding along the edge of the tape. When sewing is completed peel off tape.
24. APPLICATIONS OF THE MULTIPLE ZIGZAG STITCH

A. Overcasting
The multiple zigzag stitch is an excellent choice for overcasting. It keeps the fabric flat and prevents raveling. For most fabrics, this stitch is better than the zigzag stitch for overcasting. The stitch should fall right at the raw edge of the fabric. Feed the fabric under the presser foot by guiding the raw edge along the right hand side of the hole in the presser foot.

B. Patching
The multiple zigzag stitch is an excellent stitch for patching. It is stronger than the zigzag and the tiny stitches bury into the fabric to make an almost invisible stitch when using matching thread. Place the patch over the right side of the worn or damaged area. Sew around the patch with the multiple zigzag stitch letting the last stitch to the right overcast the edge of the patch. When turning corners leave the needle in the fabric at the corner. Usually this will be the furthest stitch to the right or left. In this way, the corners are doubly stitched and very strong. When the patch is stitched in place, trim away the excess worn fabric on the wrong side of the patch.
C. Mending A Tear Or Instant Darning

The multiple zigzag stitch provides a strong and easy repair for torn garments. It gives an almost invisible mend, especially when a fine darning thread is used.

To mend a tear, hold the torn edges close together and stitch down the middle.

If the tear is guided under the slot in the middle of the presser foot, stitching will be equal or both sides. If necessary, sew again on either side of the first row of stitching making sure the needle catches the stitch in the center. With very worn or frayed fabric, place a piece of lightweight interfacing or cotton batiste under the tear for reinforcement.

D. Understitching Facings

The multiple zigzag stitch is an excellent choice for understitching and eliminating bulk in facing seam allowances.

After attaching the facing to the garment, trim and clip the seam allowance as usual. Press the seam allowances toward the facing and use the multiple stitch zigzag close to the seam, stitching through the facing and the seam allowances.

Using a matching thread, the stitch will blend into the fabric and prevent excess bulk. This is much more successful than a straight stitch for understitching. It really helps to keep the facings from rolling.
E. Lace Applications
Attaching laces or trims adds a special touch to lingerie, dresses, or linens. Pin or baste laces in place easing or mitering corners where necessary. A straight edge lace or braid has a convenient line to follow when sewing. When using a scalloped edged lace follow the design of the lace for an almost invisible application.

F. Decorative Effects
As with the blind hem stitch, the multiple stitch zigzag can be used for many decorative combinations. If the stitch is pivoted when the needle reaches the far left or right of its swing, and the points are carefully matched, a tracery diamond shape results. On the other hand, if rows of the multiple stitch zigzag are sewn with the points falling directly under each other, a wavy pattern is produced. Flowers may also be produced. Start in center; pivot at points shown. Add four more petals if desired.
25. BUTTONHOLE PREPARATION

Various fabrics require various methods of sewing buttonholes. Different methods are given below, with suggested uses. If you are in doubt as to which method is best for your fabric, test the methods in question and choose the best according to the finished appearance.

**Preparation**

For the best results, a good quality mercerized cotton thread should be used. Polyester threads often result in puckered or heavy unattractive buttonholes. The finer your fabric is, the finer your cotton thread should be. An interfacing should be used under the buttonholes to give body, to strengthen, and to help them withstand wear. To establish the correct length of the buttonhole, add the diameter of the button (A), plus the thickness of the button (B), plus 1/8 inch for the bartacks. The length may be marked on the garment with a basting stitch, tailors chalk, or transparent tape, as shown. Another way to make sure that all buttonholes will be the same size is to cut a piece of cardboard as wide as the buttonhole foot and long enough to make the distance between the toe of the white slide and the cardboard the size buttonhole needed. This method works for buttonholes up to 1-1/8 inches long. Horizontal buttonholes should extend 1/8 inch beyond the center line of the garment. Vertical buttonholes are placed so that the cutting space of the buttonhole is directly or the center line. Always make a practice buttonhole on a scrap of the garment fabric before making any buttonholes on your garment. On your test sample duplicate the thickness found in the garment and be sure to include the interfacing. The test sample should help determine the length needed for the button to pass through easily, and the stitch length for the particular fabric. As with the satin stitch, the stitches should be close together, but not so close that they pile up. Be sure to use the buttonhole foot.
A. Making Button-Holes
Make a test button-hole in a piece of material you are working with and check satin stitch spacing. Use slightly loose tension on top for neater finish. For stretch fabrics, lay a piece of paper where buttonhole will be placed.

B. Determining Length
Measure diameter (A) and thickness of button (B) and add 0.3cm (1/8’’) for bar tack. Mark buttonhole size on material.

C. Determining Width
Determine width from diameter and thickness of button and material being used.

Push back sliding base. Match arrow mark on foot with starting line a .

Bar tacking: Set pattern selector to ( ) and sew 5-6 stitches.

Left side: Change pattern to ( ). Sew left side from front to back until it reaches end line b .

Remember measurement arrow shows so it is not necessary to mark end lines b for all buttonholes.
Making Button-Holes (Cont.)

Bar Tacking: Change pattern to ( ) and sew 5-6 stitches.

Right side: Change pattern to ( ) and sew right side until it reaches first bar tack.

Quick finish: To prevent unstitching, set pattern selector at ( ) and proceed for a few stitches.

D. Cutting Button-holes

Stick a needle through bar tacks to prevent over-cutting. Cut button-hole along center with button-hole cutter.

E. Corded Button-holes

To reinforce button-hole, especially for knits, a corded button hole is useful.

1) Hook some crochet cotton onto the projection E on buttonhole foot, then through slit F holding both ends as shown in Fig. sew in same way as for an ordinary button-hole.

2) After finishing sewing, pull both ends of thread so that loop or other end disappears into button hole stitching.

3) Cut both ends of thread.
26. BLIND HEM STITCH

Used for hemming skirts, trousers, suits, etc., without stitches showing on right side of material.

*For elastic materials, use pattern (1/4*1/2).*

Fold material as shown (A) ... wrong side), and place it under foot.
(1)....for thick materials.
(2)....for thin materials.

*It is preferable to baste or iron hem beforehand.*

Adjust zigzag width so that straight stitches are made on hem edge and slanting stitches pierce only one or two threads of fold.

Adjust guide by turning small screw on right side so that it touches fold perfectly.

Sew carefully, guiding fold against guide.

1. needle is catching edge of fold too much
2. correct seam
3. needle is not catching edge of fold at all
27. APPLICATIONS OF THE BLIND HEM STITCH

A. Shell Tuck
The blind hem stitch gives a very effective and easy way to make a shell tuck for lingerie, pillowcases, and decorative finishes. This works well on knits or on the bias of soft, woven fabrics. A single folded bias tape may be tacked in this manner, and then applied under a fold for a decorative hem on pillowcases or applied with the facings at the neckline or armhole for a decorative finish.

Set the upper tension dial to a little bit tighter position than normal. Fold under the edge where the shell tuck is to be created. Place the bulk of the fabric to the right of the needle with the folded edge to the left. Place the fabric so that the folded edge will be guiding into the center cut of the foot. The straight stitches will form on the fabric, and the zigzag bite will swing to the left off of the folded edge. The shell edge is created as the needle swings back onto the fabric. The size of the "shell" can be varied by changing the stitch length.

B. Decorative Effects
By sewing two adjacent rows of blind hem stitching on lace or ribbon attractive decorations are created. The stitch may be pivoted when the zigzag bite swings to the left and the points matched in the second row. Another variation alternates the zigzag bites in the center of the straight stitch segment. The stitch may also be pivoted after two straight stitches to form a snowflake-like pattern.

C. Topstitching Effects
A new kind of topstitching effect can be produced by couching strand or two of pearl cotton embroidery floss, or yarn with the blind hem stitch. Simply guide the cord through the left groove of the embroidery foot so that the blind hem stitch sews over the cord and not through it. The straight stitches of the blind hem stitch will bury themselves along the right side of the cord. The sewing thread should match as closely as possible to blend into the fabric.
28. OVERLOCKING

Overlocking stitch sews a seam and overcasts edge of fabric at the same time.

This pattern is suitable for thin jersey material.

Use ball point needle to get better stitch performance.

29. APPLICATION DOUBLE OVERLOCK [VV]

Double Overlock
On fabrics that are bulkier or heavier, the double overlock is also a good choice.

The stitch is less dense and will prevent soft stretchy knits from rippling.
30. APPLICATIONS OF THE ULTRA STRETCH STITCH

A. Seaming
On most knits, a 3/16 inch finished seam, such as stitch and overcast or the overlock stitch, is more desirable than a 5/8 inch opened seam allowance. These stitches can create a neater, more professional finish, eliminate bulky seams, prevent curling, permit the garment to "give" under stress, and at the same time they cut down on the amount of work involved in making a garment. If ever in doubt as to which of the two stitches to use, test both on the particular fabric in question and choose according to their performance.

The stitch and overcast stitch is excellent for stretch fabrics such as sweater knits, bathing suit knits, and cotton knits. It has the greatest strength and elasticity of all.

For patterns with 3/16 inch seam allowances: Feed the fabric such that the needle goes over the raw edge of the fabric when it swings to the right.

For patterns with 5/8 inch seam allowances: Feed the raw edge of the fabric along the etched guide line "1/2", then trim away the excess fabric close to the stitching.

B. Procedure:
- Overlock stitching is used for seaming and finishing the cut edge of knit fabrics, all in one operation.
- This overlock stitch is especially good for stretch fabrics such as double knit and jersey and will give a firm, neat edge finish.
31. APPLICATIONS OF THE DOUBBLE OVERLOCK STITCH

A. Seaming

This stitch gives a finished 1/4 inch seam in one step. For knits, it gives strength and elasticity to the seams and prevents the curling of the fabric that often occurs with 5/8 inch opened seams. It is most applicable to soft, thin knits such as nylon or acetate knits, but may be used on other fabrics as well. Always make test seams with this stitch. For woven fabric, the double overlock stitch gives strength and prevents raveling. It can be used on woven goods to replace flat felled or French seams. For patterns with 1/4 inch seams: Place the raw edge of the fabric under the presser foot so that as the needle swings to the right, it comes down at the raw edge. This will result in an enclosed seam allowance. For patterns with 5/8 inch seams: The seam allowances may be trimmed to 3/16 inch either before or after sewing. If trimming before sewing, proceed as above. Otherwise, sew the seam with the raw edge of the fabric on the etched guide line "1/2". (Any time you use the full width of a particular stitch, you should readjust the raw edge of the fabric 1/8 inch to the left.) Afterward, trim the excess fabric near the stitching. This method is actually easier than the overedge method for fabrics that curl.

B. Hemstitching Effect

By using a very large needle and a fine thread an openwork effect can be attained which is beautiful for sewing the hems into tablecloths, napkins, placemats, handkerchiefs, etc. Use a large needle, size 18 or 20, and a fine cotton thread. Tighten the upper tension slightly, until the stitch looks better on the underside than on top. (You will be sewing with your fabric face side down.) Turn up 1 inch then turn up 1 inch again to form a hem of a double thickness of fabric. The bulk in corners can be eliminated by trimming away the excess, as shown, after having folded the fabric on all sides: Stitch from the wrong side, so that the straight stitch forms on the single layer and the zigzag bites on the double layer. Stitch all the way to the edge of the fabric along all sides.
C. Topstitching Double Overlock

The double overlock stitch can be used to topstitch nonraveling fabrics such as felt or leather into place for appliques or pockets. Stitch so that the straight part of the stitch is formed over the edge of the leather, and only the zigzag part holds it in place.

D. Procedure:

- Double overlock stitching is used for sewing overlapping seams, decorative hems, binding and edges on woven and elastic fabrics.
- To saw an overlapping seam, place one piece of fabric 1 cm over the other piece and sew the flatlock stitch over the fabric edge on the right side.
- You can produce a decorative hem by folding a single hem on the wrong side and sewing the flatlock from the right side.
- Use knit trim or bias binding when binding curved edges, like round necks and armholes.
32. APPLICATION OF THE RICK-RACK

A. Topstitching/Rick-Rack
A decorative topstitch can be produced with the rick-rack stitch. Stitch around the structural lines of the garment for a special effect. Topstitch braid or a decorative inset to add an additional creative flair.

B. Tapering/Rick-Rack
The rick-rack stitch may be tapered to form creative stems and petals of flowers, embroidered pictures and wall hangings. As in tapering the zigzag, slowly turn the stitch width dial from 0 to 7 and back to 0. A group of these tapered rick-rack stitch will form a bouquet-like effect.

C. Procedure:
• The elastic rick-rack stitch is a zigzag line of stitching that is desired so that seams may be pressed open.
• Apply this stitch to areas of stress on both wovens and knits.
• Use narrow width of zigzag as a heavy duty triple stitch for seams.
• Use medium and wide widths of zigzag for overcasting edges of seams, facings and hems of heavier weight fabrics such as terry cloth, and for attaching elastic. Use also for decorative stitching.
• Guide your fabric from the front. Do not pull or push as it will cause poor stitching.
33. SMocking

A. Gathering
Loosen upper tension slightly. Sew two straight seams on part for smocking with stitch length 4.

Make knots in one end.

Gather fabric towards knots while holding ends of lower threads.

Sew smocking stitches on gathered part between two straight seams.

Take out threads used for gathering after you have finished.

B. Elastic Thread Shirring
Cuffs and bodices of little girls dresses can be shirred easily with the smocking stitch. Place the right side of the garment down on the bed of the machine. Place two strands of elastic thread under the foot. Stretch the elastic thread while sewing with the smocking stitch to gather cuffs or bodice for a feminine effect.

C. Procedure:
- The smocking stitch is a very useful special ultra-stretch stitch.
- Lingerie or tricot seams should only be about 1/8 inch finished width.
- Fagoting can be achieved by joining the folded edge of two piece of fabric together with a gap between them. Use a sheer flesh colored piece of fabric underneath to make the fagoting much stronger and prettier.
- Do the fagoting with a piece of paper underneath and remove the paper by hand washing.
34. ZIPPER SEWING

Foot...Zipper foot

By using the special zipper foot, zipper sewing can be easily done without turning the material.

(1) With right sides together, tack along seam line of the opening [A].

(2) Open the tacked seam and pull out the lower material 0.3cm (1/8”). Place the folded edge over the right side of the zipper and tack over it.

(3) Replace the presser foot with the zipper foot on the left of the needle. The zipper foot can be shifted either to the right or the left of the zipper, so the zipper can be sewn without difficulty. Stitch from the bottom to the top. Remove the tacking.

(4) Turn the material to the right side. Ease the material and the zipper. Tack a measured 1.3cm (1/2”) from the tacked seam as a stitching guide. Shift the zipper foot to the right of the needle. Double-stitch across the lower end, then up along the zipper. Remove the tacking.
35. CORDING

Cording with one thread

Draw design on material with a pencil or tailor's chalk.

Pass cord under spring of centre hollow on cording foot, then to groove a back of foot.

Decide width and length of stitch according to thickness of cord.

Sew on cord along design while guiding cord.

Cording with three threads

Set pattern selector at .

Set three cords, in the same way shown in above.
36. EMBROIDERY

Remove foot, foot holder and holder screw. To avoid lower thread being pulled up, reduce upper thread tension.

For good embroidery, it is important to use correct needles and thread.

Use thin embroidery silk for upper thread, and a thinner silk of same kind and color for lower thread. Trace your design on material and center it in embroidery hoop. Make sure material is taut.

Pull up lower thread by turning handwheel towards you while holding upper thread lightly.

Lower presser foot lifter.

Hold both threads and start filling in the design with satin stitch, working inwards from the outline. Guide the hoop slowly with left hand, controlling zigzag width with right hand. To finish filling, sew several stitches with zigzag width at 0.

Lay typewriting paper underneath when embroidering sheer fabric.

<table>
<thead>
<tr>
<th>Needle</th>
<th>Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.9</td>
<td>120 ~ 100</td>
</tr>
<tr>
<td>No.11</td>
<td>100 ~ 80</td>
</tr>
<tr>
<td>No.14</td>
<td>60 ~ 50</td>
</tr>
</tbody>
</table>
37. ATTACHING ELASTIC

Pin elastic on material at sever. points.

Sew 5-7 stitches with stitch leng at "0".

Re set stitch length to 1 2. 
Sew along center pulling elastic ever both in front and behind foot.
38. MAINTENANCE

Your new machine requires regular cleaning and oiling for satisfactory performance.

A machine which is used for a few hours a day needs to be cleaned and oiled once a month.

Unplug machine before cleaning or oiling.

A. Disassembling Shuttle (for cleaning)

1. Detach needle plate using large screw driver and take out bobbin.
2. Bring opener (A) to far left by turning handwheel towards you.
3. Turn two pins B counterclockwise using small screwdriver, stop at an angle of 90°.
4. Push stopper C to right as far as it will go. Lift upper part of shuttle D and remove it.
5. Take out lower part E by pushing to left.

B. Cleaning

1. Brush off lint and dust from upper and lower parts of shuttle and wipe with a piece of cloth.
2. Brush off lint and dust on feed dog towards you.
3. Clean hook G and wipe with a piece of cloth.
C. Oilig  
Apply a few drops of oil around face \( H \) of hook and to center hole \( I \). After oiling, wipe with a piece of cloth.

D. Assembling Shuttle  
Reverse procedure used for disassembling shuttle.

* When lower part of shuttle goes down while pushing in pins \( B \), it is correctly fitted.

E. Changing Light Bulb  
39. TAKE OUT TANGLED THREAD IN BOBBIN CASE

1. Slide plastic plate A towards you. Insert the cleaning brush end into bobbin B, and lift it up.

2. Cut tangled upper thread C with Buttonhole Cutter.

3. Take out bobbin from bobbin case D and cut lower thread with Buttonhole Cutter.

4. Take off pieces of waste threads on bobbin case.
<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Correct Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine does not sew</td>
<td>Not plugged in properly.</td>
<td>See Page 6</td>
</tr>
<tr>
<td></td>
<td>Power supply switch is not on.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Thread is stuck in the hook groove.</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Spindle is pushed to the right.</td>
<td>11</td>
</tr>
<tr>
<td>Bobbin winder</td>
<td></td>
<td></td>
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<tr>
<td>Making noise</td>
<td>Lack of oil.</td>
<td>49</td>
</tr>
<tr>
<td>Running slowly</td>
<td>Lint or thread stuck in rotary hook.</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Lint stuck in feed dog.</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Machine kept in a very cold or very hot place.</td>
<td>Leave machine in a normally warm room for a few hours before use.</td>
</tr>
<tr>
<td>Breaking upper thread</td>
<td>Improper upper threading.</td>
<td>See Page 8</td>
</tr>
<tr>
<td></td>
<td>Upper thread tension too tight.</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Bent or blunt needle.</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Improper needle setting</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Removing fabric when take-up lever is not in the highest position.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Upper thread too thick or too thin for needle used.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Needle hole on needle plate damaged.</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Breaking lower thread</td>
<td>Thread not wound evenly on bobbin or not drawn up correctly.</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Lower thread tension too tight.</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Lint stuck in bobbin case and inside tension spring.</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Improper lower threading.</td>
<td>9</td>
</tr>
<tr>
<td>Skipping stitches</td>
<td>Improper needle setting</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Bent needle.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Improper needle and/or thread for fabric.</td>
<td>18</td>
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<tr>
<td>Issue</td>
<td>Cause</td>
<td>Page(s)</td>
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<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
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<tr>
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<td>Not using a ball point needle for elastic and thin fabric.</td>
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<tr>
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<td>Sewing foot not suitable for the work.</td>
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<tr>
<td>Stitches not locked</td>
<td>Upper thread tension too loose.</td>
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</tr>
<tr>
<td></td>
<td>Improper tension of lower thread.</td>
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</tr>
<tr>
<td></td>
<td>Improper needle for thread.</td>
<td>18</td>
</tr>
<tr>
<td>Wrinkled fabrics</td>
<td>Upper or lower thread tension too tight.</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Improper threading of upper or lower thread.</td>
<td>8,9</td>
</tr>
<tr>
<td></td>
<td>Needle too thick for fabric.</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Stitch length too long for fabric.</td>
<td>--</td>
</tr>
<tr>
<td>Fabric not moving</td>
<td>Lint jamming on feed dog.</td>
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<td></td>
<td>Feed dog is lowered.</td>
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<td></td>
<td>Stitches too close.</td>
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</tr>
<tr>
<td>Breaking needle</td>
<td>Improper needle setting</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Needle bent.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Needle clamp screw too loose.</td>
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</tr>
<tr>
<td></td>
<td>Upper thread tension too tight.</td>
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</tr>
<tr>
<td></td>
<td>Needle too thin for fabric or thread.</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Changing pattern or width of stitch when needle is down in fabric.</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Setting stitch width more than 3.5 when sewing with twin needle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presser foot attached improperly.</td>
<td>7</td>
</tr>
<tr>
<td>Light going out</td>
<td>Not plugged in properly.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Power supply switch is not on.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Light bulb burnt out.</td>
<td>49</td>
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</tbody>
</table>