University of Idaho
College of Agriculture

Cooperative Extension Service
Agricultural Experiment Station

Current Information Series No. 764

Serger Principles

Barbara Morales and Ernestine Porter

The Machine

Sergers sew about three times faster than conventional machines. Unlike a conventional machine, a serger will not "jam" when operated without fabric under the presser foot. Operators do not have to lift the presser foot when beginning or ending a seam. Feed dogs are located near the front of the presser foot and will pull the fabric into the machine. At the completion of a seam, operators can continue stitching, running threads out until they are long enough to be pulled around under the presser foot and cut with the serger's knife. This eliminates the need for thread snips or scissors at the machine and saves time.

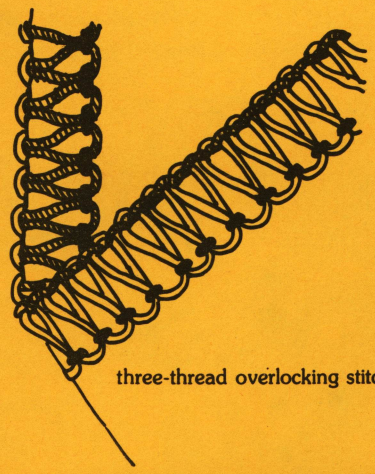
Sergers come in different models with a variety of functions — two, three and four spool machines. Each performs differently.

Three-thread sergers sew the seam, finish the edge and cut away excess seam allowances. The three-thread machine is the most popular type serger. It is more versatile in some models than others. Important features to look for in a three thread machine would be:

- the ability to convert to two-thread serging
- the ability to make a rolled hem

Narrow rolled hemming produces a narrow "satin" stitch on the edge of the fabric. The rolled hem is produced by adjusting tensions to cause the fabric to roll while being stitched. Use a very narrow stitch width and a very short stitch length.

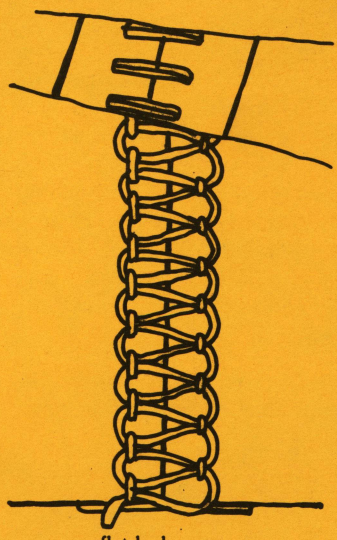
narrow rolled hem



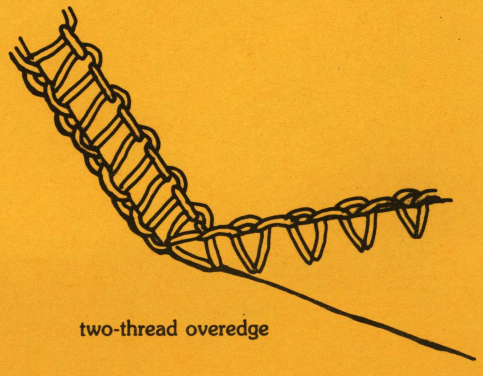
three-thread overlocking stitch

Three-thread serger seaming stitches the seam, finishes the edge and cuts away seam allowances. This type of seaming can be used on any light to medium weight.

The two-thread flat lock stitch is used to join two pieces of fabric. This gives it a decorative effect. It is also used to do a simulated blind hem. Only

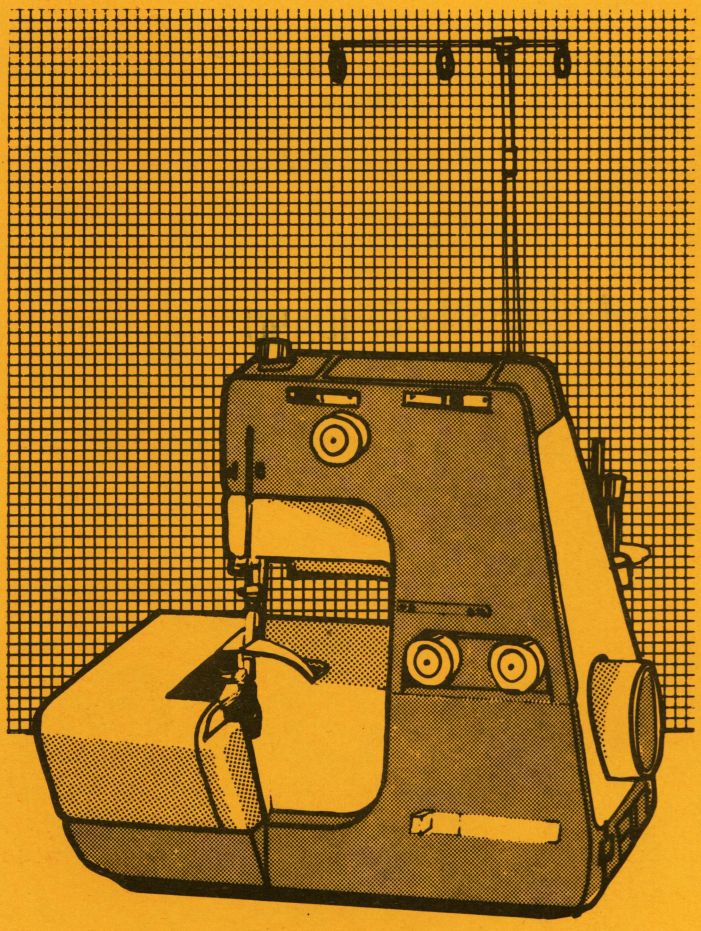


flat lock seam

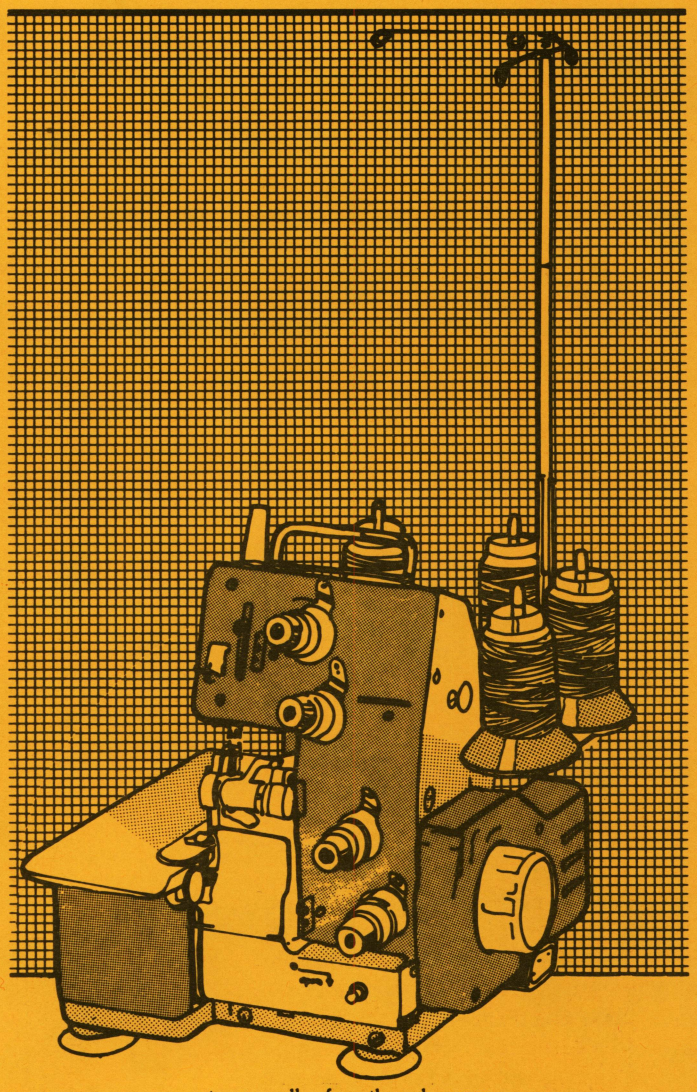


two-thread overedge

22



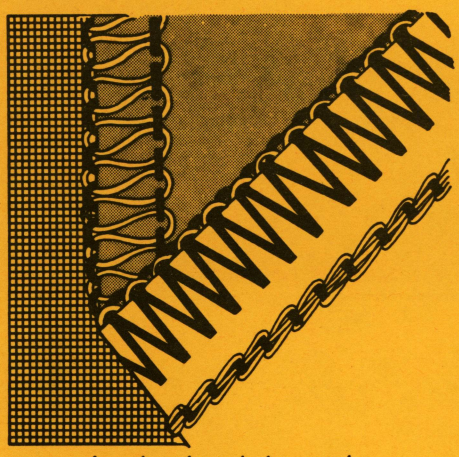
one needle, three-thread serger



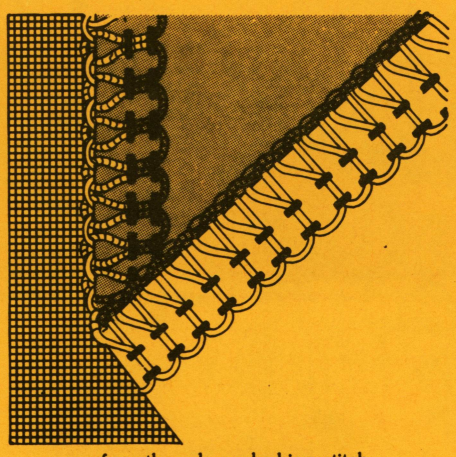
two needle, four-thread serger

machines capable of performing two thread functions can do the flat lock stitch and simulated blind hem. Two-thread serging also is used to finish edges of seams sewn with a conventional machine.

Four-thread machines have a double-needle system. This type of a serger overlocks the edge while sewing a straight stitch about ¼ inch inside the overlocking or down the center of overlocking. In most machines, the straight stitch is a chain stitch. Versatility is very limited in four-thread machines. Most will not convert to three- or two-thread functions or produce a rolled hem.



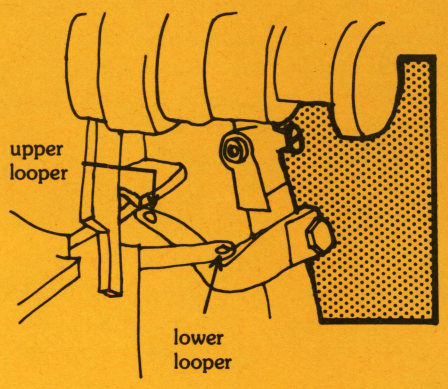
four-thread interlocking stitch



four-thread overlocking stitch

How Sergers Work

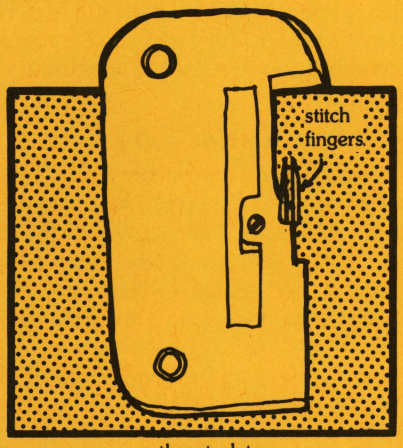
Sergers do not operate with a bobbin system but rather with a looper system. An upper and lower looper carry threads looping them around stitch fingers on the throat plates, forming stitches similar to the knitting process. As the stitches are formed, the needle thread intertwines to form the remainder of the stitch and inserts the thread into the fabric. The stitch-



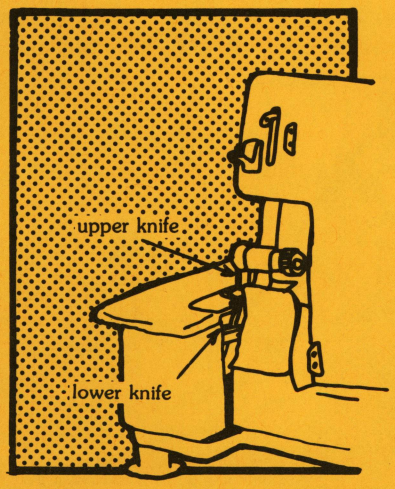
ing process is done immediately after the knives have cut away the excess fabric producing a clean finish.

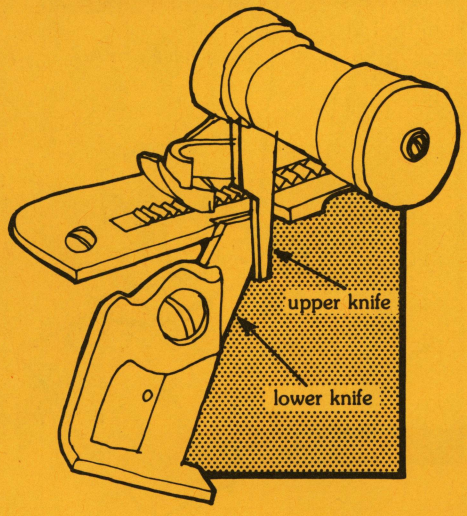
Knives

A serger sews the seam and also cuts off excess seam allowances. Two knives work like a pair of scissors to trim the fabric. One knife is stationary (usually the lower knife) while the other moves up and down. The motion of the knife is in conjunction with the rotation of the fly wheel.



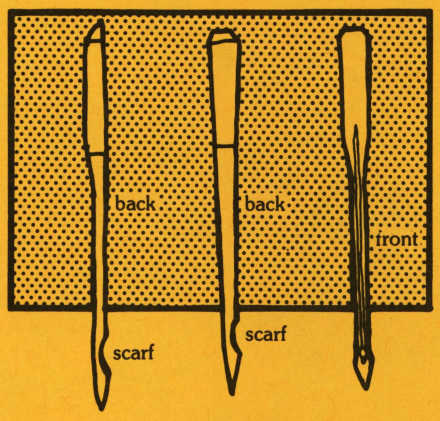
throat plate





Needles

Most sergers use industrial needles although some use domestic needles (those used in conventional machines). Industrial needles are shorter and, therefore, stronger for high speed sewing. They also have a "semi-ball point" making it unnecessary to change needles when sewing different types of fabric. Industrial needles come in sizes 11, 14 and 16 and should be selected as a domestic needle would be.



domestic needle
industrial needle

Industrial needles have a round rather than a flat shank. In order to insert the needle into the machine correctly, be certain that the "scarf" is to the back and the long groove is to the front. Always use a good, sharp needle for best results.

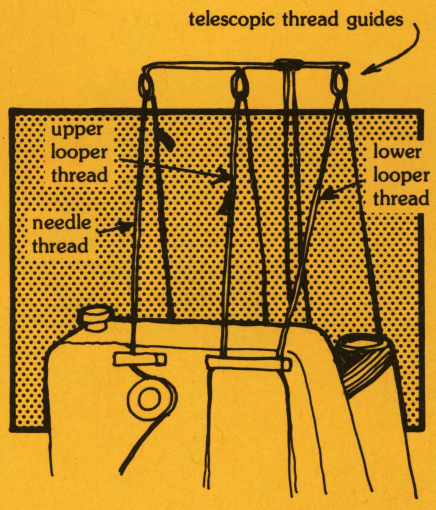
Selecting Thread

As with a conventional machine, a good quality thread is a must. Any thread that is "fuzzy" will cause lint build-up in your machine. Choose a thread that is a long staple polyester of good quality for your serger.

The cost of thread for sergers is often a concern. Cone thread is more economical and is readily available in a variety of colors, fibers and quality. Poor quality thread will not wear as well regardless of the type of machine you use.

Changing Thread

When a change in thread is necessary, simply cut the threads near the telescopic thread guides. Tie a slip or square knot, connecting the new thread to the old. Trim thread ends close to the knot. Gently pull threads from under the presser foot while running the machine slowly. Knots will pass through all thread



guides, tension knobs and loopers. The knot is unlikely to pass through the eye of the needle. Cut the knot out and rethread the needle.

If a knot should come untied, it will be necessary to thread the machine manually. Illustrations for threading are printed on the inside of the machine, and thread guides and tension knobs are color coded to simplify manual threading.

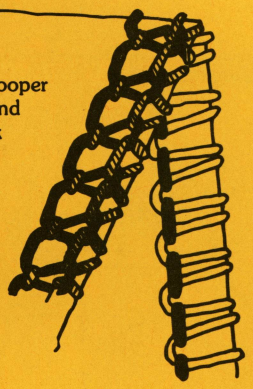
When threading a serger manually, begin with the upper looper thread, followed by the lower looper thread and then the needle. By threading the machine in this order, the looper threads will cross each other correctly to begin forming stitches.

Hint: Before beginning a sewing project, thread the serger and the conventional machine with matching thread. This allows movement from one machine to the other without stopping to thread machines, saving considerable time.

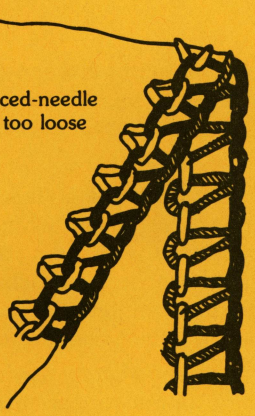
Tension

Sergers require tension adjustments in order to achieve various stitches. It can require a change in tension to accommodate various types of fabric. The number of tension knobs on a particular machine depends on the type of serger (2, 3 or 4 thread). There is one tension knob for each thread. Some models have what is called a "locking" tension knob. This type tension knob will rotate only one full turn thus limiting the ability to "fine tune" tension settings. Other machines' tension knobs are not locked and can be turned several full turns to achieve finer tension adjustments and a larger variety of stitches.

Tension Adjustments

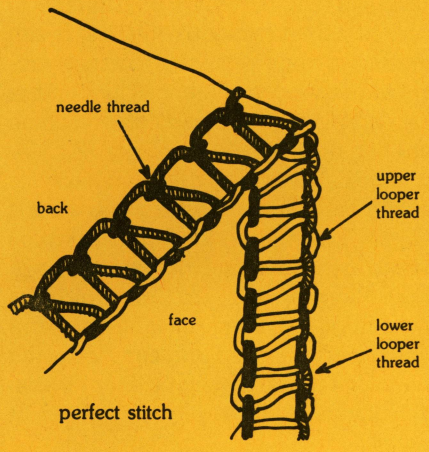


unbalance-upper looper thread laps round over the back



unbalanced-needle thread too loose

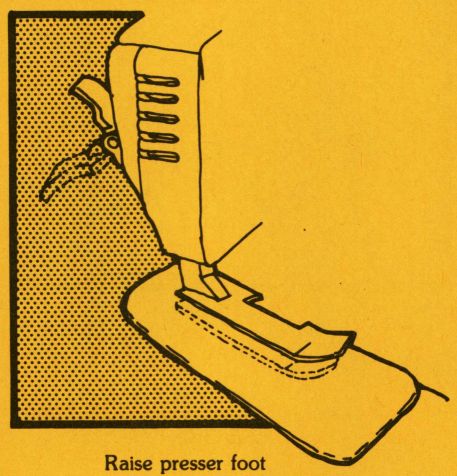
unbalance-lower looper thread laps round over the face



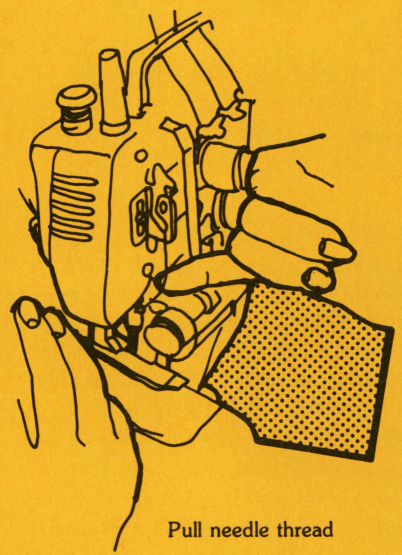
perfect stitch

Stitch Width and Length

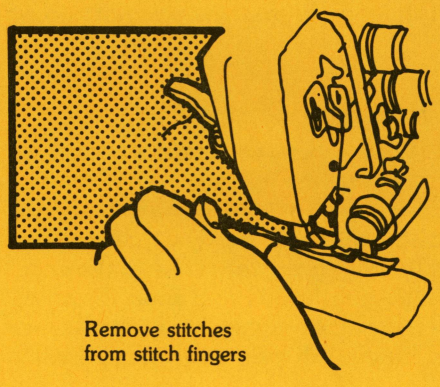
Most models of sergers have both a varying stitch length and width. The number of settings depends on the brand of the machine. As in conventional sewing, a shorter stitch length is desirable on lighter weight fabrics, while a longer stitch length is best for heavier fabrics. Stitch width refers to the width or "bite" of the overlock stitch. This too should be adjusted according to the weight of the fabric — narrower for lightweight fabrics and wider for heavier fabrics.



Raise presser foot



Pull needle thread



Remove stitches from stitch fingers

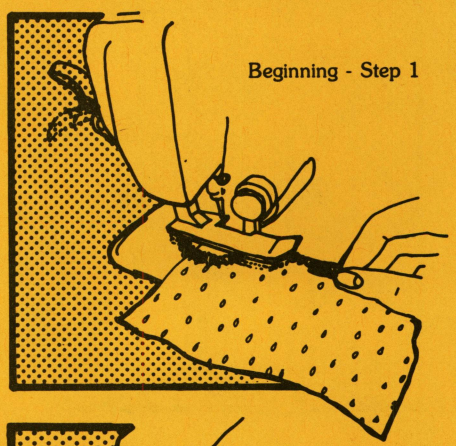
Operators must sometimes remove stitches from the stitch fingers. To do this, raise the presser foot. Gently pull needle thread just above the last thread guide. Carefully pull thread chain removing the stitches from the stitch fingers.

Pin basting is possible when using a serger. Pin fabric together with the head of the pins nearest the edge of the fabric. This makes it easy to remove pins with the right hand while continuing to sew and guide fabric with the left hand. Pins must be removed before reaching the knives, as pins will be cut in half. This will cause knives to dull rapidly and could cause other damage to the machine.

Securing Seam Ends

Garments are usually constructed by sewing the vertical seams (such as side seams) first and then crossing those seams with a horizontal seam such as a waistband, cuff, collar or hem, making backstitching unnecessary. In some garments, there are no horizontal seams, making it necessary to secure the end of the seam in some manner.

To secure beginning of a seam, sew a few stitches, stop, raise presser foot, stitch over thread chain for about 1 inch and cut remainder off with the knife.

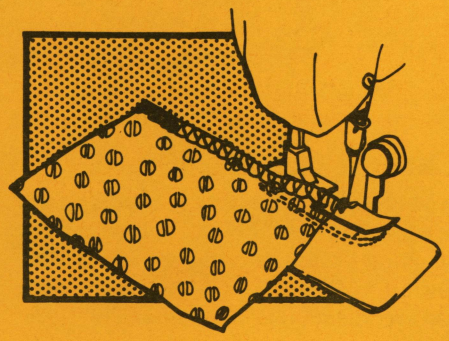


Beginning - Step 1

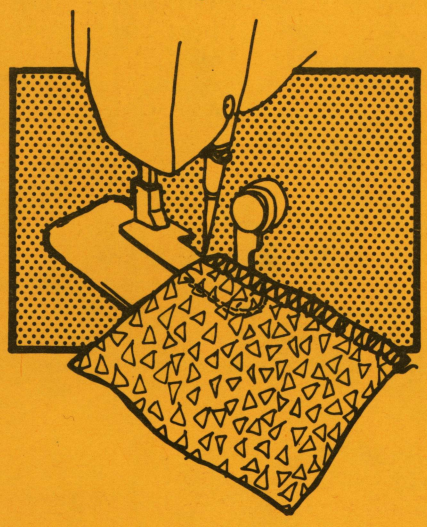
Beginning - Step 2

To end with "backstitching" on the serger, stitch to the end of the seam. As the machine takes the first stitch off the edge of the fabric, stop. Lift the presser foot, and gently pull stitches off the thread fingers. Turn fabric around, and stitch back up the seam for about 1 inch.

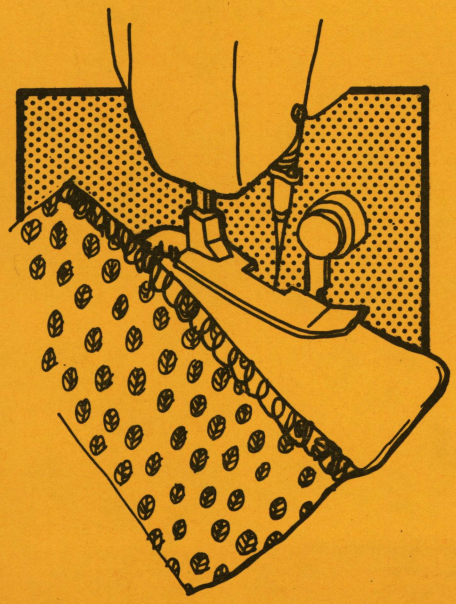
Ending - Step 1



Ending - Step 2

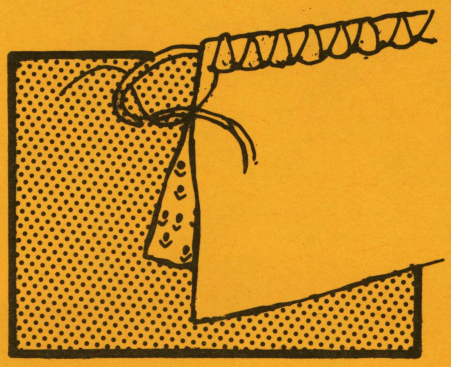


Ending - Step 3



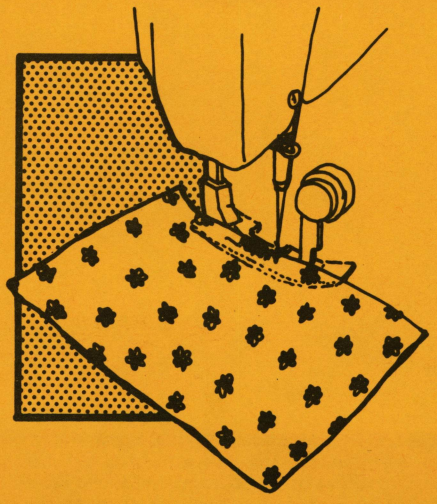
Fabric glue products such as Fray Check® can also be used to secure stitching. Other methods of securing stitches include:

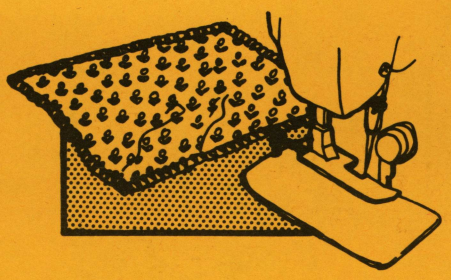
- knotting threads
- threading onto a large needle and running back under stitching, similar to methods used in hand embroidery.



Beginning and Ending Stitching at a Point

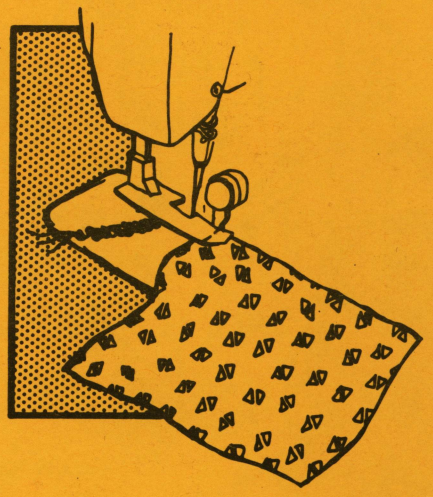
When beginning to stitch at a point other than a corner, first pull threads off the stitch fingers. Place fabric under presser foot and begin stitching. If sewing completely around a piece of fabric, overlap stitching for about ½ inch; then sew off the fabric. Secure threads by tieing knots or using Fray Check®.



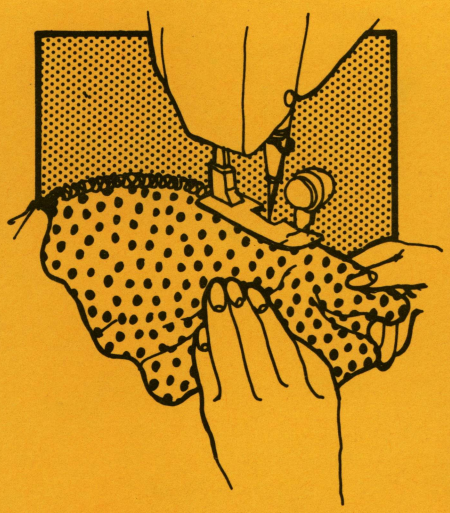


Curves and Corners

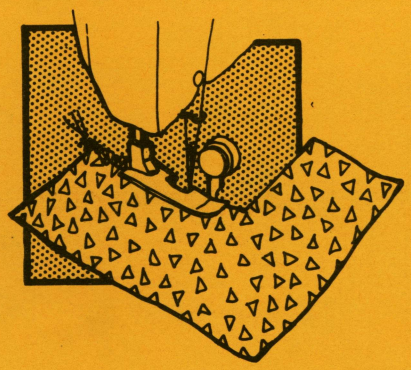
To turn right angle outside corners, stitch slowly up to the corner, and as the first stitch is being taken off the fabric, stop. Lift presser foot, and gently pull stitches off stitch fingers. Turn fabric so that the edge is touching the knife blade, and continue stitching.



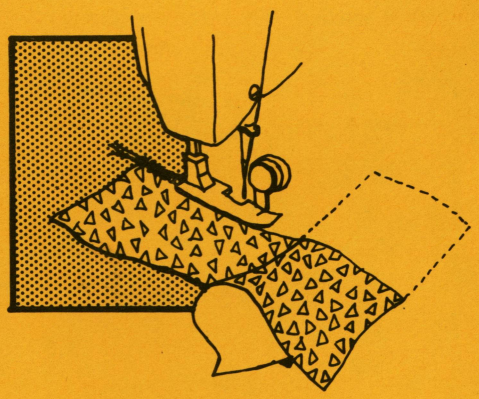
Serging around curves is done easily if fabric is correctly guided. Feed fabric into the machine with your finger tips at the front of the presser foot. Do not attempt to guide fabric at the side or behind the presser foot when sewing curves.

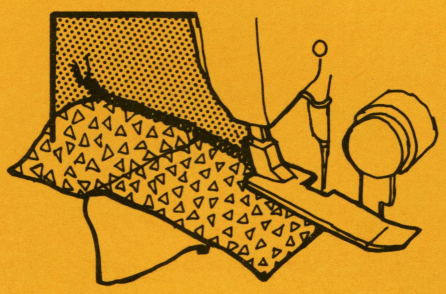


When turning right angle inside corners, stitch along first edge. As needle approaches the corner, fold fabric back,

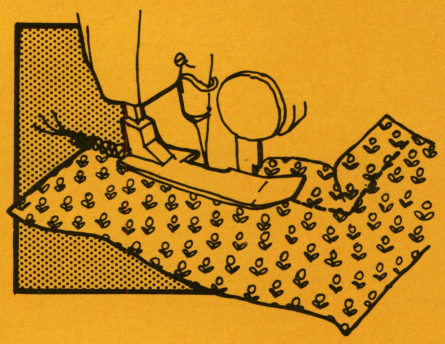


forming a small pleat, and continue stitching. Pleats should not be stitched in; fabric should lie flat when stitching is completed.





When seaming an inside corner, clip to seamline in the corner; then follow the same procedure described in turning an inside corner.



Care of the Machine

Sergers like other pieces of equipment need proper care. Oil as directed in your machine's manual using a good quality sewing machine oil. If the machine is used regularly, oil it about every 30 days.

Keeping the machine clean is important because sergers are cutting as well as sewing. Use small cans of compressed air to blow the lint from the machine. These products are available at camera and sewing machine shops. It is a good idea to clean the machine each time you start a new garment.

About the Authors

Barbara A. Morales is an Extension home economist in Jerome County, and Ernestine Porter is an Extension clothing and textiles specialist stationed in the University of Idaho School of Home Economics at Moscow.

Trade names are used to simplify the information presented. Use of these names neither implies endorsement of products nor criticism of similar products not mentioned.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, H.R. Guenthner, Director of Cooperative Extension Service, University of Idaho, Moscow, Idaho 83843. We offer our programs and facilities to all people without regard to race, creed, color, sex or national origin.

2M 10-85

45 cents per copy