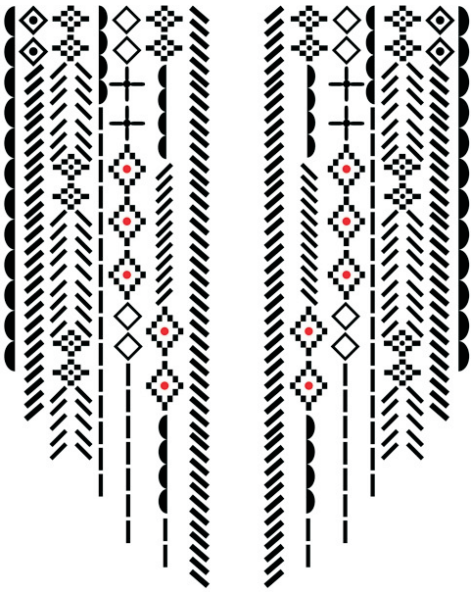
Specialty Machines

SPECIALTY MACHINES expand your sewing options and creativity. If you enjoy sewing, you may consider making your "hobby" a business. One or more specialty machines may be necessary. All of the machines discussed—mechanical and computerized—are available at local sewing machine centers. This ethnic embroidery pattern is one you can learn to make using specialty sewing machines. Be creative.



Objective:

Summarize specialty sewing machine types, basic operation, and maintenance.

Key Terms:

backing
blind hemmer
computerized sewing machine
embroidery machine
flatlock stitch
frame
hoop
industrial sewing machine
mechanical sewing machine
overcasting stitch
overlocking machine
pantograph
quilting
quilting machine
ready-to-wear
rolled hem
serger
specialty sewing machine
stabilizer
tailor
USB cable

Understanding Specialty Machines

A **specialty sewing machine** is an instrument precision engineered for a specific purpose: creating eyelet buttonholes, sewing leather, quilting, chain stitching, blind stitching, embroidery, etc.

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SPECIALTY MACHINE TYPES

Specialty machines are found in two types: mechanical and computerized.

Mechanical Sewing Machine

A **mechanical sewing machine** is a device that runs on electricity and contains mechanical gears and other parts. The user controls all levers, switches, knobs, and dials. To add a function—such as buttonholes—an accessory and parts may need to be added.

Computerized Sewing Machine

A **computerized sewing machine** is a device that runs on electricity and contains a microprocessor to control the various machine operations. Stitches and patterns and user settings are stored on memory cards or cartridges. After the initial user input, the machine controls most of the processes automatically. When attached to a computer with Internet access, you can download additional programs to add functions.

If you enjoy sewing and want to expand your options for advanced techniques, a variety of specialized sewing equipment is available. A standard sewing machine is a versatile piece of sewing equipment, but many options exist. Considerations when purchasing are:

- Cost
- Work accomplished by the machine (and work rate)
- Intended uses of each machine

SPECIALTY SEWING MACHINES

Industrial Sewing Machine

An **industrial sewing machine** is a device used by professionals in the needle trades industry that is built heavier than a standard sewing machine and often for a specific purpose—such as attaching buttons. Tailors, alterations professionals, and interior and exterior home product producers rely on industrial sewing machines to work long hours at peak efficiency. Industrial machines sew at a speed of 1,000 to 5,000 stitches per minute, which is well above the 250 to 1,000 stitches per minute of a standard sewing machine. The standard industrial sewing machine is designed and built to work longer and harder than the home sewing machine. The industrial machine:

- Sews thicker and heavier (leather, suede, denim, fur, etc.) fabrics
- Has an extended (and larger) work surface or table
- Is produced from heavier metal than a standard machine due to its intended longer and harder use by the operator

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ON THE JOB...

CAREER CONNECTION:
What Is the Job Description of a Tailor?

Research the career of a tailor using the Internet and your school library. What time in history did the job originate, and was it a job held by men or women? What was the early job description? Is it the same job description today? What skills are needed to be a tailor? Is there a market for tailors today? If so, where do most tailors work? How much do tailors earn? What is your definition of "made to order?" Gather all your information. Then type a report. Cite all your print and online sources.



A **tailor** is a person who sews clothing to fit an individual. Major clothing stores employ professional tailors. To become a tailor, you must first learn to sew and enjoy sewing. Then you must learn the operation of an industrial sewing machine and other specialty machines.



FIGURE 1. Professional tailors, alteration specialists, and seamstresses/seamsters use the industrial sewing machine pictured here. Aside from the size and weight of this machine, you probably recognize and are able to name several parts. Industrial machines sew at a speed of 1,000 to 5,000 stitches per minute, well above the 250 to 1,000 stitches per minute of a standard sewing machine.

Blind Hemmer

The **blind hemmer** is a stand-alone machine that sews only one stitch: the blind stitch. The blind hemstitch is visible on only one side of the garment: the backside. It uses only one thread and no bobbin. The machine produces this stitch at an amazing speed, and the finished product looks just like ready-to-wear items.

Ready-to-wear is clothing made in standard sizes and is sold on racks in stores. Many types use the blind stitch for hemming. For the seamstress/seamster who sews in volume and likes the finished look of ready-to-wear items, this may be a wise investment. [NOTE: The blind hemmer is available in personal use and industrial models.]

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Computerized Sewing Machines

Computerized sewing machines are electronic and are able to work hand-in-hand with your computer. These machines have built-in microprocessors that are able to produce hundreds of different stitches; some produce complex embroidery patterns. These sewing machines open an entirely new ability for you to create unique designs and stitches. They also encourage creativity.

A wide variety of brands and styles are available, and each has a specialty operation (stitch, device, or programming) that makes them attractive. While similar in style, all models are a little different. Therefore, it is important to read the manual that comes with the machine. Computerized sewing machines are more expensive than standard sewing machines; some are extremely expensive.

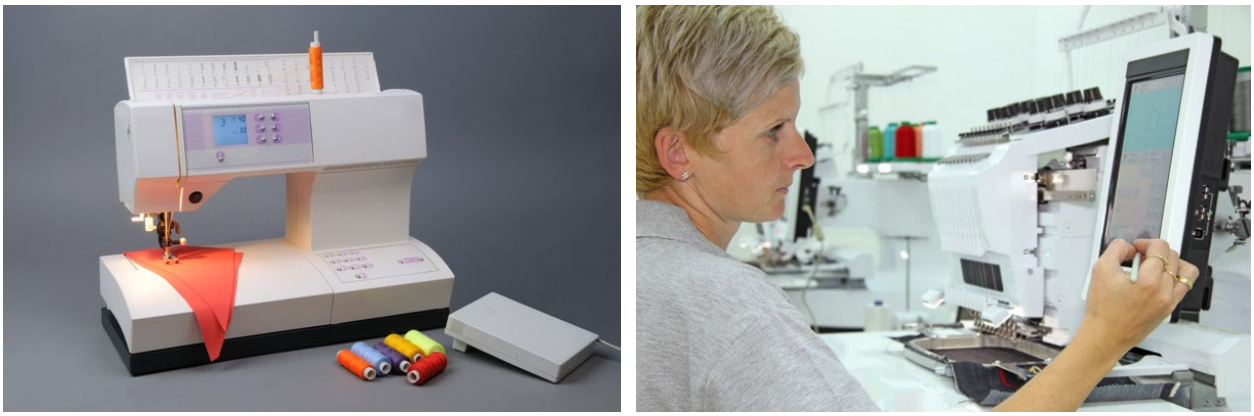


FIGURE 2. The computerized sewing machine is an easy machine to learn to run and is a "step up" from a standard sewing machine. Video and tutorial "how to" programs to learn the extra techniques available with your computerized machine are plentiful on the Internet. What are the main differences between a computerized machine and a standard sewing machine? What is the first thing you would create on a computerized sewing machine?

Serger or Overlocking Machine

The **serger** is a device that trims the seam allowance and encloses that fabric edge inside a thread casing (an overcasting stitch); it is primarily a seam-finishing tool. **Overlocking machine** is another name for a serger. The **overcasting stitch** is a series of stitches over an edge (seam allowance) to prevent the fabric edge from fraying as well as providing more stitch elasticity. A serger is a differential speed machine: The user can "speed up the feed" to create ruffles, waved edges (lettuce leaf), etc. [NOTE: Differential speed can be thought of as the way a car turns a corner. Some wheels are going faster (the outside wheels; farthest from the turn), and some are going slower (the inside wheels; closest to the turn). Ruffles and lettuce leaf edges would be formed on the outside edge where the speed in increased.]

A serger with more threads is more expensive. Typically, a more expensive machine has more options available. A serger allows you to set the width and depth of the stitching. Although the serger does not replace a standard sewing machine, it is a great addition to a sewing operation. For example, it sews faster, makes completing a garment faster, and creates

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stronger seams than a standard sewing machine. A serger is available with different thread use options, from two to five threads (in number). Some thread use options are:

- 2-4-thread machines: These machines create a safety stitch and a two-thread overlocked edge.
- 3-4-thread machines: These machines create seams with stretch as well as wider and stronger seams. The machines typically have rolled hem capability. They can function using three or four threads. A four-thread serger stitch is also called a "mock safety" stitch.
- 5-thread machines: In these machines, three threads are used on the overlocked edge and two are used for the straight seamline. Both the seamline and the overlocking stitch are created with the same machine. These stitches appear on ready-to-wear garments and often have a chain stitch detail. These expensive machines eliminate the need to create a straight seam with a standard machine.

Rolled Hem and Flatlock Stitch

Sergers are used to create rolled hems, to add ¼-inch elastic, and to create a type of flatlock stitch. A **rolled hem** is a narrow "roll" of fabric bent to the underside of the fabric by the serger with the edge enclosed with thread. It is used on lightweight fabrics (e.g., chiffon and silk fabrics) and is often seen on scarves and handkerchiefs.

A **flatlock stitch** is a technique that attaches two edges of fabric by covering both with machine stitches for a flat seam or decorative embellishment (e.g., no seam allowance, just two raw edges finished with a flatlock stitch; such as athletic and workout-clothing seams). A flatlock machine is available. However, some serger and overlocking machines create a similar look and strength.

Embroidery Machine

An **embroidery machine** is a computer-driven device that moves pantographs with hooped items in various directions to form different stitches. Pantographs are the part of the machine that rests on the table or surface space and moves the hoop to form an embroidery pattern. A **pantograph** is a bar, rack, or holder on which a frame or hoop is attached to the machine. It moves in X and Y directions (coordinate geometry) to form the design; motion is controlled manually or electronically. Embroidery machines may be stand-alone or an option on a computerized sewing machine. If it is part of a computerized sewing machine, the sewing base needs to be removed and the embroidery base added. Once added, you have the ability to attach a hoop to the machine.

Hoop

A **hoop** is a device made of plastic, metal, or wood that holds the fabric taut between an outer and inner ring; it attaches to the machine's pantograph. The machine hoop pushes the fabric to the bottom of the inner ring and holds it against the machine bed for sewing. The

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hoop moves underneath the needle, holding the fabric in place, as the design is stitched. Embroidery hoops come in all sizes and are specific for each machine.



FIGURE 3. The embroidery machine is an opportunity to add creativity to your sewing projects. What would you create on a jacket or hat if you had an embroidery machine? Can you see the inner and outer rings of the hoop?

Frame

A **frame** is a holding device for the piece to be embroidered. It stabilizes the piece using clamps, vacuum devices, magnets, or springs. The stand-alone embroidery machine requires the fabric to be stationary in a hoop attached to the machine. In all embroidery machines, the fabric in the hoop must be stabilized prior to hooping and/or framing.

Stabilizer

A **stabilizer** is a woven or nonwoven material placed on the wrong side of the fabric to keep that fabric from shifting in the hoop. **Backing** is another term for a stabilizer. Stabilizing secures the fabric from stretching, and nonwoven backing can be iron-on or sticky (on all fabrics). The embroidery world has a long list of products that make a specific embroidery task easier. Learning firsthand about embroidery techniques and products requires a trip to a fabric or a sewing machine center.

Home embroidery machines are used to add personalized detail and design to clothing and home products or gifts. Learning to use an embroidery machine opens the possibility of finding a career in the world of embroidery. Many home sewers move into retail embroidery production. The main difference between a professional machine and a home machine is the number of threads that the machine runs. Generally, the professional machine has a larger number of thread options. All machines require you to read the owner's manual carefully and to follow the directions.



FIGURE 4. The embroidery machine has a variety of ways to work with computer software. In this picture, the machine's screen allows you to input software information and designs in a commercial setting.

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Quilting Machine

Quilting is the process of sewing layers—top, batting, and backing—together to create a thick, padded product. It sometimes refers to the act of adding the decorative quilt stitches. A **quilting machine** is a long-arm device that sews fabric and batting layers together; then it follows a pattern or a free motion to apply quilt stitches automatically. Two ways to quilt with a long-arm machine are pantograph and custom quilting. The pantograph is traced by hand or by computer. Then the pantograph is repositioned in rows or columns all over the quilt top to create a seamless end-to-end design. Custom quilting is done freehand by the quilter and is typically more expensive than pantograph designs.

Like the embroidery machine, the quilting machine can be built in to a computerized sewing machine, or it can be a stand-alone machine in a studio. A long-arm quilting machine places the layers on a special frame with bars to eliminate tacking or pinning. The frames are mounted on a platform, and the platform rides along tracks to allow the machine to "ride across" the fabric layers. In contrast, a standard sewing machine would require the layers to be "fed through" the machine.

New quilting machine models arrive on the market regularly. The best way to learn about them is to visit local sewing machine centers. Like the embroidery machine, the quilting machine can be used for home use or to start a quilting business.

OPERATION AND MAINTENANCE

Learning to operate and maintain specialty machines provides the you with the ability to produce more finished-looking products with some ease. Most specialized machines have a long list of techniques to learn. In addition, they make clothing and interior and exterior products quicker and easier to complete. We will touch on the following for each type of specialty machine:

- Operational and maintenance skills are provided in several ways:
- Formal lessons (via the sewing center or sales representatives)
- Sewing books and manuals
- Online tutorials
- Online special techniques videos

Industrial Sewing Machine Operation

The machine manual is the best option to become acquainted with the operation of an industrial sewing machine. Operation is similar to that of the standard sewing machine.

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Threading

Threading is similar to the standard machine. However, clipping the thread at the spool and knotting a new thread to it is how some industrial machines are threaded. The new thread is then pulled through to the needle and moved through the eye.

Bobbin

Bobbin use is the same as for a standard machine. It is important to read the owner's manual and to follow the directions explicitly. The longevity of the machine is directly related to correct operation. If the machine fails to run smoothly at any time, it is stopped, examined, and adjusted before sewing continues.

Industrial Sewing Machine Maintenance

Maintenance of this machine is important. High-volume use industrial machines require all moving parts to be oiled every 4 to 5 hours of use. The owner's manual provides details about oiling. Some machines are oiled and sealed (do not require additional oiling) before leaving the factory.

Oiling

A machine should only be oiled if it requires additional oiling. Also, high-quality sewing machine oil should be used.

Lint Removal

All lint should be regularly removed from the machine, including from all cracks and crevices. A lint brush removes loose threads from the bobbin area, and tweezers can be used to remove any stuck threads. A damp cloth should be used to wipe away any dust, dirt, or oil from the surface area and the machine head.

Covering

Covering the machine anytime it is not in use eliminates dust accumulation.

Checking and Tightening Screws

Due to the high volume and speed of the industrial machine, checking and tightening screws regularly is highly recommended.

Blind Hemmer

The blind hemmer operates much differently and has several names for parts than that for a standard sewing machine. If purchasing a blind hemmer, a lesson at the place of purchase is wise to learn how to use and maintain all parts. For example, run a check on the machine and on the garment to ensure that the stitching depth is set correctly. Then, if necessary, adjustments can be made before hemming the entire garment, curtain, tablecloth, etc.

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Maintenance of the blind hemmer is similar to other specialized machines, but it is extremely important to lubricate according to the manual instructions. The use of high-quality sewing machine oil is recommended. In addition, keeping the blind hemmer free of dust, threads, and excess oil (with brushes, damp cloths, and vacuums or compressed air) is required.

Computerized Sewing Machines

Computerized sewing machine operation is similar to that for the standard sewing machine. NOTE: A major difference between the standard machine and the computerized machine operation is the dials and stitch patterns. The stitch patterns and other dial information are found in small monitor displays for easy operation of the computerized machine. Some machines are directly connected to a computer. As work is entered on the computer, the machine sews it. The maintenance is the same as a standard sewing machine. The machine manual should be followed for complete maintenance directions.

Serger or Overlocking Machine Operation

To operate a serger, read the machine manual and follow all instructions. The three-thread overlock is the most basic stitch and a good stitch to start with when learning the serger. For instance, the manual shows you how to thread each specific machine type and model.

Threading

Threading can be the most difficult part of learning how to use the serger machine. Each machine is a bit different, and the manual is the best option for instruction.

Tension Discs

Each of the threads has a tension disc, and each disc must be set to the correct number.

Cutting Blade

The cutting blade can be set at the width required for the seam.

Serger or Overlocking Machine Maintenance

Serger maintenance is similar to other machines but is conducted more often (than for other standard and specialty machines) because of the large amount of lint accumulation caused by the cutting blades.

- First, the machine is unplugged. Then any threads and the needle(s) are removed prior to cleaning.
- Next, a lint brush is used to clean the lint from the lower areas of the machine. Tweezers are used to extract any fabric pieces stuck in the machine.
- The machine should be oiled with the sewing machine oil recommended in the manual.

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Embroidery Machine Operation

Embroidery machine operation differs slightly with each machine type and model. The end product is a detailed design made of stitches, and the design is achieved by machine software. The sewer can create the design, or designs may be purchased in the correct format for the specific machine and model. The best way to learn to operate the embroidery machine, after reading the manual and/or taking a lesson, is to just start using the machine. Knowledge increases with machine use. Also, machine information is constantly updated online, and a whole world of embroiderers are ready to share what they have learned.

USB Cable

A **USB cable** is the interface that connects the computer to a peripheral device—in this case, an embroidery machine. (USB stands for universal serial bus.) This cable is widely available. The connection of a USB cable between the embroidery machine and the computer is typical. However, embroidery software on the computer can be saved to a card that is then inserted into the embroidery machine once the design has been saved to that card.

Needle and Bobbin Thread

All machine types require needle thread and bobbin thread. You must accurately thread through the tension discs, the thread guides, and then the needles. The bobbin is actually inserted into the machine similarly to the standard sewing machine. Most machines use prewound bobbins.

Embroidery Machine Maintenance

Embroidery machines require frequent cleaning.

- Needles are changed often due to the speed and use wear. Regular needle replacement produces a better-finished product.
- Lint and thread ends must be removed from the machine on a regular basis.
- The machine should be oiled regularly according to the owner's manual.

Quilting Machine Operation

Quilting machine operation is quite different for each machine type and model. So read the machine manual and follow all instructions carefully. A wide range of tutorials, articles, and videos are available online. In addition, most sewing machine centers offer free lessons when purchasing a quilting machine.

Quilting Machine Maintenance

Maintenance of a quilting machine is quite different for each machine type and model. For example, some machines are oiled regularly, and others are not. Again, paying close attention to the instruction manual with the machine is the best advice.

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Summary:



A standard sewing machine is a necessary piece of sewing equipment. A specialty machine is not necessary, but it provides many new options. Each specialty machine has its own pros and cons. Each machine has a specific purpose, and the operation and maintenance is available via the machine manual. The industrial sewing machine and the blind hemmer are considered professional machines. Quilting machines, embroidery machines, computerized sewing machines, and sergers can make the sewing process quicker and easier. They are available in personal-use models.

Checking Your Knowledge:



1. List the similarities and the differences between an industrial sewing machine and a standard sewing machine.
2. What would be the benefits of owning a blind hemmer?
3. What factors should you consider when purchasing a computerized sewing machine?
4. What is a serger? What are the advantages to owning a serger?
5. What projects would you create using an embroidery machine?

Expanding Your Knowledge:



Learn more about blind hemmers and their uses. Watch the YouTube video at http://www.youtube.com/watch?v=3xbXZXtcDus. Then explain in your own words how to create a hem with a blind hemmer. What are the differences between a blind hemmer and the standard sewing machine? What parts can you name on the blind hemmer? What is the job of each part?

Web Links:



Embroidery
http://www.emblibrary.com/EL/ELProjects/holder.aspx

Free-Motion Quilting
https://www.youtube.com/watch?v=yGNOS5JQHYQ

How to Use an Embroidery Machine
http://www.bestembroiderymachineadvisor.com/how-to-use-an-embroidery-machine

How to Use a Serger
https://www.youtube.com/watch?v=o8VHoWwPcDo

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