Organizing entity	ASSOCIATION OF INDUSTRIES OF FOOTWEAR AND ESPADILLES OF THE NORTHWEST OF MURCIA
Name of training action	Footwear and espadrilles sewing course
File Number	AC-2017-2662

Module 2 – Sewing Machine: Features machinery, calibration, operation and maintenance. The needle. Special threads for work jute

Objective:

Acquire the skills to know the machinery, adequate resources and techniques necessary to successfully complete the production process. The student will practice in the handling and cleaning of the machine, as well as in the change of bobbin, threading and regulation of tensions. The student will be able to differentiate the type of needle for each class of material. Exercises of placement and removal of the needle will be carried out as well as practices in the stippling without thread (straight line, dashed, curve, etc.) and in the sewing with thread (through the figured ones). You will also perform stitch length exercises.

Duration:

80 HOURS (10 PRACTICAL)

Theoretical and practical content:

UNIT 1. Types of machines
UNIT 2. Parts of the sewing machine
UNIT 3. Its operation.
UNIT 4. Work safety.
UNIT 5. The needle. Types. Utilization
UNIT 6. Threads, measures, types and uses

1.1 INTRODUCTION

The types of machines that make up a workshop will depend on the work we are going to perform.

The most common to perform almost all types of equipment are:

1.2 Flat needle machine.

1.3 Single needle column machine.

1.4 Zigzag machine

1.5 Column machine with two needles.

1.6 Edging machine.

1.7 Glue bending machine.

1.8 Machine to reduce.

1.9 Refining machine.

1.10 Chopping machine.

1.11 Machine to put plants.

Next we are going to do a brief review for each one, in order to get acquainted with them and know a little about their operation before we start sewing.

1.2 Flat needle machine.

With it we will carry out the following works (generally):

• Join seams that do not join zigzag.

• Put on loops or heels.

• Assemble the corresponding parts according to the model.

• Pass stitches to the edge to join pieces or as an adornment of the shoe.

• Put buckles and all kinds of fittings that entail their union through a stitching.

In short, we will carry out all types of work in which it is necessary to pass stitches, whether they are straight or curved.

1.3 Single needle column machine.

With it we can perform almost all the work that can be done with the one we have seen before; although for various models in which the assembly is more complex this machine will make a more specific function.

1.4 Zigzag machine.

With it we will join the heels that are made up of two pieces.

As the name implies, this machine joins the pieces with a zigzag seam. This implies a union without bulges; contrary to what happens when we join in the flat machine.

1.5 Column machine with two needles.

With this machine we can perform several functions:

Hemmed.

It is a question of folding the edges of the shoe with the help of a nozzle that we will place in the machine, at the same time that a ribbon is passing through the ribbons and the anger sewing over the bending of the edge.

Past ribbon.

With this process we will pass the ribbon over a previous bend in the glue machine.

Past ribbon on the back seam.

Here we will pass a ribbon over the seam of the heel that we have joined in the flat machine to cover said seam and so that it is not seen attached.

Open seams without ribbon.

As indicated in the statement, it is about opening the seam without passing the corresponding ribbon.

This is usually done when the model is wearing an inside heel.

1.6 Edging machine.

This machine is placing a ribbon on the edges so that they are not visible.

It is also done as an ornament or sometimes if the fabric is very fragile spinning so that it does not fall apart.

The ribbon goes through a nozzle that we will have previously selected according to the measure of the ribbon that we are going to place.

1.7 Reduction machine.

It is used to reduce the thickness at the edges of the pieces. Its purpose is:

• Facilitate the treatment of the banks.

• Allow seams without bulges.

• Avoid foot discomfort.

• Improve the appearance of the finished cut.

• Give the edge of the piece a uniform substance when the sections vary considerably.

1.8 Glue bending machine.

It is used for bending the edges after the recess or without it.

Sometimes the glue bending is accompanied by a thread that stays inside the bending; This helps us to ensure that certain very elastic materials do not deform or stretch with the glue bending process.

1.9 Refining machine.

It is used to trim the excess of the lining in the shoe, once mounted.

This work can also be done by hand using scissors.

Sometimes, the skin itself does not allow us to do it by machine even if we have it and have to do it by hand.

1.10 Choping machine.

It is a machine that, as its name implies, itches around the bottom of the shoe (the one that comes in contact with the sole) in order to carry the corresponding holes and facilitate sewing by "point of buttonhole".

1.11 Machine to put plants.

Also commonly called Coffee Maker.

Used in vulcanized footwear. As its name indicates, it is responsible for sewing the plant to the shoe for subsequent vulcanizing.

UNIT 2: Parts of the sewing machine

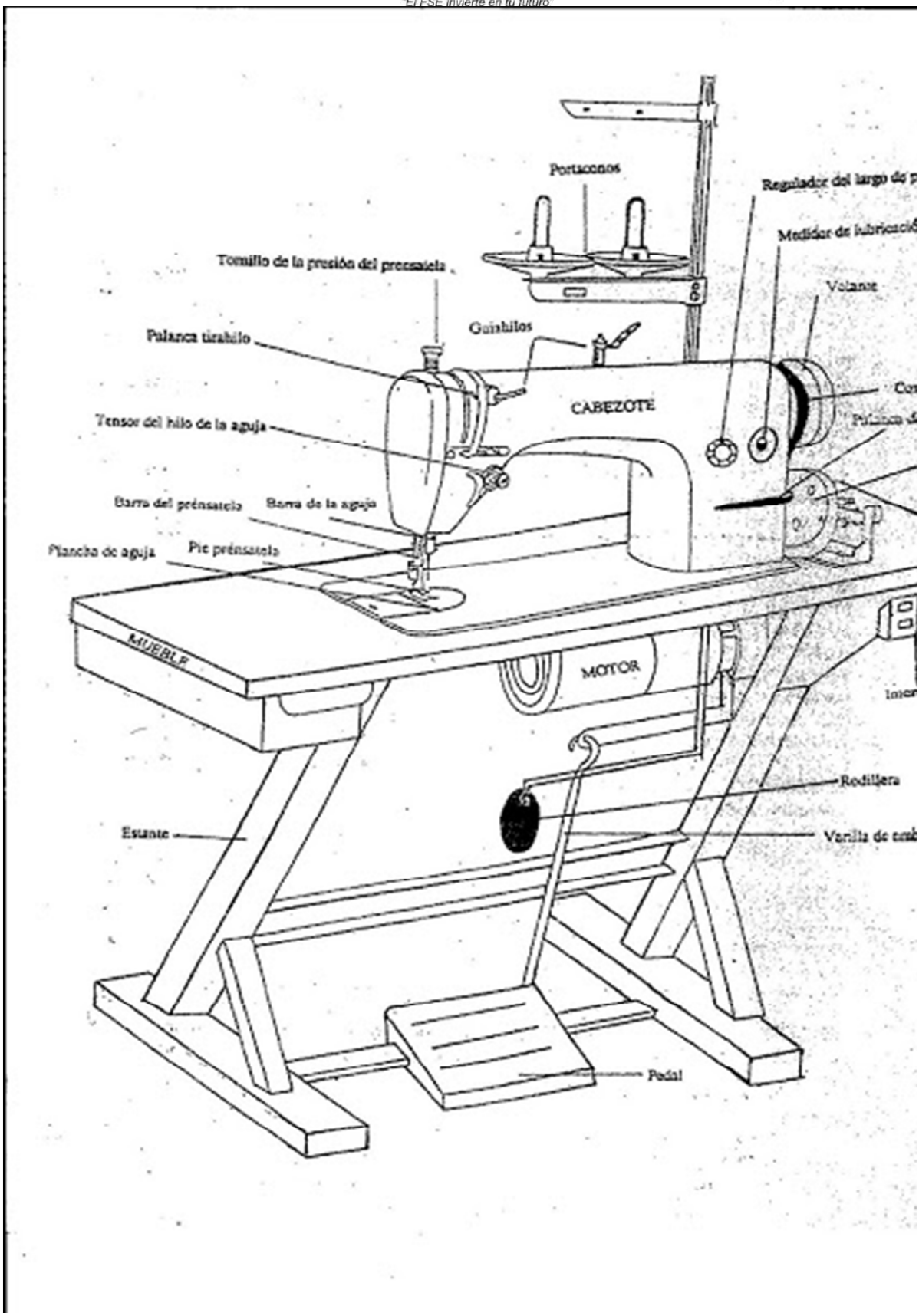
2.1 INTRODUCTION

If we talk about sewing machines we will be referring to all the machines that conform the sewing process. The ones we have seen in the previous topic.

In this topic we will see the parts of the machines with which we will assemble the footwear that we are going to make; we refer only to sewing.

We will give a PRACTICAL review in the handling and cleaning of the machine as well as in the change and threading of needle, change of bobbin and regulation of tensions.

Next we see the parts of which a machine is composed.


Portaconos
Tornillo de la presión del prensatela
Palanca tirahilo
Guíahilos
CABEZOTE
Volante
Tensor del hilo de la aguja
Barra del prénsatela
Barra de la aguja
Plancha de aguja
Pie prénsatela
MUEBLE
MOTOR
Rodillera
Estante
Pedal

2.2 PARTS OF A PARKING MACHINE

Guide threads: this serves to allow the passage of the thread to the needle.

Needle Thread Tensioner: Helps regulate the thread tension towards the needle.

Thread Pull Lever: used to tension the thread that goes to the needle.

Needle Bar: is the one that holds the needle by means of a screw

Presser bar or roller: where the presser foot or roller is placed and adjusted by means of a screw.

Foot Press: the one that allows to hold the fabric at the time of sewing.

Needle Iron: serves to support the fabric

Stitch Length Regulator: helps us change the stitching machine stitch of the desired or assigned length.

Lubrication Meter: shows the level of oil that the machine contains.

Reverse lever: is the one that makes the auction when starting the garment and finishing it.

Steering wheel: It is the one that is operated manually to give movement to the machine.

Hook: loop taker that together with the needle makes the stitch.

Canilla: it has a circular shape and thread is deposited there.

Knee pad: it is used to actuate the presser foot by raising and lowering it, it is operated with the knee.

In some models of machines this is in the same acceleration pedal of the machine (these are electronic machines with thread cutters), backing with the heel backwards the lifting of the rulina is activated, if we go back further we cut the thread.

Nowadays most of the machines have a computer that makes it much easier to use when working with them.

The most important thing to know is how to adjust the speed, make clips at the beginning of each seam, at the end or both; cut the thread, put labels, leave the needle up or down as it suits us etc.

UNIT 3: Its operation

The proper functioning of the machinery will depend largely on its handling and especially on its cleaning and maintenance.

As the operation we will see it working, here we will briefly review how to clean and keep our machinery ready.

Machine cleaning is one of the most important things when it comes to work.

For proper operation we must clean the machine every day and more thoroughly once a week.

Daily cleaning: Each day at the end of the day with the help of a brush, we will clean the hook and the most superficial parts of the machine, as well as proceed to grease it, pouring a couple of drops of oil between the two legs of the hook so that at Next day this, be well lubricated, since this is one of the machine parts that we should take care of the most.

Weekly cleaning: this will be more in depth than the daily one. If we have an air gun, we will do it with it: if we do not use the brush and if there are traces of glue in the parts of the machine we will use solvent that helps to eliminate the remains of glue.

Then we will make a greasing a little more exhaustive than we usually do daily.

Some machines have holes painted in red for which we must pour the oil: This helps us directly grease the most necessary areas.

If our machine lacks these holes we will do it for those that it has in the most specific parts of it.

Having a clean and well-oiled machinery will help us avoid malfunction and avoid possible breakage; Let us not forget that it is our work tool, with which we must take care of it and maintain it.

Another thing that we must keep in mind is that every time we start sewing we will have to hold the threads so that they do not get tangled inside the hook; This seems an unusual technique and which is easy to forget. However, once we get used to executing it, it will become a habit that we will hardly forget.

This technique, as well as removing the thread from the bobbin when we make the change of this, are habits that we must achieve and try not to forget.

These simple things will avoid many major disruptions.

There are some models of machines that have an oil tank for greasing. This tank must always try to keep it clean and to the maximum extent of oil, so that our machine is sufficiently oiled. As well as cleaning the filter by which the oil machine of this tank is nourished.

Every so often or whenever the continued use requires it, we must change the oil in the tank of our machine; (if available).

To do this we must empty it using a screw that has in the lower right part of the tank, loosen it, and drop the dirty oil in a container for later disposal in the corresponding container.

We will clean said tank, tighten the screw, and proceed to its filling.

To clean the engine, we will do it through holes that said motor has through which we will blow with an air gun so that accumulated dust or dirt can escape.

Important: All this we have just seen will always be done with the machine turned off to avoid possible accidents.

PRACTICAL ADVICE:

The sewing machine must maintain a constant maintenance of all its components by the sideboard, since if certain problems could not appear, the most frequent being the following:

- Needle heating.
- Wire breaks.
- Stitch failures.
- Uneven seams.
- Sewing curly.
- Dirt in the stitch.

Above all, the person in charge of pairing with the sideboards responsible for making the samples, being the tests prior to the conformity of the model for its manufacture, must perform a joint work with the modeller, since they will be responsible for transmitting the deficiencies found in the realization of the shoe cut, with the aim of making the corresponding rectifications in the patterns of the model.

UNIT 4: Workplace Safety

4.1 WORK ACCIDENT

Work accident is understood as any bodily injury that the worker suffers on occasion or as a result of the work performed by someone else.

1. Will be considered as accidents at work:

• Those suffered by the worker when going or returning from the workplace.

• Those suffered by the worker on the occasion or as a result of the performance of elective charges of a trade union nature, as well as those occurring when going to or returning from the place where the functions of said positions are exercised.

• Those that occurred on occasion or as a consequence of the tasks that, even if they are different from those of their professional category, the worker executes in compliance with the employer's orders or spontaneously in the interest of the proper functioning of the company.

• Those that occur in acts of rescue or others of a similar nature, when one or the other has a connection to work.

• Illnesses or defects, previously suffered by the worker, which are aggravated as a result of the injury constituted by the accident.

• The consequences of the accident that are modified in its nature, duration, severity or termination, due to intercurrent diseases, which constitute complications derived from the pathological process determined by the accident itself or have their origin in conditions acquired in the new medium in which the patient for healing.

2. It shall be presumed, unless proven otherwise, that the injuries suffered by the worker during the time and at the place of work are constituting a work accident.

3. However, the provisions of the preceding sections, shall not be considered an accident at work:

• Those that are due to force majeure foreign to work, meaning that it is of such a nature that no relationship is related to the work that was executed when the accident occurred. In no case shall force majeure be considered foreign to work, heat stroke, lightning and other similar phenomena of nature.

• Those that are due to intent or reckless imprudence of the injured worker.

4. They will not prevent the classification of an accident as work:

• The professional imprudence that is a consequence of the usual exercise of a job and derives from the confidence it inspires.

• The concurrence of civil or criminal guilt of the employer, a co-worker of the injured party or a third party, unless it is not related to the work.

4.2 PREVENTION OF GENERAL RISKS

RISK:

Falls of staff at the same level.

CAUSE:

This type of risk arises when the passage areas are not free of obstacles, the lighting is not adequate, the floors are irregular, slippery or dirty and due to the characteristics of the footwear.

PREVENTIVE MEASURES:

1. Remove all obstacles from the passageways, or mark and point out obstacles that cannot be removed and ensure that the aisles and transit areas are always clean.

2. Check that the lighting is adequate to the work being performed.

3. When a spillage occurs on the pavement of solvents, glues, etc., a non-combustible absorbent material will be poured on it and then swept and removed to the garbage container.

4. Regarding the type of footwear, the use of closed shoes is recommended.

5. Keep the soil well swept, free of dirt.

6. Always keep the work area in order and cleanliness.

4.3 SPECIFIC RISKS OF THE SEWING POSITION

RISK:

Blows / cuts by objects or tools.

CAUSES:

Punctures with sewing needles.

Use of scissors and cutters.

Cleaning the machine or removing bindings.

PREVENTIVE MEASURES.

1. Adjust the guides correctly.

2. Train operators in changing and basting sewing needles.

3. Use scissors only for the intended use.

4. Always clean the machine or unblock it with the machine stopped.

RISK

Projection of particles.

CAUSES

Untimely needle breaks.

PREVENTIVE MEASURES

Wear protective glasses.

RISK

Electrical contacts.

CAUSES

Bad condition of the machine's electrical system.

PREVENTIVE MEASURES

1.- Keep the electrical system in proper condition.

2.- Check the condition of the electrical components before commissioning

3.- If deficiencies in the electrical system are found, communicate it immediately.

RISK

Entrapment by or between objects.

CAUSES

Organs in motion of the machine itself.

PREVENTIVE MEASURES

1.- All the mobile organs of the machines will be protected by means of protection.

2.- Periodically check the machine drive devices.

RISK

Postural fatigue

CAUSES

Work continued in sitting position.

PREVENTIVE MEASURES

1. The jobs will be designed to perform ergonomically correct work.

2. Periodic stops will be made to rest.

3. The chairs used will be height adjustable and will have the backrest adapted to the lower back.

4. The necessary training will be given so that the operator keeps his back in a correct position (upright and straight).

5. Wrist movements will be performed periodically to counteract the damaging effect of repetitive sewing movements.

RISK

Visual fatigue

CAUSES

Poor lighting in the workplace.

PREVENTIVE MEASURES

1. Adapt the ambient lighting to the task to be performed and / or put light located in the flexo type workstation.

2. Schedule work stops to avoid visual wear.

3. Train the worker to periodically relax the view by looking at points as far away as possible.

UNIT 5: The needle. Types. Utilization

5.1 INTRODUCTION

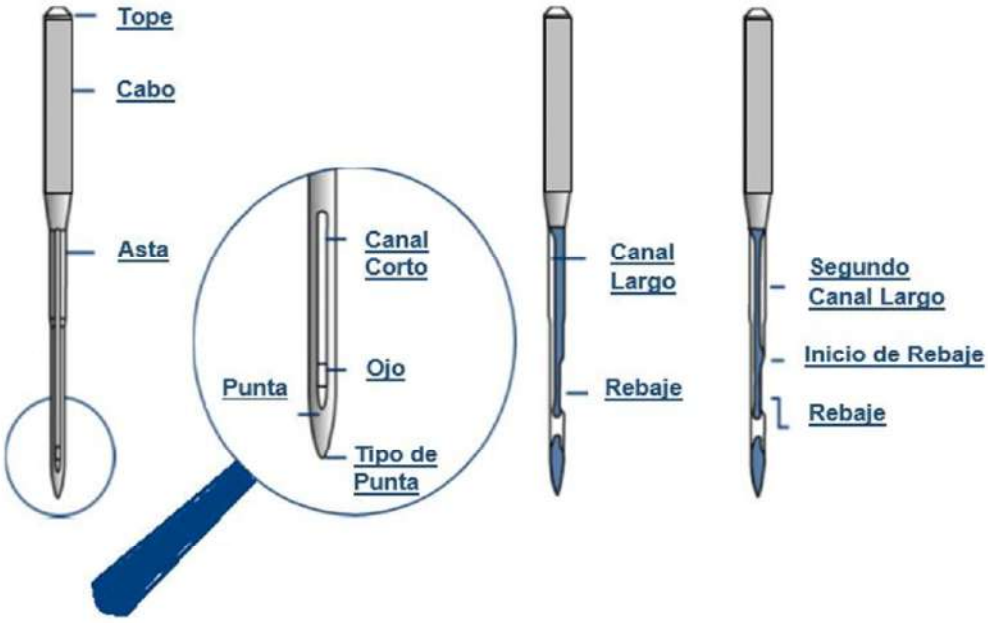
The main component of every sewing machine is the needle (s). Different needle systems have been developed over time to ensure that each machine that uses them has its best performance.

Different needle systems are introduced for many reasons such as the use of new fabrics, new sewing machinery and even increased machine speed.

Each needle system (type) has available between 6-8 sizes, and in the most popular systems there can be up to 15. All these needle systems and sizes are available with different needle tips.

5.2 The Needle: Parts, types and use.

5.2.1 Parts of a needle



5.2.2 Types and Use.

The needles are usually labeled with two numbers: the largest corresponds to the European measure and the smallest to the American.

For example: 120/19 needles, 120 corresponds to the European and 19 American. This type of needle is a thick needle, it is normally used in two-needle edging-column machines.

The smaller the number, the thinner the needle. The finer the needle, the finer the fabric for which it is designed. Easy, right?

The most normal when you start sewing by machine is to always use universal needles that, because of their versatility, are the ones that have the most applications. However, when we start experimenting with different fabrics, threads and stitches, things get complicated. Choosing the right needle is the key to smooth and perfect stitches, but not only that: if we work with the wrong needle we can have problems when sewing. From damaging the fabric or thread to bending or breaking the needle.

There are more than 800 different models and references of needles; therefore and not to go crazy we are going to focus on three, (depending on the type of needle tip) that will be the ones that will serve us for the tissues that we will normally use.

- Ball tip: this needle is used for weaving and especially for elastic.

Having the round tip, they do not pierce the fabric but rather separate the fibers without breaking them, thus avoiding hooking or piercing it.

- Punta Espada or Leather (leather): Its tip is in the form of a blade and what it does is tear the fabric slightly and almost imperceptibly to allow and facilitate the stitch.

- Triangular tip: Round tip with a small polished triangle at its end.

We usually use this needle in the splitter skin, because the split is a normally softer and thinner fabric.