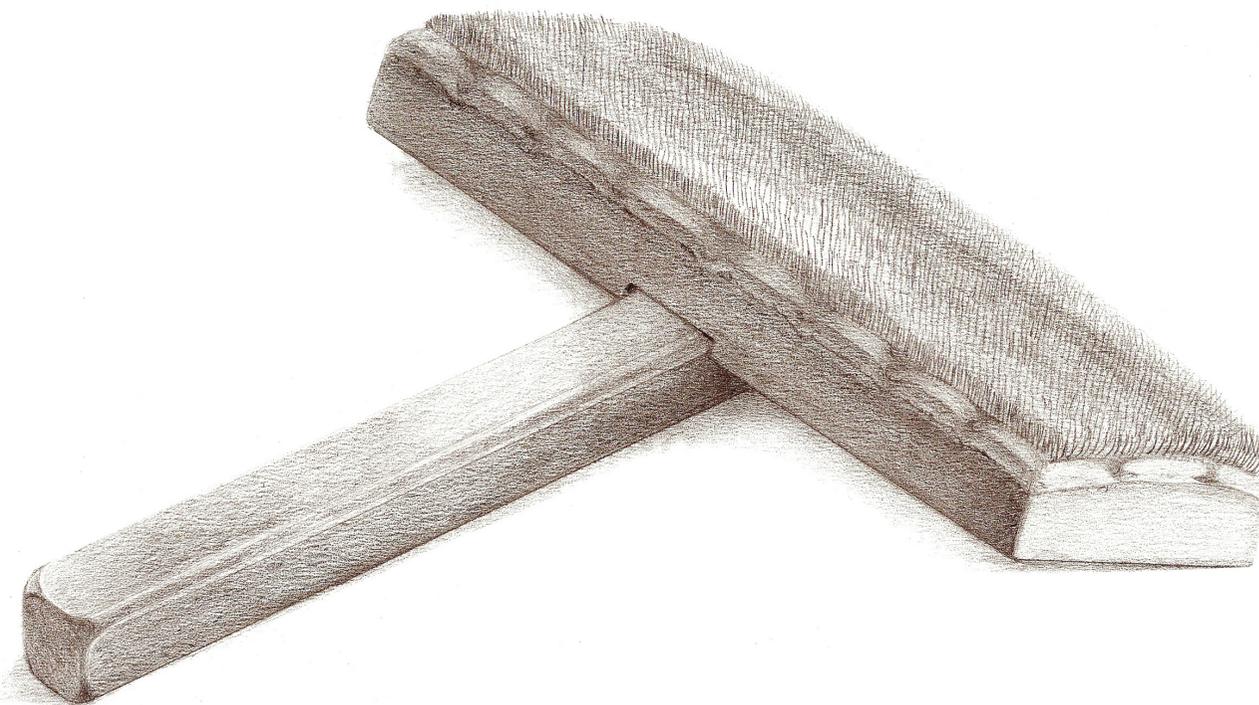




Processes for obtaining yarns

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Picture 1. Teasel for wool

1 Objectives

1.1 Didactic

- Knowing the basic principles of spinning
- Acquire the necessary skill in the hand spinning technique.
- Checking the increase of resistance produced by torsion.

1.2 Investigation and creation

- Experimenting different yarns with mixtures of fibres and other materials.
- Experimenting giving more or less torsion in the yarn and observing the different results in the twisting.

2 Theoretical introduction

Spinning is the group of operations that transform the textile material in a continuous thread.

The principal functions of the spinning of fibres are:

- Increase of the resistance of the thread: the spinning produces that the fibres get in contact and, consequently, they rub with each other increasing their resistance to traction.
- Obtaining continuous threads from discontinuous fibres making them more manageable and optimal, in the different textile processes.

To obtain thread from continuous filaments it would be enough just twisting them, but in the case of discontinuous fibres the following process would be needed:

- Carding: it takes its name after the “cards” that were used originally for this function. It consists basically



Picture 2. Torsion in S

in opening or separating the fibres, stretching them and placing them in parallel by combing them.

- Spinning: gather a group of fibres by a torsion (torsion in S, figure 2) to form a thread.
- Twisting: it allows to gather two or more threads (already spun called ends), by another torsion in the opposite direction (torsion in Z, figure 3).



Picture 3. Torsión en Z.

In the hand spinning are used the spindle and distaff. The difficulty of the spinning lies in making the thread of a uniform width and well twisted. An excess in torsion forces the breaking of the thread

It is important in the evolution of the spinning processes the spinning wheel. The medieval winding drum consisted of an spindle, horizontally held to a board and connected to a wheel by means of a belt. The wheel was

made to spin around its axle with the left hand, while the right hand was used to prepare the fibre. From the 15th and 16th centuries on some inventions appeared that originated new types of winding drum. Mainly the invention of a system of pulleys, flywheels and spools in connection with the big wheel spinning. In the mechanic spinning it is not possible to produce threads in an unique operation. First, it must be obtained a yarn (uniform distribution of the fibres), then with a light torsion a thick thread is elaborated and by subsequent takedowns and torsions, the desired fine and resistant thread.

Twisting the threads to a greater or lesser extent determines some of its features; a light torsion provides fabrics of a soft surface, while the threads that are highly twisted produce fabrics of a hard surface resistant to abrasion, and less prone to get stained and wrinkled; nevertheless, the fabrics made with highly twisted threads shrink more.

3 Materials, equipments and working tools

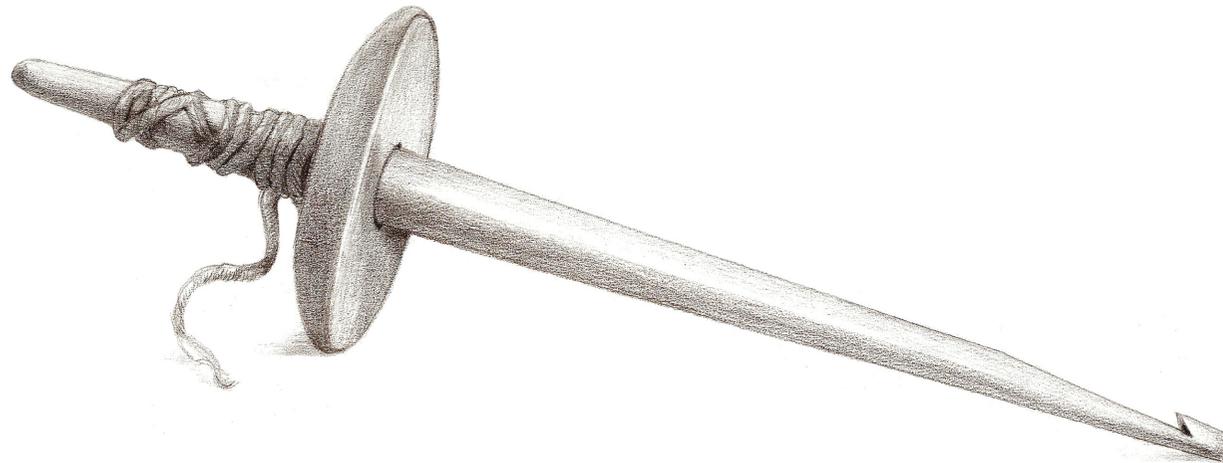
3.1 Materials

- 50 g of vegetal fibres: limb of linen.
- 50 g of animal fibres: sheepskin wool.
- 20 g of artificial fibres: rayon.
- 20 g of synthetic fibres: perlon.

- 1 newspaper.
- 1 plastic bin bag.

3.2 Equipments and working tools

- 1 pair of teasels. (See Figure 1.)
- 1 spindle. (See Figure 4.)
- 1 pair of scissors.



Picture 4. Spindle.

4 Experimental procedure

Students number: 1

Time: 4 hours.

Stages:

a) Carding

- I. Opening the fibres. Taking a small portion of fibres and opening them abirilas with the fingers without separating them completely.
- II. Placing the opened fibres in the teasel of the left hand.

III. Combing softly with the teasel of the right hand over the left hand, distributing the fibres over the teasel in parallel.

IV. Extracting the tuft of the carded fibre.

b) Spinning

I. Stretching with the fingers, extracting the beginning of the thread of the tuft and joining it to the thread of the spindle.

II. Making the spindle spin clockwise (torsion in S) with the right hand, holding firmly the fibres with the left hand.



Picture 5. Taking a small portion of the sheepskin.



Picture 6. Combing the wool.



Picture 7. Tuft prepared for spinning.



Picture 8. Placing the thread of the spindle.

- III. Making a stretch of the thread (approximately 30 cm.) and wind it in the centre of the spindle .
 - IV. Repeating the operation until obtaining the desired length.
 - V. Taking out the thread from the spindle making a ball.
- c) Twisting.
- I. Taking two balls of S torsion thread and joining their endings to the thread of the spindle.

- II. Making the spindle spin counterclockwise (torsion in Z) with the right hand, keeping firm and separated the two threads with the left hand. Making a stretch of the thread (approximately 30 m.) and wind it in the centre of the spindle.
- III. Repeating the operation until obtaining the desired length.
- IV. Taking out the thread from the spindle making a ball..

5 Safety and work specific norms

5.1 Safety and handling of equipments

Allergic reactions: some fibres may cause allergic reactions, so the teacher will previously ask the students about their allergy history, taking the appropriate measures (gloves, mask) if needed.

5.2 Waste management

The fibres waste will be kept for later practices.



Picture 9. Winding the thread in the spindle.

6 Instructions to elaborate the memory

The memory will contain the following:

- a) Front page
- b) Index
- c) Registration of results

Sampler: On the front part of the cardboard DIN A 5 format, the sample will be attached and in the back the data related to type of fibre or fibres, degree of torsion and any other relevant details that may apply. These cardboards are placed in order of completion. Each cardboard will include:

- a) At the front:
 - Sample of the fibres used kept in a small transparent bag with reversible closing .
 - Result of the spinning.
 - Result of the twisting.
 - Number of order of realization.

- b) At the back:
 - Fibre/s used, group to which they belong in the general classification of textile fibres.
 - Description of the spinning and / or twisting made.

d) Interpretation of results

Checking the increase of the resistance of the textile fibres in the spinning and in the twisting. For this:

- To a thread held in one of its ends a weight will be added in the other end until it breaks.
- Repeating the previous operation with the thread twisted to three ends.
- The necessary weight for the breaking of the thread a) it will be multiplied by three and will be checked that the result is less than the needed weight for the breaking of the three ends thread.

e) Bibliography and resources

7 Creative application

- Realization of creative spinnings using different fibres. Repeating the stages a, b and c, as mentioned in the experimental procedure, but in the stage of teasing (a) the opened fibres that will be placed, will be mixtures of different types. Thus, the direction of the turn could be varied (for example spinning a thread in S, another in Z and joining them with a torsion in Z), as well as the tensions of the twisting (for example, spinning a very twisted thread, another very little and joining them by a normal torsion)..
- Applying the knowledge and skills achieved in the realization of a spinning using plastic and/ or paper cut in strips, with the intention of a possible use. It must be specified in the project:
 - a) Materials.
 - b) Spinning or twisting.
 - c) Expected result.
 - d) Possible application.

Once projected, it is presented to the teacher for its revision and approval for its realization..

8 Complementary documentation

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HOLLEN, Norma / SADDLER, Jane. *Introducción a los textiles*. Limusa Moriega editores, México, 2004. ISBN: 968-18-1898-9.

LÓPEZ SOLER, M^a Carme. *Manual de tejidos*. Wuds World Editor, Barcelona, 2007. ISBN: 978-84-611-8614-3.

8.2 Related practices

- Fabricación de aglomerados: fibras celulósicas.
- Fabricación de aglomerados: fibras proteicas.

8.3 Multimedia resources

Videos of the practice.

Hand spinning.

Available in:

- 1 [http:// www.laboratoriodemoda.com](http://www.laboratoriodemoda.com)
- 2 [http:// fashionlaboratory.org](http://fashionlaboratory.org)

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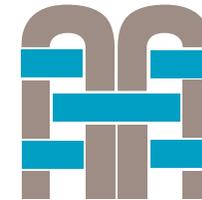
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**This study guide is part of a living process.
It is important for us to be open to the changes produced by its implementation.
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