



321en23

YARN AND ITS CONSTRUCTION

In the last lesson you have learnt that the basic unit of a fabric is fibre. Fibres are either staple or filament. The fibre, specially staple, is too weak to make a fabric. The treatment given to a fibre before it can be made into fabric, is discussed in this chapter.



OBJECTIVES

After studying this lesson you will be able to:

- define a yarn;
- explain the process of yarn making;
- elaborate the meaning and importance of blended yarn and cite examples of blends available;
- describe the yarn properties;
- state and classify the different types of yarn and their uses; and
- differentiate between a yarn and a thread.

23.1 YARN

You must have seen your mother knitting a sweater or you must have knitted one yourself. For this you use a long thread of wool. Untwist the thread and observe the waves. You will find that it is made of a bundle of small fibres. This thread made of fibres is called a yarn. Twisting the fibres gives the yarn length and strength. A yarn can either be a spun yarn (from staple fibres) or a filament yarn (from filament fibres). Can you now define a yarn? Yes you are right!





Yarn is an assemblage of fibres twisted together.

Both, staple and filament fibres are used to make yarn.

Staple fibres make spun yarn and filament fibres make filament yarns.

23.1.1 Yarn Making

Process of making yarn from fibres is called spinning.

- i) **For making yarn from staple fibres** - A bundle of fibres is taken, cleaned and straightened. After this they are pulled out and drawn and a twist is given to hold them together. This type of spinning is called mechanical spinning and is done for natural fibres like cotton and wool. The resultant yarn is a spun yarn.

You can try and make a yarn yourself. Take a ball of cotton and start pulling a few fibres, while pulling also twist the fibres. You will see that a yarn emerges because a number of small fibres are getting twisted with each other. This process of pulling the fibres and twisting them together is called spinning. You can spin using a takli (spindle), charkha (spinning wheel) or a spinning machine.

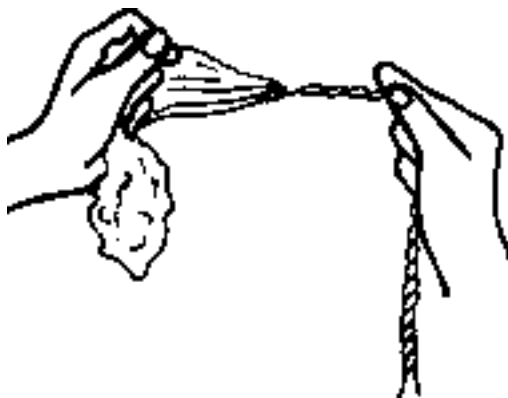


Fig. 23.1: Spinning by hand

- ii) **For making yarn from filament fibres** - The filament yarns are spun by the chemical spinning process. To understand this recall how a 'halvai' makes 'sevia'. He makes a dough of 'besan', passes it through holes into hot oil, the 'besan' takes the solid form of 'sevia'. The chemical spinning process is similar to this. A spinning solution of the raw materials is made and passed through the holes of a spinnerette (looks like a bathroom shower). The solution solidifies into thread like form called the filament fibre. These filament fibres are twisted together to form a strong and fine yarn.

23.2 BLENDS

You must have heard names like terrycot and cotswool. These are names of mixed fabrics and are made from more than one type of fibre. At the time when the spinning of yarn is being done, two types of fibres are mixed, pulled and twisted together to form a blended yarn. Can you say why two fibres are mixed together? Yes, two fibres are mixed together so that we can get the good properties of both



in one fabric. Cotton fibre is mixed with terelene to get terycot. Terycot has the comfort property of cotton and is easy to maintain like nylon. Similarly, wool or silk fibres are mixed with terelene to produce terrywool and terrysilk respectively.

Table 23.1 Commonly Available Blended Fabrics

Fabric (Blend)	Composition		
Terrycot	Terylene	+	Cotton
Cotswool	Cotton	+	Wool
Terrywool	Terylene	+	Wool
Cotton Silk	Cotton	+	Silk
Woolacrylic	Wool	+	Acrylic



Activity 23.1

Visit your neighborhood cloth shop. Find out all the blends that are available. Record your observations in your record book.

S.No.	Blends available	Composition



INTEXT QUESTIONS 23.1

- Fill in the blanks using the letters in the treasure chest. Each letter can be used more than once.

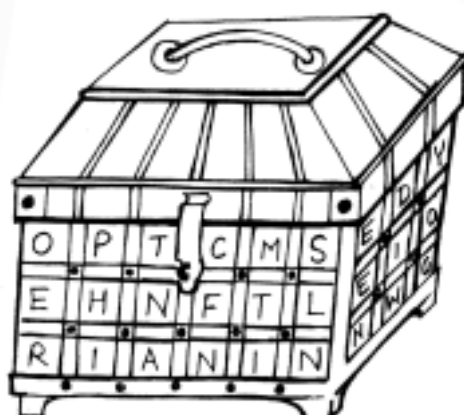


Fig. 23.2

Notes



- i) Chemical spinning involves making a solution, passing the solution through a and into fibre form.
- ii) Spinning can be done using a spindle, or
- iii) Spun yarns are made from fibres and filament yarns from fibres.
- iv) Two types of blends are and

23.3 YARN PROPERTIES

In the previous lesson we had discussed the properties of different fibres and how they influence the behaviour of fabrics. Properties of yarn also have an effect on the behaviour of the fabric.

The two important properties of a yarn are its *fineness* and the *amount of twist* it has. These two properties of the yarn are related to each other. More the twist in a yarn, the finer, smoother and stronger it is. Do you remember the exercise of making a yarn - the more you pull out the fibres and twist them, finer the yarn becomes.

However, if a yarn is highly twisted it gives the fabric a crinkled effect.

Such high twist yarns are called *crepe* yarns and are mainly used to make fabrics for dupattas.

23.4 TYPES OF YARNS

On the basis of their structure, yarns are broadly classified into three types:

- i) Simple yarns ii) Complex/Novelty yarns iii) Textured yarns

i) Simple Yarns

A yarn which is smooth and uniform and evenly twisted is called a simple yarn. It is commonly used for making fabric like poplin and cambric. Simple yarns are further classified into three types.

A simple single yarn is an assemblage of fibres evenly twisted together.

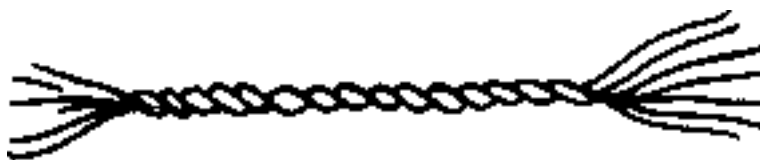


Fig. 23.3 : Simple single yarn

A Simple Ply yarn is made of two or more singles evenly twisted together. If the ply has two singles it is called a 2-ply and so on. This type of yarn is found

in a 2 by 2 rubia fabric. It has 2 ply yarns in both directions of the fabric.



Fig. 23.4: Two Ply yarn

Similarly, 3 ply yarns or 4 ply yarns are also available.



Fig. 23.5: Three Ply yarn



Fig. 23.6 : Four Ply yarn

A simple cord yarn is made of two or more ply yarns twisted together. To see a cord yarn, take a clothes line used for drying clothes and untwist it.

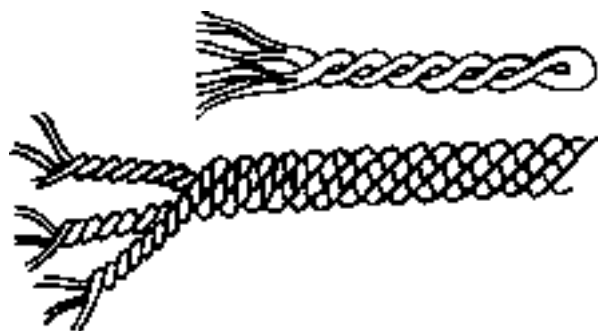


Fig. 23.7

Making a cord yarn : Take two or more ply yarns. Twist them together. It will make a cord yarn.

ii) Complex/Novelty Yarns

A yarn which makes a fabric is not always smooth and uniform. Just unravel a 'Khadi' fabric and see the yarns that make it. You will see that these yarns are not even, but are thick in some places and thin in the other. Such yarns are known as Complex yarns. Complex yarns are the uneven yarns which may be thick and thin or have curls, loops, twists and even differently coloured areas along their length. Due to this fancy look of the yarns they are used to add interesting effects in fabrics. Like simple yarns, the complex yarns may also be single or ply.

A single complex yarn is usually unevenly twisted to make it thick and thin in places. This is the type of yarn which is found in the 'Khadi' fabric.



Notes



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Before discussing the complex ply yarns, recall that a ply yarn is made of two or more single evenly twisted yarns. In complex ply two or more complex yarns are twisted around each other to form loops, curls and knots to create fancy effects. Many knitting yarns are complex ply yarns which give interesting textures on sweaters.

Another type of yarn that you all must have seen is a Core yarn. Just pull out the elastic from one of your old socks. You will see that this elastic has been wrapped by another yarn of cotton or nylon. Such a yarn is called a Core Yarn and is classified as a Novelty Yarn. Some examples of complex and novelty yarns are illustrated below along with their descriptions.



Fig. 23.8 : (a) SLUB yarn with thick and thin places



Fig. 23.8: (b) SPIRA or GIMP- combination of soft, thick yarns twisted with fine, hard yarns



Fig. 23.8: (c) BOUCLE- two different yarns are fed into the loom at different speeds for a varied effect



Fig. 23.8: (d) LOOP – stiff fibres form loops which spring out of the core yarn



Notes

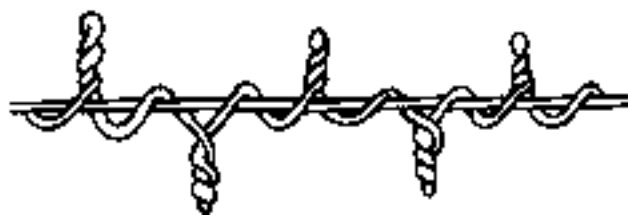


Fig. 23.8: (e) SNARL – very highly twisted yarn



Fig. 23.8 : (f) KNOP – ground yarn is held under tension as knops are built up a fast speed



Fig. 23.8 : (g) CHENILLE – a woven cut fabric yarn

iii) Textured Yarns

When you unravel a sweater, you find that the yarn which was straight when you knitted has now become curly. This yarn can now be called a textured yarn.

What is texturizing?

Texturizing is a treatment usually given to a manmade filament, after which it becomes curly or acquires some forms of loops, coils or crimp.

Hence after being textured, a smooth filament will have any of the following textures:

Do you recall the properties of manmade filaments like nylon and polyester from the previous lesson? Yes, they are smooth, slippery, light in weight and have a low absorbency.

Hence fabrics made from simple filament yarns are uncomfortable to wear. When such filament yarns are textured they look denser, become bulky, and more stretchable. Due to their changed texture, spaces are created between yarn. This makes the fabric breath better and become more absorbent and therefore comfortable to wear.

To see a textured yarn, pull out a yarn from your nylon socks. You will see that this yarn is fluffy, soft, stretchable and looks denser than an ordinary nylon yarn.



Notes



Fig. 23.9 : (a) Coiled



Fig. 23.9 : (b) Peaked Crimped



Fig. 23.9 : (c) Rounded Crimped



Fig. 23.9: (d) Curled

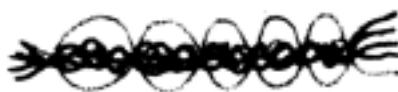
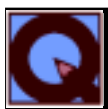


Fig. 23.9 : (e) High bulk – stretched and relaxed

Thread and Yarn

You must have used the terms thread and yarn interchangeably many times. Actually a thread and yarn are similar but not the same. A yarn is processed further to make a thread.

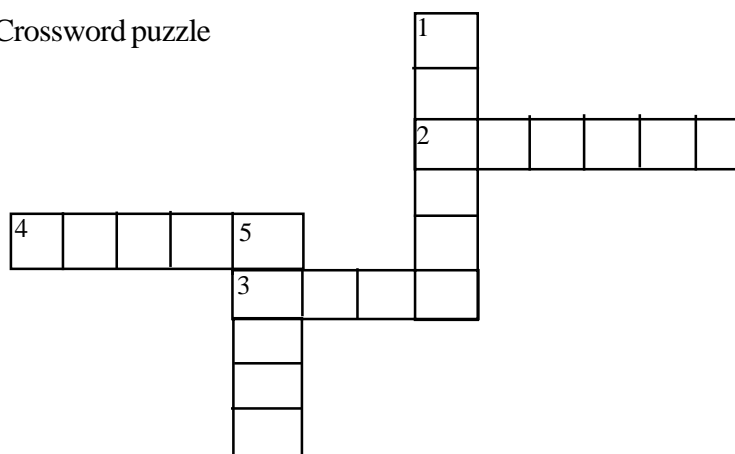
A thread is usually a ply yarn, it is finer, more even and stronger.



INTEXT QUESTION 23.2

1. Differentiate between the following–
 - i) Single yarn and ply yarn.
 - ii) Cord yarn and core yarn.
 - iii) Complex yarn and Textured yarn.
 - iv) Thread and yarn.
2. Justify the following statements giving examples where ever applicable.
 - i) A high amount of twist brings in the crinkle effect in the yarn.
 - ii) Complex yarns give fancy effects in fabrics.
 - iii) Complex yarns are uneven in their diameter.
 - iv) Thread is not the same as yarn.

3. Crossword puzzle



Clues:

Down

1. Fibre good for undergarments
5. Strongest manmade fibre

Across

2. Strong, finely twisted yarn
3. Group of fibres
4. Manmade cellulosic fibre



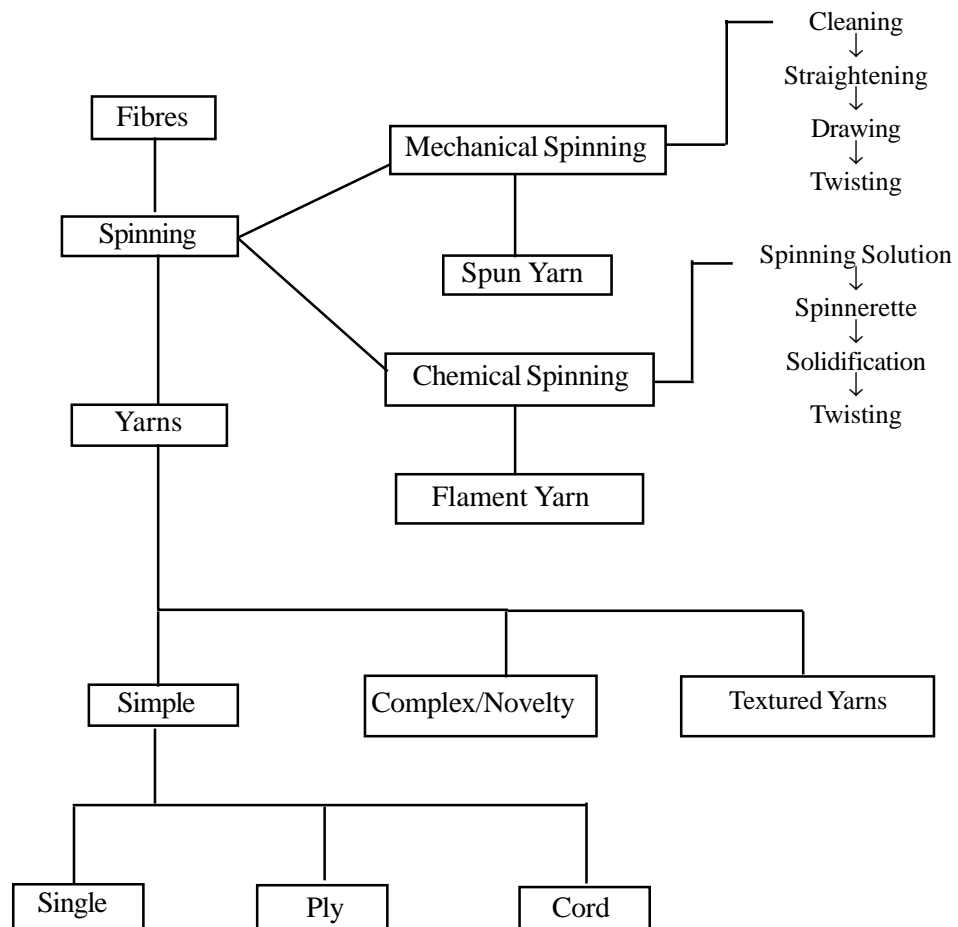
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WHAT YOU HAVE LEARNT



TERMINAL EXERCISES

1. How will you define a yarn?
2. Explain the process of making yarns from staple fibres.
3. Why are fabrics made from textured yarn more comfortable to wear?
4. Which additional properties make a yarn into a thread?
5. What kind of properties will you look for when you purchase “terewool fabric”?



ANSWERS TO INTEXT QUESTIONS

- 23.1** 1 (i) spinning, spinnerette, solidifying.
(ii) Spinning wheel, spinning machine.
(iii) Staple, filament
(iv) Cotswool, terycot.
- 23.2** 1. Refer to text
2. Refer to text
3. 1. cotton 2. thread 3. yarn 4. rayon 5. nylon.

AUDIO

Blends and their usefulness

VIDEO

A film on yarn making

For more information
<http://www.fabriclink.com>
<http://www.allfiberarts.com/cs/dyeinfo.htm>

MODULE - 5

Textiles and Clothing



Notes