LESSON 6  PRODUCTION OF FANCY YARNS

STRUCTURE

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6. **MANUFACTURE OF FANCY YARNS AND THEIR STRUCTURE**

In lessons 4 and 5 of this unit, you were introduced to the manufacture and structure of staple and filament yarns respectively. In this final lesson of the unit, another important and interesting class of yarns, viz fancy yarns will be described. There is a great variety of these decorative yarns and they differ in structure, appearance and method of manufacture compared to the earlier two classes of yarns. Some characteristics of these yarns will be covered in this lesson.

6.0 **Objectives**

After going through this lesson, you will be able to understand

- What are fancy yarns.
- How are fancy yarns made.
- The various interesting structures that can be given to fancy yarns.
- The uses of fancy yarns.

6.1 **Introduction**

Fancy yarns are based on both natural (cotton, wool and silk) and man made fibres and filaments or their blends. In these yarns irregularities like nep, knots, loops and snarls of different size and shape are arranged with varying distance between them. Fancy yarns are used in a variety of applications. Fabrics containing fancy yarns are used for many textile purposes, for instance apparel fabrics or household textiles such as curtains and upholstery.

6.2 **Structure of Fancy Yarns**

Fancy yarns are produced with a multiplicity of structural features but the structure of a fancy yarn may be considered in terms of the following three basic components (Fig. 6.1).

1. The base or core yarn
2. The fancy effect yarn
3. The binder yarn

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Fig. 6.1 Basic parts of a fancy yarn (Taken from Reference 1)
The fancy effect yarn is wrapped around the core yarn to form the design. The binder yarn holds the effect yarn in place on the base to prevent it from slipping while it is being wound, woven or knitted. Generally fancy yarns contain at least two of these features.

### 6.3 Some Examples of Fancy Yarns

All fancy yarns may be classified into three groups:

1. **Knotty yarns**
2. **Simple and fancy spiral yarns**
3. **Loopy yarns**

Most fancy yarns are produced in two stages. First, an unsupported fancy yarn is produced on a fancy yarn twister and next it is assembled and twisted with a binder yarn so that the effects such as knots, loops etc. are locked on the core yarn. Some types of fancy yarns are shown in Fig. 6.2.

![Fig. 6.2 Some typical fancy yarns](image)

(a) knotty yarn  (b) sponge type yarn  (c) simple spiral yarn  (d) fancy spiral yarn  (e) looped yarn
Self-check Questions

1. Define a fancy yarn.

2. What are the three components of a fancy yarn and what are their functions?

3. Name the three groups into which all fancy yarns can be classified.

6.4 Manipulation of Fibre Characteristics

The fibre being the smallest unit of the fancy yarn, manipulation of fibre characteristics is often resorted to to create fancy effects. The type of fibre used, its length, denier, cross-sectional shape, crimp, color, luster, affinity for dyes, shrinkage, etc. can be used to advantage. For example, two or more fibres having difference in some of these characteristics can be manipulated to produce fancy effects.

The fibres that produce fancy effects (see Fig. 6.1) can be chosen from a very wide range which includes natural fibres like ramie, flax, jute, mohair, angora wool, etc. Man-made fibres like bright nylon, acrylic fibres with differential shrinkage characteristics, trilobal polyester, bright viscose, triacetate and cuprammonium rayon can also be used. These fibres are generally short and coarse since it is only then that they are brought on to the surface of the fancy yarn during production. Some of these special fibre types are imported.

An appealing effect can also be created by blending fibres having different dyeing affinities. For example, cationic dyeable polyester, when combined with normal polyester, can be converted to products which on dyeing give attractive colours, contrast and fancy effects. Similarly in acrylic fibres differential shrinkage is used as a tool to create fancy effects. Use of large fibre length differential can lead to production of yarn with distributed spots or slubs of varying dimensions.

Self-check Questions

4. Name the different classes of fibres which find use for making fancy yarns

6.5 Manipulation of Yarn Characteristics

Manipulation of fancy yarns often involves plying and cabling together yarns of varying linear density and twist levels. Many subtle and unique effects can be created through manipulation of these characteristics. Corkscrew and spiral yarns can be produced by combining yarns with appropriate differences in
individual yarn fineness. If the direction of twist component is kept different, the plying operation will produce an unbalanced twist spiral yarn. Cable twisting of two or more unbalanced twisted spiral yarns in a direction opposite to that of ply twist produces mock chenille yarn. This yarn is cabled with a binder thread in the opposite direction to produce a yarn having semi circular loops around the core.

Self-check Questions

5. How can subtle and unique effects be created by manipulation of yarn characteristics in fancy yarn?

6.6 Production of Fancy Yarns

There are three methods used for producing fancy yarns: ring twisting, wrap spinning and a combination of ring twisting and wrap spinning. Detailed descriptions of these methods appear in references 1 and 2.

6.6.1 The twisting method

In the ring twisting method, twisters with special attachments for producing different tensions and rates of delivery in different placements are used.

A great variety of fancy yarns are made by twisting together two or more threads which are different in thickness, color and softness. Special effects and variety are produced with the help of special mechanisms that can be set to regulate the feed of different threads used in their manufacture.

Fancy yarns are produced in several ways. They can be made either by blending differently colored fibres and spinning them as one yarn or by adding to the initial material, small neps of coloured fibres or short length pre-dyed fine yarn pieces.

Some yarns are also formed by one thread snarling up, or having lumps, thick / thin places, loops and knots. Most of the fancy yarns are produced on fancy doublers equipped with different mechanisms. It can be used as an ordinary doubler too if no fancy yarn is to be produced.

6.6.2 The wrapping method

Wrap spinning (see Ref. 1) makes use of a conventional roller drafting system. A sliver fed into it is converted to a yarn and is guided through a rotating hollow spindle. The wrapping yarn or binder is fed over another roller and placed above the spindle and is wound onto the spindle. It is fed through the center of the spindle with the drafted fibres. Boucle and knop yarns are produced by wrap spinning (fig 6.3).
Different types of wrapped yarns are shown in Fig. 6.4.

6.6.3 Wrap spinning and ring twisting

The initial yarn viz. the fancy effect and core yarns are produced on the fancy hollow spindle spinner. A further doubling operation on a ring twister secures or binds the fancy effect yarn to the core yarn some of the widely used fancy yarns will now be described.

Self-check Questions

6. Name the three methods for producing fancy yarns.
6.7 Some Widely Used Fancy Yarns

i) **Spiral yarn:** It is made by twisting a thick soft yarn around a fine yarn giving an effect of a spiral (Fig 6.5). While twisting, the rate of feed of the soft thick yarn is usually more than that of the other which is given a hard twist.

![Fig. 6.5 Spiral yarn](image)

ii) **Knot yarn:** During the process of doubling of two threads which are individually controlled, one thread is made to stop momentarily while the other thread is continuously fed. In this process, the second continuous thread coils round the other thread as a hard spot, knot or lump (Fig. 6.6). By suitable mechanical adjustments these knots can be made at regular intervals or at random intervals.

![Fig. 6.6 Knot yarn](image)

iii) **Loop or Curl yarn:** In this yarn the loop forming thread gives prominent loops or circular ring shapes along the length of the yarn (fig-6.7). It has a fine foundation thread and soft spun thick thread, which forms loops at regular intervals by being rapidly given in during the twisting operation. The loops are held in position by a fine binder thread.

![Fig. 6.7 Loop yarn](image)

iv) **Snarl yarn:** This is similar to loop yarn except that the looping yarn has high twist so that the loop turns into a snarl (Fig. 6.8).

![Fig. 6.8 Snarl yarn](image)
v) **Nep yarn:** This yarn is usually made from two threads twisted together and small pieces of plain or colored roving is introduced at intervals to form flecks or naps which lie more on the surface of the yarn to give the novelty appearance.

vi) ** Flake yarn:** The flake yarn is made by using a colored ground thread, which has large patches or flakes of colored roving well twisted.

vii) **Grandelle yarn:** Grandelle yarn is very common in many of the textile mills. This is prepared by twisting together two or more differently colored threads. Usually contrasting colors are selected for greater prominence of the Grandelle effect.

![Fig. 6.9 Grandelle yarn](image)

viii) **Chenille yarn:** For preparing chenille yarn a central core of threads is used to hold fibres projecting all around. It looks like having fur on the yarn body. (Fig. 6.10)

![Fig. 6.10 Chenille yarn](image)

ix) **Cloud yarn:** This is produced by twisting together two fine threads with portions of thick soft roving which are introduced at intervals during the twisting operation. The yarn delivery speeds are so regulated that the two threads are entered rapidly when the roving is being introduced so as to give less twisting at that portion.

x) **Textured looped yarns:** As described in the previous lesson textured yarns are produced to give the filament yarns a more open texture and their openness makes the fabrics comfortable. Looped textured yarns may be given the appearance of a fancy yarn with alternating bunches of loops. For this, the leading mechanism must be periodically engaged and disengaged at regular and very short intervals and as a result straight portions of textured yarns will alternate with looped ones. The exterior appearance of looped textured yarns is illustrated in Fig. 6.11.
Self-check Questions

7. How is the snarl yarn similar to the loop yarn?

8. What is the structure of a fancy textured yarn?

6.8 Characteristics and Properties of Fancy Yarns

As would be expected from their construction and texture, fancy yarns are not hard-wearing if used alone and so are usually combined with straight hard-wearing yarns. As fancy yarns are more expensive to produce, this also helps to reduce costs.

In weaving, heavier fancy yarns are used only in the weft because they tend to unravel in the warp due to the stresses present and also due to movement of headles or reed during weaving. Fine fancy yarns can be used in warp as they pass easily through the loom.

Fancy yarns have a major effect on fabric performance. Some noteworthy points in this context are listed below:

i) They seldom add strength to the fabric.

ii) Fancy yarns being weak, they give sensitivity to the fabric for abrasion damage. The durability of fancy yarn fabric depends on, how well the fancy yarns are held in the fabric structure. The smaller is the novel effect, the more durable is the fabric.

iii) Use of fancy yarns adds warmth to the fabric.
iv) Fancy yarns increase absorbency of fabrics because of surface area increase.

v) Novelty yarns lead to production of lint in the fabric.

### 6.9 Assignments

#### 6.9.1 Class Assignments

i) Briefly describes one method of producing fancy yarns.

ii) Sketch five major fancy yarns and briefly describe them.

#### 6.9.2 Home Assignments

i) Locate some fabrics in the market which contain fancy yarns. Reorganize the fancy yarn types used in these fabrics.

### 6.10 Summing Up

Various aspects related to fancy yarns have been covered in this lesson. These include brief descriptions of the production routes, the construction and texture of the major fancy yarns and the characteristics, purpose and applications.

### 6.11 Possible Answers to Self-check Questions

1. A fancy yarn can be defined as one that differs from the normal construction of a single or doubled yarn by deliberately introducing irregularities in its construction.

2. The three components of fancy yarns and their functions are:
   
   i) A base or core yarn, around which the yarn to create fancy effects is wrapped.
   
   ii) The fancy effect yarn, which forms the fancy effect, and
   
   iii) The binder yarn which holds the effect yarn in place.

3. Fancy yarns may be classified into the three following groups:
   
   (a) Knotty yarns (b) Simple and fancy spiral yarns and (c) Loopy yarns

4. The fibre classes which find use in making fancy yarns are: natural fibres like ramie, flax, jute, cotton, mohair, Angora wool, silk etc. And man made fibres like bright nylon, acrylic fibres with different shrinkage characteristics, trilobal polyester, bright viscose, triacetate and cuprammonium rayon.
5. Plying and cabling together yarns of varying linear densities and twist levels can create many subtle and unique effects in fancy yarns.

6. The three methods for producing fancy yarns are ring twisting, wrap spinning and a combination of wrap spinning and ring twisting.

7. The snarl yarn is similar to the loop yarn except that the loop yarn is given a high twist so that the loop turns into a snarl.

8. In a fancy textured yarns, straight portions of textured yarn alternate with looped yarns at regular and very short intervals.

6.12 Terminal Questions

1. Write an essay on fancy yarns.

2. What effect do fancy yarns have on performance of fabrics containing these yarns?

6.13 References and suggested further reading


6.14 Glossary

1. Weaving The action of producing fabrics by interlacing of warp and weft threads.

2. Warp Threads lengthways in a fabric as woven.

3. Weft Threads width ways in a fabric as woven.

4. Ramie A fibre removed from a perennial shrub grown in hot, humid climate.

5. Trilobal shape Refers to a three-sided fibre cross-sectional shape that is designed to give a twinkling effect.