

Rajasthan Public Service Commission, Ajmer

100

Expert Validation of Answer Key

Name of Examination Lect. C.D.D.M Exam 2014

Name of Expert 1 [Signature]

(with Post & Contact no.) 2 [Signature]

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
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11	Delete	
22	Delete	

Additional Remarks :-

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2
101

Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1

(with Post & Contact no.) 2

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
24	3	—
25	3	PROOF ENCLOSED
33	4	—

Additional Remarks :-

Signature



Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1

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Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
45	Delete	_____
51	1	_____
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Additional Remarks :-

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103⁴

Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1
2

(with Post & Contact no.) 2

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
53	Delete	—
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Additional Remarks :-

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5
104

Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1
2

(with Post & Contact no.) 2

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
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Additional Remarks :-

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105⁶

Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1

(with Post & Contact no.) 2

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68	1	—
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106

Expert Validation of Answer Key

Name of Examination LECTURER CDDM EXAM 2014

Name of Expert 1 MRS. K.K. KUNJI & MRS. KOMAL SAHNI
 HOD CDDM SV. LECTURER CDDM

(with Post & Contact no.) 2 9460481610 9413224975

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
76	4	PROOF ENCLOSED
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Date

Expert Validation of Answer Key

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Name of Expert 1 [Signature]

(with Post & Contact no.) 2 [Signature]

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
83	4	PROOF ENCLOSED
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Rajasthan Public Service Commission, Ajmer

108

Expert Validation of Answer Key

Name of Examination

Name of Expert 1

(with Post & Contact no.) 2

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
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87	Delete 2 Page 158	PROOF ENCLOSED
89	3	PROOF ENCLOSED

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Date

Rajasthan Public Service Commission, Ajmer

Expert Validation of Answer Key

Name of Examination Lecturer C.D.D Exam 2014

Name of Expert 1

(with Post & Contact no.) 2

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
85	4	Proof enclosed
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87	2	PROOF ENCLOSED

Additional Remarks :-

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Date

Rajasthan Public Service Commission, Ajmer

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Expert Validation of Answer Key

Name of Examination UPPER CANTON EXAM

Name of Expert 1 [Signature]

(with Post & Contact no.) 2 [Signature]

Question No. (Series A)	Answer	Remarks/References (Use proper arguments or references in support of your answers)
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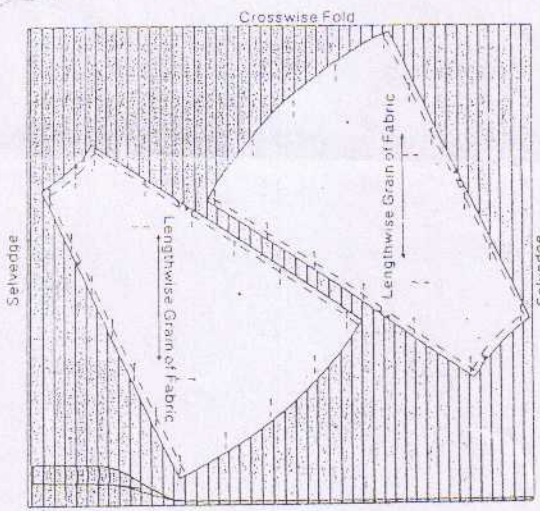
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110



Small checks

Checks 6 cm (1/4 inch) or more in size *must* be matched; smaller checks are more attractive when matched.

Florals, Prints and Jacquards

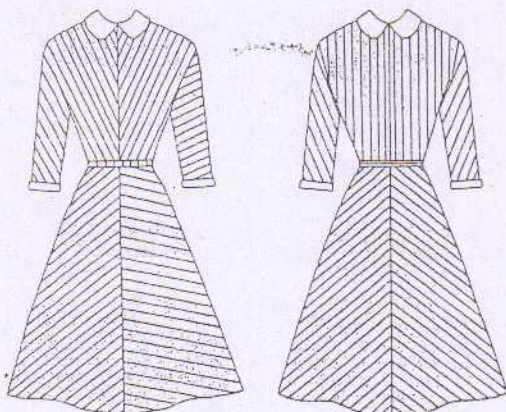
Many floral fabrics have an 'up' and 'down' to the motif, and when they do, you must lay all pattern pieces in *one direction*.

To achieve a pleasing effect with medium or large motifs, make sure that they fall above the bustline instead of directly over it, approximately in the same position in the front as in the back, and in the same place on each sleeve. Match at the seamline whenever possible.

As with checks, avoid patterns that require many seams within the bodice and skirt. Simple lines are most suitable for prints, both large and small.

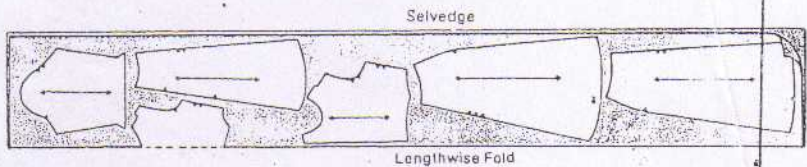
If the garment is cut on the bias, choose a pattern with a centre seam or opening in the front and back and follow these rules:

1. Fold the full width of the fabric on the crosswise grain, right sides together.
 2. Lay the pattern with the grain line parallel to the selvedge. Notches that are to be joined together must be on the same stripe. Stripes must be matched at side seams and centre seams or centre openings. Match at the *seamline*, not the seam edge.
 3. During dress construction, slip-tack all seams.
- When the stripes are *uneven*, lay the pattern pieces on the fabric in *one direction*.



Pile Fabrics

Pile fabrics such as velvet, velveteen and corduroy should be cut with the pile standing up to emphasise the rich dark tone. To determine the direction of the pile, brush the fabric with the fingers. If the surface is smooth, you are brushing with the pile; if rough, you are brushing against the pile. Use the 'rough' direction for the top of your pattern layout; and lay all pieces in the *same direction*, following the 'with nap' instruction guide with the pattern. Use fine needles to pin the pattern to the fabric.



component of sunlight, absorb the ultraviolet light and convert it to light in the blue region of the solar spectrum. This reflected blue light makes white textiles look whiter. The detrimental effects on the polymer system of a fibre and on dye molecules during prolonged exposure to sunlight may be mainly attributed to ultraviolet light waves. This is borne out by the fact that fibres and dyes have a better resistance to the effects of sunlight if they are exposed to it behind glass; glass filters out or absorbs most of the incident ultraviolet waves from sunlight.

Infrared radiation

The term *infra* means below or further on. In other words, the infrared waves are at the 'red' end of the visible light spectrum (see Fig. 8.1 and Table 8.1). Although essentially invisible, infrared waves extend the heat energy radiated by the visible light band. In fact, a significant portion of the heat experienced during exposure to sunlight is due to the invisible infrared radiation. Infrared waves, like ultraviolet, also penetrate clouds. Thus, even on overcast days, outdoor exposure of textiles subjects them to the effects of ultraviolet light assisted by the heat energy provided by infrared radiation.

What is colour?

Colour is a sensation which occurs when light enters the eyes. Light waves enter the eye and are focused on the retina by the lens of the eye. A photochemical reaction occurs which results in impulses that are transmitted along the optic nerve to the brain. The colour which is observed, perceived or experienced by the brain is dependent on the particular wavelength or combination of wavelengths of the light source.

If a textile material is examined in white light the material has a particular colour. This colour occurs because the textile material will absorb all the light falling upon it, and reflect only the wavelengths of its colour. Thus, a white fabric appears white in white light because it reflects all the light waves. However, a green fabric appears green in white light because the dye on the fabric absorbs most of the light and reflects only light with wavelengths which appear green to the eye. There are different greens because the reflected light is composed of different wavelengths which depend on the type of dye, amount of dye and structure of the textile material.

The green fabric when viewed under green light will appear green because most of the incident green light is reflected. On the other hand, if the green fabric is viewed under any light source other than white or green the fabric will appear black. This occurs because the green fabric will absorb nearly all the light that is incident on it and hence the light is not white or green, very little light will be reflected and the fabric will be seen as black. Any coloured fabric which is viewed under light which is not white or the particular colour of the fabric will also appear black.

Specifying colour

There are three terms which are used to describe and specify colour.

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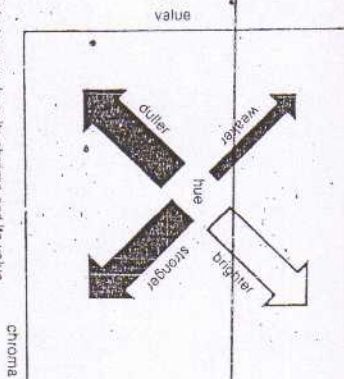


Figure 8.2 The relationship between a hue, its chroma and its value

1 Hue is the common name of the colour; for example, pink, mauve, scarlet, beige, tan.

2 Value is the term used to describe lightness, darkness, tone or shade of the hues. A colour is termed light in value when it approaches white and dark in value when it has a deep colour or approaches black.

3 Chroma is the term used to describe depth of colour; that is, the dullness, brightness, saturation, intensity, vividness or purity of the colour. A bright, intense colour is said to have much chroma whereas a dull colour is said to have little chroma. (Note: Chroma is from the Greek for colour.)

Figure 8.2 illustrates the relationship between a hue and its value and chroma. These terms and Fig. 8.2 will be easier to understand if you can examine the colour cards available from most paint manufacturers. The pastel colours of the brilliant gloss paints will be placed toward the top-right of Fig. 8.2 as they are very bright, light colours. The dark colours of the brilliant gloss paints will be placed in the lower right-hand corner of Fig. 8.2 as these are very bright, strong colours.

The pastel colours of the flat plastic paints would be placed toward the top left corner of the figure as these colours are dull and tend toward white. The darker colours of the flat plastic paints will be placed in the lower left hand corner as these colours are strong but dull.

Perception of colour

The perception of light and colour is part of one of the five human senses and occurs when light focuses on the retina and initiates a photo-chemical reaction in the retina. This reaction results in the sensation of colour.

The retina has two distinct types of nerve cells which are called cones and rods (see Fig. 8.3).

Cones are nerve cells which convey the sensation of colour to the brain. Cones are

weave, the design is stitched into the fabric by needles that operate at right angles to the construction. Thus, the lappet weave is very similar to embroidery.

The lappet design is made with one continuous additional yarn carried on the back of the fabric from one design to the next. The floating threads on the back may be cut away when the fabric is completed, but the ends are fastened securely and will not pull out easily. Therefore, fabrics made with the lappet weave are superior to similar ones made with the swivel weave.

Fabrics in the Lappet Weave. The lappet weave is employed on a variety of fabrics where novelty patterns are desired.

Dobby Weave

The doobby weave is a patterned weave used to construct designs that cannot be produced by the plain, twill, or satin weaves. The designs are simple, limited in size, and usually geometric in form. They are found in shirts and tie fabrics. The doobby weave is created on a plain loom by means of a mechanical attachment, called a *dobby* or *cam*, which raises or lowers as many as twenty-four to forty harnesses containing the series of warp yarns that form the pattern (see Figure 4-33). Although a large number of harnesses is used in this construction, the design is always small and does not make use of long floats. The most familiar type of doobby weave is bird's-eye, the small diamond pattern made with short floats that give the impression of an eye.

Fabrics in Dobby Weave. Fabrics made with a doobby weave are generally of spun yarn and of medium-weight. They may have a rough or pebbly surface imparted by the particular design. Typical fabrics

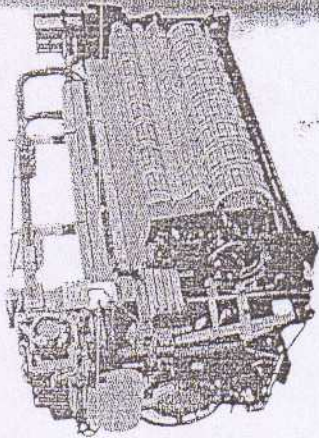


Figure 4-33 A loom with a doobby attachment. Note the punched pattern indicator control on the left for the doobby movement to obtain the desired design to be woven into the fabric. (Courtesy Crompton & Knowles Corporation)

are bird's-eye, huckaback, and granite cloth.

Jacquard Weave

In any of the weaves that have been described, the number of harnesses determines the construction. For example, two harnesses are required for the plain weave, three or more for the twill, and five to twelve for the satin weave. As many as forty can be manipulated by the special attachment of the doobby. The doobby designs are not intricate, however. They are limited to straight lines, edges, steps, or small circular lines.

For curves, swirls, and large-sized figures, it was necessary to devise a different mechanism that would allow an unlimited range of intricate designs. This need is met by the Jacquard attachment, named after its developer, Joseph Marie Jacquard, a Frenchman. The Jacquard mechanism controls thousands of needles, which lift one or more warp yarns independently of others without the use of

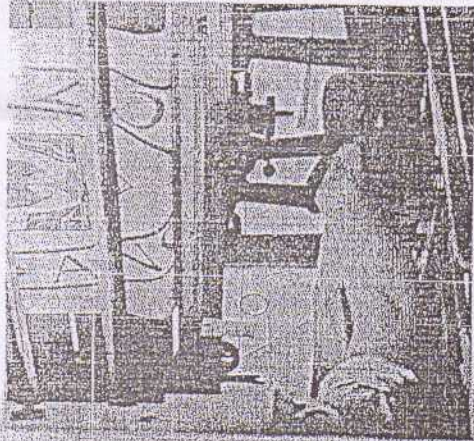


Figure 4-34 The card puncher has a paper design figure him. Following a line of checks across the design paper, he inserts steel punches in the cards specified on the paper design. Each hole in the card controls the loom mechanism that raises the desired warp yarns in the fabric surface, thus producing the weaving design. (Courtesy Textile World)

harnesses. Its action is similar to that of the player piano, where each note is governed by a hole on the music roll and is sounded when the hole passes over a certain opening.

The Jacquard design is first worked out on squared paper. Cards are then perforated to correspond with the design; they are laced together, looking somewhat like a chain of punched data processing cards, and placed in the Jacquard attachment (see Figure 4-34). The moving cards pass over a battery of needles mounted on top of the loom. Each needle controls a string, which, when released, picks up the heddle to which it is attached. The perforations on the cards allow the needles to drop through, and lift cer-

tain strings, which, in turn, lift single heddles independently of others (see Figure 4-35). The preparation of a Jacquard weave is the most expensive part of its construction. Setting up the loom may take several weeks or months; but once set, the pattern to be produced can be used and reused for different materials. This is the most expensive form of weaving. However, computerized versions now permit patterns to be programmed, readily modified, and stored, which facilitates operations.

Floats are inevitable in the Jacquard weave because of the elaborate designs. As in the satin weave, long floats may affect the wearing quality of the fabric; also, long yarns exposed to friction cause lint. Compact construction of the fabric, however, offsets the tendency to friction and wear. The consumer should select accordingly when purchasing fabrics having the Jacquard weave, especially damask table cloths which receive hard wear and repeated washings.

Fabrics in Jacquard Weave. The Jacquard weave is used in light, medium-, and heavyweight cloths made of spun and filament yarns to produce a range of decorative fabrics including brocade, brocatelle, damask, matelassé, and tapestry (see Figure 4-36). Depending upon the yarn, pattern, and weight, they are used for such apparel as dinner jackets and evening gowns and for such home furnishings as table cloths, drapery, and upholstery.

DISTINGUISHING WARP AND FILLING

Persons who deal with fabrics, as well as the home sewing consumer, must be able to identify the warp and the filling yarns, because the direction of the warp determines the way in which the fabric should

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112

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The salt. If such garments are not washed frequently, the iron compounds built up on them, and the back preparation that they have absorbed, may be liable to deteriorate while in storage.

Just knowing that a fabric is washable is not enough information for good results in laundering. The consumer must be acquainted with the proper method of washing each type of garment and fabric. Before any attempt is made to wash clothes, colored fabrics should be separated from white ones, and heavy work-clothes from fine and delicate pieces, as different washing methods are necessary. Insofar as possible, bad stains should be removed before the fabrics are immersed in hot water to reduce the possibility of setting.

Soaps and Detergents. Although soap or soap powder may be used, it reacts in hard water with calcium and/or magnesium compounds to form curds that can redeposit on fabrics. On the other hand, various synthetic detergents are available that do not react with mineral salts in hard water. These are formulated with such ingredients as surfactants that suspend dirt particles with reduced suds, builders that prevent scum formation, antideposition agents that prevent lifted soil particles from resettling on the fabric that might otherwise become gray, fluorescent whiteners, and fabric softeners. The manufacturers' directions for using laundering agents and washing machines should be followed. Studies have shown that the level of detergent use, more than any other single factor, is the most important factor in retention of original whiteness of laundered fabrics. Other factors are insufficient hot water, improper soaking, overloading the washing machine, overlong wash periods, insufficient detergent,

and improper use of the soft-retain system. These fabrics have lost their whiteness due to accumulated redeposition, it is difficult and sometimes impossible to recover it.

Bleaches. Bleaches are oxidizing agents which act as germicides and color removers. They may also adversely affect fabrics if not properly selected and used with care. There are two major types of bleaches: hypochlorite and oxygen.

Hypochlorite Bleaches. Most hypochlorite bleach used is sodium hypochlorite in a 5 to 6 percent solution. Another form of hypochlorite bleaches are the "chlorine" powders which utilize N-chloro compounds which act as an "instant" hypochlorite when dissolved in water.

As discussed in various sections of this text, certain fibers are degraded by hypochlorite bleaches. Certain wrinkle-resistant finishes react with them and yellow the fabric. Some fluorescent whiteners are destroyed by hypochlorite bleach unless the addition of the bleach is delayed in the washing cycle to allow the fluorescent agent in the detergent to become attached to the fabric. Hypochlorite bleach is dangerous if it comes in contact with the skin, eyes, or hair. It is also corrosive. Appropriate use and care should be exercised. However, this type of bleach is an effective germicide.

Oxygen Bleaches. Powder bleaches usually contain sodium perborate or potassium monopersulfate. The latter is slightly more active, but both may safely be used on all fabrics. They do not yellow wrinkle-resistant finishes and they generally do not fade colored items. However, oxygen bleaches are not very effective germicides.

Fabric Softeners. Fabric softeners are based on quaternary ammonium compounds. The cationic in the compound imparts a soft hand, reduces static charge, and makes ironing easier. Some also reduce wrinkling. As already noted, some detergent formulations include them.

Fabric softeners are also available either as an ingredient to be added to rinse water or in a form to be put into the dryer.

It is important to follow instructions for the use of fabric softeners. They should be used in the proper concentration and at the proper time. If too much

is used at one time, a build-up of the cationic chemical can develop and cause the fabric to feel greasy and in some instances cause the fabric surface to be water repellent—which certainly would not be suitable for towels, for example. Some fabric softeners must be added to the final rinse, otherwise a reaction with certain detergent ingredients (such as a water softener) or with a chlorine bleach may nullify its effectiveness. An alternative is the use of a dry fabric softener put into the dryer where it is deposited on the fabrics with the aid of the moisture and heat.

REVIEW QUESTIONS

1. In what way does the label on a garment help in caring for the garment?
2. (a) Why should most clothes be placed on hangers when not in use? (b) Why are knitted garments an exception?
3. (c) How should knitted clothes be kept?
3. Why is a firm brush recommended for brushing clothing?
4. Why should garments not be crowded in clothes closet?
5. Why should white garments be separated from colored ones before laundering?
6. (a) Give illustrations of what is meant by "needed repairs." (b) Give reasons for attending to these without delay.
7. (a) Why should clothes be given a rest? (b) How does this apply to wool clothes?
8. Why should a stain or spot be removed as soon as it is discovered?
9. What are the principle features of the Permanent Care Labeling Rule?

10. When laundering clothes, what considerations should be given to the use of (a) bleaches and (b) fabric softeners?

SUGGESTED ACTIVITIES

1. For your next buying trip to a retail store, prepare a list of questions that you consider important enough to ask the salesperson to make certain that your selection of the clothing item is a prudent one.
2. Cut six advertisements from a newspaper, and circle all the textile terms that have taken on new meaning for you since studying textiles. Explain how familiarity with these textile terms has proved helpful to you recently.

113

though they are now also woven in other parts of the city. Brocades are textiles woven with warp and weft threads of different colours and often of different materials. The Benares brocades are woven in silk, with profuse use of metal threads on the 'pallavs' (endpieces) and the field of the sari. The weavers are Muslim, but, significantly, they are not known by the common word for weaver, 'jullaha', but as 'kangar', which means 'artist'. The brocades are woven in workshops known as 'karkhanahs', which are a series of interconnecting rooms, usually on the first floor. Almost every square inch of ground space in the room is taken up with looms, and above each loom hangs a crowded arrangement of strings leading down to the loom heddles. The weavers work in artificial light (nowadays, by an electric light), in a calm and quiet atmosphere, which is conducive to the concentration needed for the weaving of such complicated designs.

The zari thread, known as 'kalabattun', consists of finely drawn gold, silver or base metal thread, wound round a silk thread. Silk traditionally came from Bengal, Central Asia and Italy, but now comes from either Malda, in Bengal, or from Kashmir or Japan. Varanasi paradoxically lies within a cotton-growing area, and although there is documentary evidence of cotton textiles dating back to the first millennium BC, there is no mention of silk brocades until Tavernier's description of his visit to Varanasi in AD 1665, from which can be surmised that the textiles he saw in the caravanserais and temples were Varanasi zari-work brocades. The East India Company arrived in Varanasi in 1764 and took over the administration soon afterwards. Varanasi then became a haven for many rich merchants and noble families escaping from the troubles of post-Mughal north India. These were the clients who patronized the Benares zari and brocade manufacturers, and demanded textiles of the type

The densely populated north of India has a proud textile tradition, but there is not nearly so strong a local demand from the rural population for hand-produced textiles as there is in west India. Contemporary phulkaris and Chamba rumals are very rare indeed. Rural life has changed irrevocably and no longer is there time or need for the working of these beautiful textiles. The commercial chikan-work embroidery long ago lost the rich patrons who would commission the

of fineness which gave the Benares brocades their name. According to local legend, Varanasi was one of the centres to which brocade weaving was brought after a great fire in Gujarat in 1300.

The most famous brocaded textile of Varanasi is called 'kinkhab' (a Persian term), woven with a coarse but durable silk known as 'mukta' which is heavy enough to take brocading with gold or silver thread. Kinkhab was also woven at other centres, notably Ahmedabad and Surat in Gujarat and at Patthan, Aurangabad and Hyderabad in the Deccan. Kinkhab was a heavy fabric, often used for furnishing but rarely for clothing, and was not only a popular trading article on the local market, but was also exported to Europe. A silk and zari-work brocade of lighter material and less heavy ornamentation is known as 'pot-dhan' or 'bafta'. The name for brocades without any metal thread work is 'amaru'.

Benares brocades are woven on pitlooms. Traditionally, the design of the brocade was first worked out on paper and then an expert, known as a 'naksha-bandha', rendered the design into cotton threads on a 'naksha' (the indigenous thread device that performs the same function as the Jacquard). The naksha bandhas of Varanasi were so skilled that they tied the designs for the weavers of other brocading centres, such as Surat in Gujarat and Chanderi in Madhya Pradesh. Today in Varanasi, the Jacquard device has overwhelmingly replaced the use of the naksha.

The delicate designs of the past were replaced at the end of the nineteenth century by patterns taken from Victorian sample books of English wallpaper. These very heavy designs have now been largely superseded by patterns inspired by the folk art of Assam, Bengal and Gujarat, and adaptations of Mughal, Rajasthani and Pahari paintings. Varanasi sari brocades, deep-coloured and laden with gold thread, are the popular wedding attire for wealthy Indian brides.

work, leaving it an industry dedicated to the decoration of cheap garments for the foreign and domestic markets.

The remaining strengths of the northern textile tradition are the commercial embroidery and weaving of Kashmir and the commercial brocade weaving of Varanasi. Both have strong mass markets, which provide a base within which textiles, of technical excellence and beautiful design, rival the products of the past.

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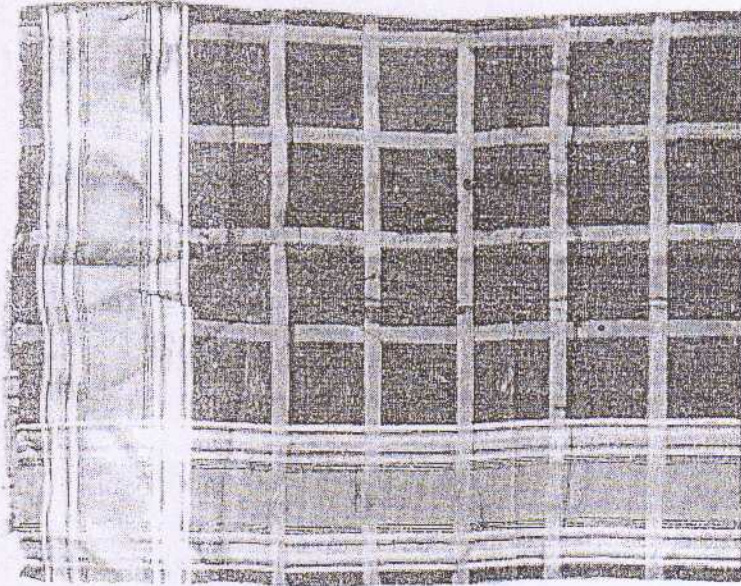
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Bandhani is a type of tie-dye textile decorated primarily by plucking the cloth with the fingernails into many tiny bindings that form a figurative design. The term bandhani is derived from the Sanskrit word banda ("to tie").

Ikat-Bandha of Orissa



Ikat or Bandha of Orissa has gloriously woven, blurred, and gem-coloured motifs in silk and cotton. The dominant motifs in this craft include animals and birds, with the traditional designs being fish and conch shell as well as bolmala, chandankora, and sachipar. As the design-type is single ikat, the designs on the material are blurred," however, this trace-design has a beauty all its own.

The intricate process involves tie and dye --- knotting sections of the yarn before dipping them in colours one at a time, and finally weaving them to produce motifs in multi-hued tones. While Sambalpur is famous for its double-ikat textiles, Sonepur is known for its gold embroidered ones.

Q 72

a lovely blend of colours. Here the jacquard loom is in use.

The *baluchar* style woven in silk is only confined to sarees. It hails originally from a place of the same name in Murshidabad district, West Bengal, and had its heyday under the patronage of the royalty and nobility, later flourished in Vishnupur but is now successfully produced in Varanasi. Very colourful, a real traditional *baluchar* is said to have 17 colours in it, with *butis* sprinkled all over. It is a plain woven fabric brocaded with untwisted silk thread but with unique designs. The very early design seems closer to the *kantha* work. The big *pallu* which is the main piece is a large panel with mangoes in the centre, bordered by diverse designs, depicting a royal court, domestic or travel scenes with horse riders and palanquins, the lotus, the bee, and rosette, the stylised peacock, the bridal *alpana* (floor design) of Bengal, the Taj, etc. The 19th century weaves strangely enough have even European faces mingling with Indian. The sarees are always in dark rich shades, particularly red, purple, and chocolate. The simpler *baluchar* has small dots or flowers all over with a flowery border and mangoes in the *pallu*.

Tanchoi is an example of weaving that resembles our fine miniatures. Its origin is traced to three Indian Parsi brothers by the name of Choi who learnt this craft in China and were practising it in Surat, Gujarat. The fabric came to be called after the three Chois, Tan (corruption of *tran*, three in Gujarati) Choi. Here satin is the base and consists in the merging of the extra weft floats in the fabric.

In *tanchoi* sarees the designs are always floral with interspersing of birds. The usual ground is bright blue, purple, green or red with areas patterned in tabby weave. Figures of flying birds, paired cocks amidst floral sprays are worked in. In some the *pallu* is more solidly done with peacocks, baskets or bunches of flowers. The unusual ones have whole hunting scenes spread all over.

Patola is a most colourful and ostentatious

weave with its figured body, and the subtle merging of one shade into another. This technique is practised in a few parts of India with some variations, mostly producing sarees, a few shawls, lungis, kerchiefs, etc. The most renowned among *patolas* is the one made in Pattan, Gujarat. The yarn used is always silk. The warp colours are dyed in the lightest colour to be used in the pattern, then the portions which are to be the next darker in shade are traced on a bundle of the threads either by charcoal or pencil. The threads within the pattern are then tightly tied with a cotton thread where the marks are made and the formula continued with the threads that are to bear the next shades of the pattern until the darkest shades are reached. The weft is treated in the same way so that while weaving it crosses the warp, each of its colours synchronise with the same warp. In the weaving proper the weft is woven into the warp with extreme dexterity and precision. Thus the desired figures are obtained by juxtaposition of similarly dyed shades on equal lengths of warp and weft, and interlacing them. The pattern is laid facing the saree side, the border strip being carried within the field to portray the design. Therefore, where animals and birds are depicted, strangely enough, only their feet are seen pointing inwards. Some of the important designs are: *rattan chowk*, in which diamonds cross with diamonds as they are interspersed around; walnut; *narikunja*; dancing girl; parrot and elephant; *chhabri* is a basket made up by four elephants; *waghkunjar*; tiger-elephant. Then there is a variety of leaf and flower and geometrical patterns. The colours are vivid and pleasantly harmonised.

This technique is named by ethnologists as *ikat*. This word is supposed to be of Malayan origin but actually the name was given to the technique by the Indonesians. *Ikat* is the equivalent of the Indian *bandhana*. When only one side of the warp or the weft is tied, it is a single *ikat*. But as described above when both are tied it is double *ikat*. This is now done on a very small scale in Pattan which is said to be its home, in Mehsana

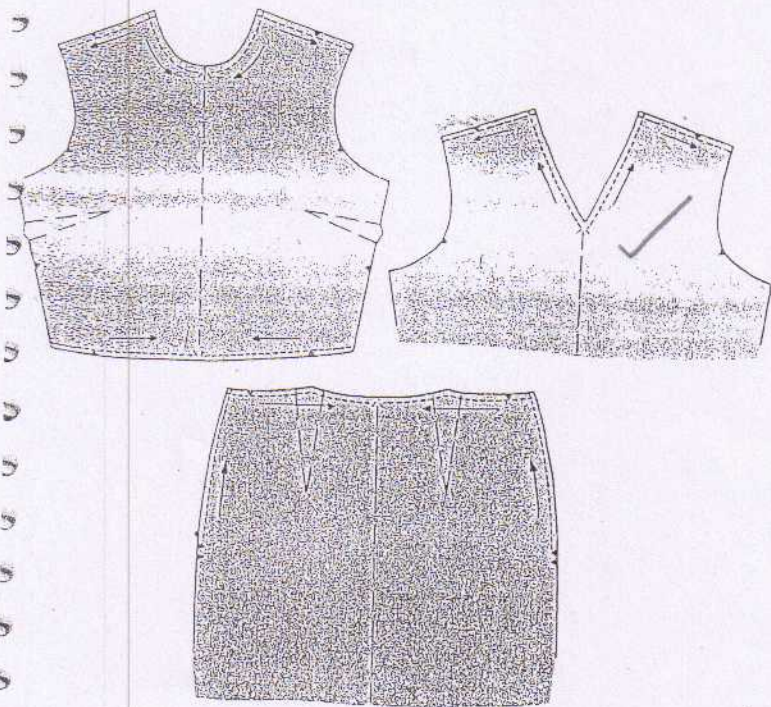
Assembling Your Work

With the fabric cut out, pins ready, and with a threaded needle and a threaded machine waiting to be used, the moment has come to put your creation together. Your next steps will be:

1. Stay stitching.
2. Tacking.

Stay Stitching

Stay stitching is a line of machine stitching, placed through a single thickness of the seam allowance, 1.2 cm ($\frac{1}{2}$ inch) from the seam edge. It is used to hold the original shape of necklines, shoulder lines, waistline and hip-lines, and to prevent them from stretching when fitting and handling the garment. Stay stitching is not always a necessary step in dress construction. Some dress-makers like to stay-stitch fabrics which stretch easily or are to be pinned together.



60

For your stitching, use matching thread and the correct stitch length for stitching seams in your fabric. Chain stitching can also be used to stay-stitch seams. See page 63.

Direction of Stay Stitching

- NECKLINE - from shoulder to centre
- SHOULDER LINE - from neckline to armhole
- WAISTLINE (skirt and blouse) - from side seams to centre
- HIPLINE and bias skirt seams - from lower edge to waistline
- 'V' NECKLINE - from point of 'v' to shoulder line

Tacking

Tacking is a temporary stitch made to hold two or more pieces of fabric together before final stitching. It makes it easier to fit and stitch so that a good finish is achieved. Tacking may be done by hand, or by machine. A very simple garment may be pinned together. It is removed after each seam is stitched.

Hand Tacking

Use a long, slender needle and a single strand of thread not more than 75 cm (30 inches) in length and in a contrasting colour so that it can easily be seen in the fabric. You may use 'tacking' thread, which is soft and lightly twisted, or mercerised thread. Use silk thread for fine fabrics when tacking on the right side to hold two or more layers in position during final pressing - for example, along the finished edge of a facing, the fold for a hem and similar details. In these cases silk is better because it does not leave a mark after pressing and will not mark fine fabrics at the needle puncture.

When tacking sections of a garment, work on a flat surface such as a table or lap board. Place the seam edges together; pin at each end, at notches and at the centre. Then space the pins at equal intervals, working outwards. Place the pins at right angles to the seamline, with heads to seam edge. Do not ease or stretch seam.

FOUR SKIRT FOUNDATIONS

Each of the four skirt foundations has a specific name that identifies its silhouette. It is the amount of deviation from the basic skirt that determines the new silhouette.

✓ Straight, or Rectangular, Shape (Basic Skirt)

The skirt hangs straight from hipline to hemline.

✓ A-Shape, or Triangular

The skirt falls away from the hip, flaring out at the hemline, increasing the hemline sweep. (Circular and flared shapes are included in this category.)

Pegged, or Inverted Triangle

The skirt tapers inward from hip level to hemline. The pegged silhouette may be achieved by increasing waist and hip fullness or by tapering from hip to the hem.

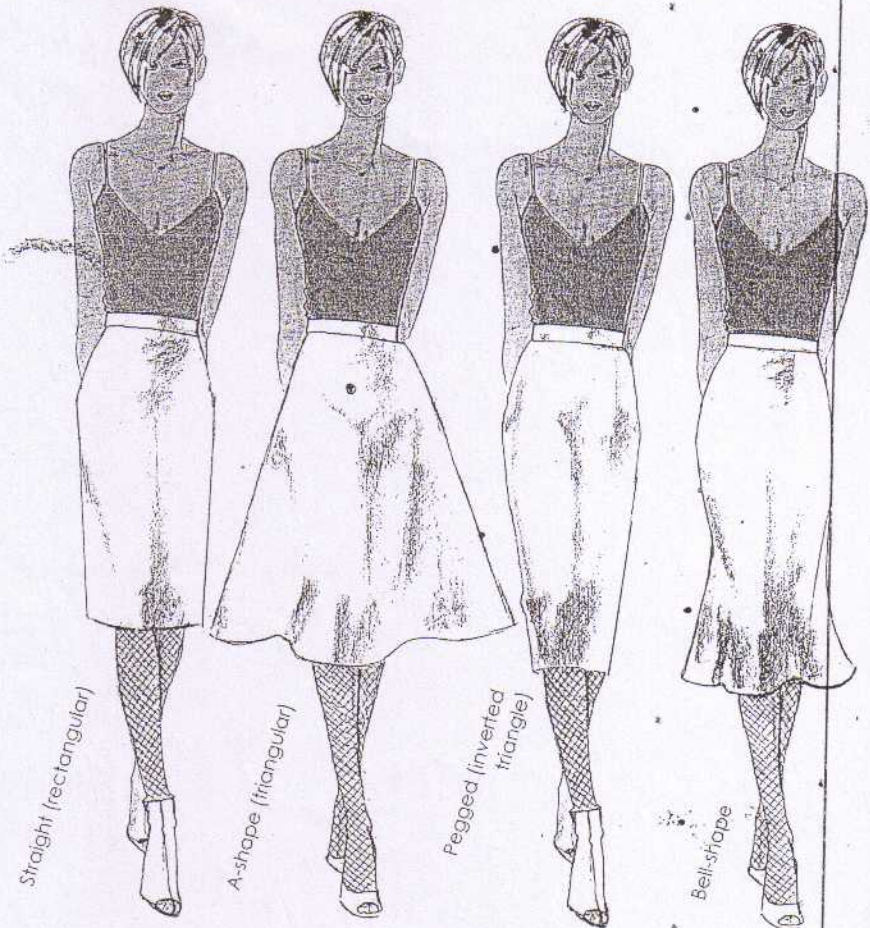
Bell-Shape

The skirt clings to the figure's curves at, above, and below the hip and breaks into fluid movement at the hemline.

SKIRT CHARACTERISTICS

Skirts are described in terms of the following areas:

- *The sweep:* the width of the skirt at hemline
- *Movement:* the way a skirt's fullness reacts to movement of the body.
- *The break point:* the point at which the skirt breaks away from the body into fluid movement.



The Pattern Piece

Each pattern piece contains written directions and symbols such as dots and arrows—a kind of shorthand that's easy to learn and speeds up sewing because it shows you which edges to match and where to position details.

Notches are triangular symbols extending from the cutting line *into* the seam allowance. To mark notches, cut triangles or snip into the seam allowances along notch lines. If you think you may have to let out a seam after stitching, mark notches by cutting triangular shapes that extend *out* from the cutting lines.

Letters are printed on each pattern piece so you can tell one from the other. The top of the letter always points to the top of the pattern piece.

Solid lines* show where to position pockets, buttonholes, the waistline, or where to fold the fabric.

Center line* is a broken line that appears on some pattern pieces.

Grainline arrow is used for positioning pattern piece on the correct fabric grain (see above, right).

Lengthen or shorten here lines are two parallel lines which indicate where to make the pattern piece longer or shorter so the finished length will be right without distorting the garment shape.

Cutting lines are solid lines along the outer edge. Follow these lines when you cut your fabric.

Seamlines are broken lines, usually $\frac{3}{8}$ " (1.5 cm) from the cutting line. When you sew a seam, you are actually stitching two layers of fabric together on the seamline. Multiple-size patterns do not have marked seamlines.

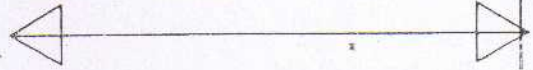
Dots* are circles which mark points to be matched before stitching and the placement of details, such as darts, tabs and belt loops.

Seam allowance is the area between the seamline and cutting line.

Darts* are shown as V-shaped broken lines with dots. To sew, match the dots, folding fabric with right sides together, and stitch along the broken line. Darts shape fabric to fit over your body curves—bust, hips, shoulders.

Hem tells you how much fabric to turn up for the hem.

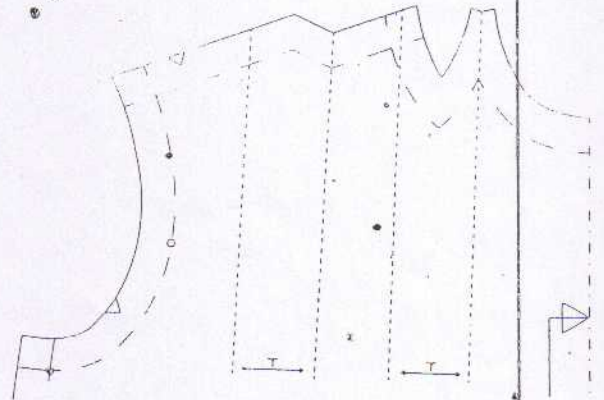
Straight grainline arrows indicate pieces that must be placed parallel to the edge of your fabric.



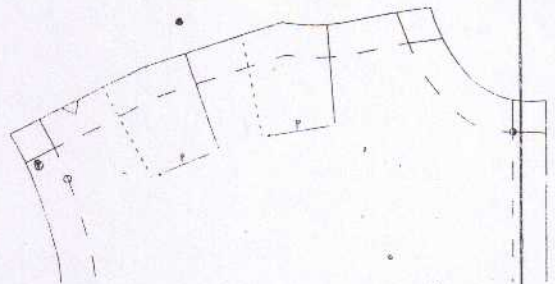
Squared-off grainline arrows indicate pieces that are placed along folded fabric edges.



Tucks* are shown as broken lines with double-headed arrows in between, near the end of each tuck. To sew, match the broken lines, folding the fabric with right sides together, and stitch along lines.



Pleats* are shown as broken and solid lines with directional arrows in between, at the end of each pleat. To make a pleat, fold your fabric on the solid line and bring the fold to the broken line. Press. Baste across top of pleat.



The symbols with an asterisk () eventually get transferred onto your fabric; you'll learn more about this on pages 86-88.

drop shoulder - Shoulder line located below the normal line.

ease - The even distribution of fullness when one section of a seam is joined to a slightly shorter section without forming gathers or tucks. Used to shape set-in sleeves, the shoulder line and other areas.

ease allowance - The amount added to body measurements to make garments comfortable and allow for movement.

edge-stitch - 1. To stitch close to a finished edge or seam from the right side of the fabric. 2. To stitch close to the edge of a fold after the fabric edge is turned to the underside. Used to finish hems and facings.

embroidery hoop - Two narrow circles of wood, the smaller of which is placed under the fabric and the larger over it on the top side - used to hold fabric taut.

facing - The second layer of fabric used to finish necklines, front and back openings and sleeves.

featherbone - A narrow strip of boning used to stiffen the seams and edges of closely fitted garment sections to prevent them from slipping or rolling; for example, the bodice of strapless dresses, and cummerbunds.

fibres - Natural or man-made filaments from which yarns are spun.

finger-press - To press flat (as a turning or seam) using fingers and thumbnail.

finishing - The sewing techniques used in garment construction to finish seams, facings, hems, necklines and other sections.

fly - A neatened opening that conceals the zip or buttons. Generally used in shorts, men's pants and topcoats.

footboard - The upright board at the foot of a bed.

gather - To control fullness by a running stitch through the fabric; the thread is fastened at one end and then pulled up from the other end.

grain - In woven fabrics, the lengthwise and crosswise direction of the yarn. The lengthwise yarn forms the lengthwise grain; the crosswise yarn, the crosswise grain. When these two threads or grains are at right angles, the fabric is 'on the true grain'.

guidelines - Tacked stitches to be followed for the final stitching (for buttonholes, pockets, etc.).

gusset - A small shaped piece of matching fabric set into a slash or seam for added width and ease. Found at the underarm when sleeve and bodice are cut in one, and in briefs and knickers.

haberdashery - Small sewing needs, such as thread, needles, pins, zips, press fasteners, hooks and eyes, bias binding, etc., available at haberdashery and notion counters in department stores.

headboard - The upright board at the head of a bed.

heading - 1. A fabric tuck above the casing or at the top edge of curtains. 2. A narrow edge above a line of gathers that form a frill.

hemline - The line on which the hem is marked and turned to the underside. This line is an even distance from the floor.

hem-marker - See skirt marker.

interfacing - A third thickness of carefully selected fabric which is placed between the garment and facing fabrics for added body, shaping and support.

interlining - A fabric placed between the lining and outer fabric. Used in coats, jackets and the like to add warmth or bulk; in bedspreads to give body; in curtains to add body and to prevent light from showing through and fading the fabric.

intersecting seams - Seams that cross one another where garment sections are joined together at the waistline, shoulder line, set-in sleeve and similar points.

'iron-on' - A term used to describe chemically treated fabric which is joined or applied to another fabric by using a warm iron (for hem facings); also an embroidery transfer design (on tissue paper) which is placed face down on the fabric - the heat of a warm iron then transfers the design to the fabric.

joinings - The points at which one garment section is joined to another, such as skirt and bodice.

lap - To extend or fold one piece of fabric or garment section over another.

lapel - The section of a garment which is turned back between the top button and collar.

layout - The position in which pattern pieces are laid on the fabric for cutting.

layering - Trimming all seam allowances within a seam to different widths. Layering removes bulk so that the seam will lie flat.

link buttons - Two flat buttons held together by several threads covered with blanket stitch (as a French top or button shank) forming a cuff link.

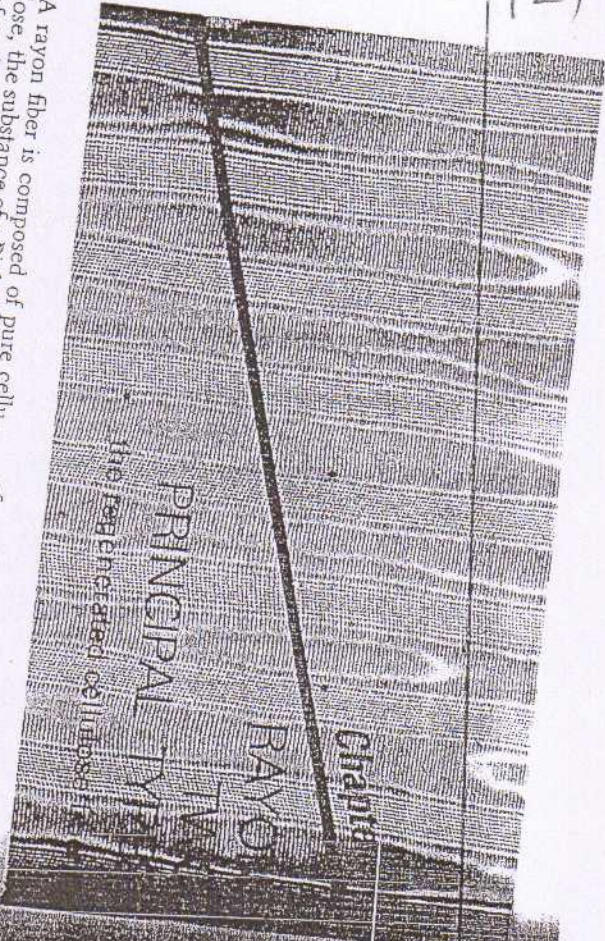
lining - A carefully selected fabric that covers the underside of another fabric, adding body to the article. 1. In dress construction, the lining is cut the same as the dress fabric and constructed separately. It adds a finished look to the inside. 2. In tailoring, the lining is constructed to fit into the jacket or coat and prevent the unfinished seam allowance from showing. 3. In home decorating, the lining is used to finish curtains and protect the top fabric. It is also used in bedspreads.

made-to-measure - Professionally made and fitted garments, loose covers, bedspreads and curtains.

markings - The symbols shown on the pattern for details such as buttonholes, tucks and other construction details. They are transferred from the pattern to the fabric by means of tailor's tacks, chalk, tackings or tracing wheel.

mercerised - A finish for cotton that adds strength and lustre and makes the fabric more receptive to dyes.

mitre - 1. The diagonal line formed when fabric is joined.



Q87.

Mannmade fiber

Manmade rayon was produced in the United States but manufacture was discontinued in 1976. A relatively small amount of cuprammonium rayon is still produced in Germany and Japan.

Manmade textile filaments were officially recognized in 1925, when the Federal Trade Commission (FTC) permitted the use of the name "rayon" for yarns obtained from cellulose or its derivatives. After production and types of manmade fibers had increased and been given various trademarks, the FTC ruled again in 1937 that any fiber or yarn produced chemically from cellulose must be designated "rayon."

Over the period of the next fifteen years, however, confusion developed among garment manufacturers, and particularly among consumers, because there were as many as four different types of rayon with some similar and some different properties. Some rayons would fade faster than others; some would dry more quickly than others; some would stick to the iron and melt, others would iron nicely. The cause of this lay in the fact that there were basically two groups of rayons: one consisting of regenerated pure cellulose, the other of a cellulose compound. These different compositions gave different properties. The FTC therefore ruled that as of February 9, 1952, there would be two categories of cellulose fibers: rayon and acetate. All fabrics and garments containing rayon and/or acetate must now be labeled as such and the percent of content of each fiber indicated. The rules also incorporated the first official designation of rayon and acetate products as manmade rather than synthetic. In the chemist's terminology, rayon and acetate are not synthetic because natural materials—cotton linters and wood pulp—are used in their manufacture, rather than chemical elements.

BASIC METHOD OF PRODUCING RAYON FILAMENT

The natural process by which the silkworm transforms the cellulose of mulberry trees into two fine filaments is simulated in the process of making rayon.

A liquid substance of cellulose is forced through a metal cap or nozzle about the size of a thimble. This nozzle is called a *spinneret* because it performs the same function as the silkworm's spinneret (see Figure 18-1). The cap is usually made of a platinum-rhodium alloy because that metal is not affected by acids or alkalis; it is perforated with small holes that are almost invisible to the naked eye. Through each of the tiny holes, a filament is extruded, which is solidified by a liquid bath as it comes from the spinneret. This is similar to the hardening by air of the raw-silk substance spun by the silkworm. The number of holes in the spinneret ranges from 1 to 20,000, and filaments of equal size are simultaneously produced. In a subsequent operation, these filaments are combined by twisting to make any required diameter of rayon yarn.

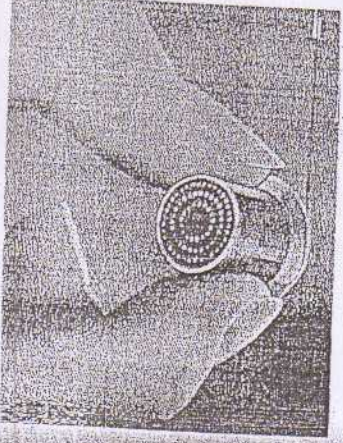


Figure 18-1 The spinneret that forms the spinning solution into filaments. (Courtesy Avoca Fibers, Inc.)

A rayon fiber is composed of pure cellulose, the substance of which the cell walls of such woody plants as trees and cotton are largely comprised. We are already familiar with cellulose in the form of such products as paper.

Rayon fibers are made from cellulose that has been re-formed, or regenerated; consequently, these fibers are identified as *regenerated cellulose fibers*.

HISTORY OF RAYONS

The production of a fiber such as rayon, the first of the manmade fibers, had been prophesied as long ago as 1664 by Robert Hooke, the English naturalist. He believed that it was possible to make an "artificial glutinous composition, much resembling, if not full as good, nay, better, than that excrement, or whatever other substance it be out of which the silkworm wire-draws his crew." In 1710, René A. de Réaumur, the French scientist, suggested the possibility of making silk filaments out of gums and resins; for example, threads

of varnish. One hundred and thirty years later, in 1840, an apparatus was invented that drew synthetic filaments through small holes. In 1855, Georges Audemert, a Swiss chemist, discovered how to make cellulose nitrate. This was the first step toward the nitrocellulose process of making rayon. Almost thirty years later, in 1884, Count Hilaire de Chardonnet produced the first manmade textile fiber from nitrocellulose. He became known as the "father of rayon." Chardonnet obtained the original French patent and won the financial support that built the world's first rayon factory. Yet, it ultimately was superseded by other types.

In 1890, L. H. Despaisses of France developed the cuprammonium process for making rayon, which had some properties that were superior to those of nitrocellulose rayon. Although it was initially not economically competitive to manufacture, improvements in the manufacturing technique developed in Germany resulted in successful commercial production there in 1919. Subsequently, cupram-

Q 87

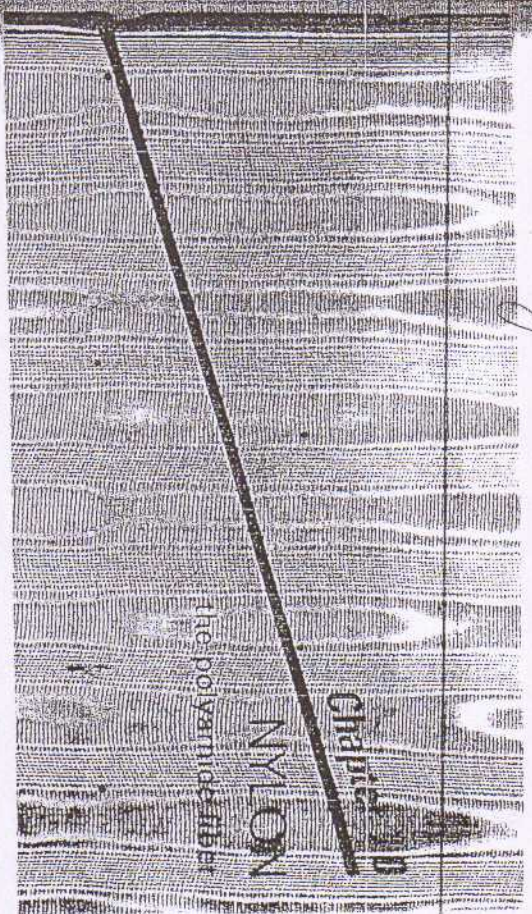
4. (a) What variations are made in processing synthetic fibers? (b) What characteristics do they give to the yarn?
5. Distinguish between triacetate and Arnel.
6. (a) What major finishes are applied to acetate fabrics? (b) How effective and durable are they?
7. (a) What major finishes are applied to triacetate fabrics? (b) How effective and durable are they?
8. Fabrics of Arnel triacetate are considered to be easy-care material. Why?
9. Name some fabrics (a) that could be made of acetate and (b) that could be made of triacetate. Name uses of each.
10. What would be the characteristics of

fabrics that were made of the following: (a) acetate and wool, (b) acetate and rayon, (c) triacetate and cotton, (d) triacetate and wool, (e) triacetate and rayon?

SUGGESTED ACTIVITY

Obtain one advertisement or label identifying an acetate fabric, an Arnel triacetate fabric, a blend of acetate and another fiber, and a blend of Arnel triacetate and another fiber. Make a chart comparing the properties described on the label. Evaluate this information.

Q81
Synthetic fibers.



The word "nylon" is a generic term that designates a group of related chemical compounds classified as polyamides. Nylon is not a trademark—it is a textile, just as cotton, linen, wool, silk, rayon, and acetate are textiles. As defined by the Federal Trade Commission (FTC), nylon is a long-chain synthetic polyamide in which less than 85 percent of the amide linkages are attached to two aromatic rings. While this chemical definition may not be easily recognized by laypersons, it is evident that variations are possible and that there could be and are many varieties of nylon with certain differing properties.

HISTORY OF NYLON

Responsibility for the discovery or invention of nylon belongs to E. I. du Pont de Nemours & Co. More specifically, the credit belongs to Dr. Wallace H. Carothers and his staff of organic chem-

ists of that company's chemical department. Realizing that there was a need for a more active program of research to provide new developments that would insure the future growth of the company, Du Pont began a long-range program of chemical exploration in 1928. Deviating from the applied research previously conducted, this fundamental research aimed primarily to develop basic knowledge of chemical materials and processes. Dr. Carothers was interested in obtaining a better understanding of polymerization. He wanted to know how and why certain molecules join to form "giant" molecules, such as those that occur in cotton, silk, and rubber. After many months of research, one of Dr. Carothers's assistants discovered that one polymer, which looked like clear, heavy molasses when molten, could be drawn out into a long fiber. When it cooled, the fiber could be drawn out farther to several times its original length. This strand was strong, lus-

Q87

123

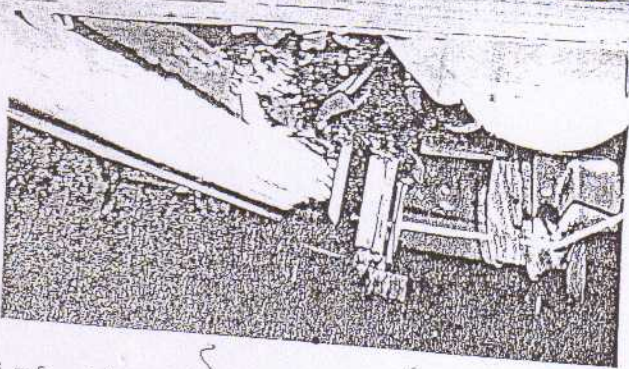


Figure 16.9 Slivers from the combs are combined and fed into a drawing unit, where the slivers are pulled and drawn to form a single roving (see Mills)

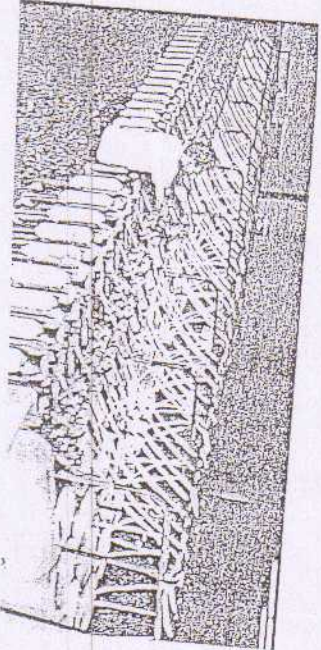
together and drawn out into a new sliver no larger than one of the original single slivers.

If the yarn is to be an intimate blend of two or more fibers, the slivers will be different fibers. For example, one sliver of cotton fibers for each sliver of polyester fibers will produce a blend of approximately 50 percent polyester and 50 percent cotton. As yet, no twist will have been introduced into the yarn. (Fig. 16.9).

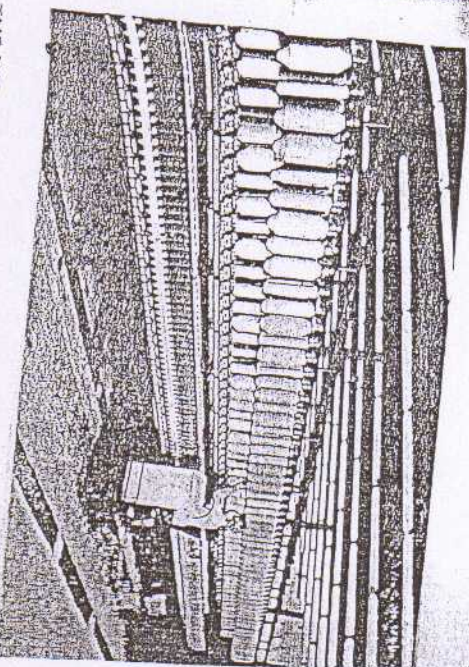
Roving (The sliver from the drawing machine is taken to the roving machine, where it is attenuated until it measures from $\frac{1}{4}$ to $\frac{1}{8}$ of its original diameter. As the roving strand is ready to leave the roving frame, a slight twist is imparted to the strand, and it is then ready for the spinning frame.) The fineness and intimacy of blending of the yarn depend to some degree on the number of times the slivers are doubled and redrawn during the roving operation (Fig. 16.10).

Spinning The final process in the manufacture of yarn is the spinning operation. In the spinning frame the yarn is stretched to its ultimate diameter, and the desired amount of twist is inserted. Several methods are used for imparting twist during the spinning operation. For cotton yarns as well as for other fibers processed in the cotton system the most common technique is *ring spinning*. In ring spinning, the drawn-out roving is guided in a downward direction through the *drawn-out roving* is guided in a downward direction through the *traveler*, a small inverted U-shaped device. The traveler moves around the ring at the rate of 4,000 to 12,000 revolutions per minute. As the spindle revolves to wind the yarn, the latter has to pass through the traveler, which carries it around the ring. This process imparts the desired twist. The yarn as it comes from the spinning machine is a single yarn.

Other methods of spinning include the *flyer* and *cap* systems. The flyer process was the original method of continuous spinning, but it is seldom used today because it is slow and production is low. However, yarns made by the flyer process are smooth and have a high luster (Figs. 16.11, 16.12).



89



THE WOOL SYSTEM

Wool and man-made fibers can be spun into yarns by woolen or the worsted systems. The woolen system is comparable to that used in spinning carded cotton, where the yarns are combed drawn, and spun. Yarns made by the worsted system are similar to produce smoother and finer-quality yarns. Another difference between woolen and worsted yarn is the fiber length involved. Woolen yarns use the shorter length of wool fibers, whereas worsted yarns use the longer length of wool fibers.

Sorting Each fleece is carefully opened, and an expert grades or sorts the fibers apart and sorts the fibers according to their width and length of fiber and sometimes according to fineness. The grade of fiber determines the type of product for which it will be used. Fine fibers that are relatively long are reserved for the finest wool fabrics and for worsteds; medium fibers are reserved for shirting fabrics and for worsteds; coarse fibers, both long and short, are reserved for rough fabrics and carpets. The best-quality fibers come from the necks and shoulders of the sheep. Lambs' wool, sheared from the soft-textured sweaters or similar products.

Scouring After sorting, the wool is scoured. This involves washing in warm soapy water several times, followed by thorough rinsing and drying. Scouring is essential for it removes the natural grease in the fiber, the silt or body excretions, dirt, and dirt used in the process.

publicity Nonpaid messages about a company and its policies, personnel, activities, or services.

Quick Response (QR) An attempt to speed ordering and distribution between all levels of the industry via electronic data interchange.

quotas A means of regulating exports and imports.

ramie A natural vegetable fiber from the stem of a nettlelike shrub.

rayon A man-made fiber made from rejuvenated cellulose.

ready-to-wear Apparel that is mass produced (opposite of custom made).

receiving The area of the store where packages are opened, checked, and marked.

repeat The repetition of a print in fabric design.

resource Term used by retailers for a manufacturer, wholesaler, vendor, or distributor. A company that sells goods in the market of finished apparel.

retailing The business of buying goods at wholesale markets and selling them at retail to the ultimate consumer.

retail price The wholesale price plus a markup covering the retailer's operating costs and a profit.

sales per square foot Amount sold per square foot of store floor space; measure of productivity.

sample The trial garment or prototype.

sample cut A 3- to 10-yard length of fabric used by the design department to make up a trial sample garment.

Savile Row Street in London famous for its men's tailors.

seamless distribution Using electronic data interchange to create a smooth distribution system that saves money and time.

selected distribution Limiting the number of stores that may buy merchandise to maintain exclusivity.

sell through The ability of a line to sell regularly and steadily at full price.

Seventh Avenue The main street of New York City's garment district; the term is used to represent the whole district.

showroom A place where sales representatives or management show a line of merchandise to potential buyers; called *salon de presentations* in France.

signature collection A collection using the designer's name as the label.

silhouette Outline of a garment.

silk The only natural fiber in filament form; obtained from the cocoons spun by silkworms.

soft goods Fashion and textile merchandise.

sourcing Worldwide search for the best available fabrics or garment production at the best price.

spandex A man-made fiber of long-chain synthetic polymer comprised of stretchable segmented

polyurethane; known best by the DuPont brand name of Lycra.

special events Activities set up to attract customers to a selling place.

specialty store A retail establishment that handles narrow categories of goods, such as men's apparel, women's apparel, or shoes.

spinning The process of extruding and hardening man-made fibers, the process of drawing and twisting staple fibers together into yarn or thread.

staple goods Goods for which there is a demand that continues over many seasons.

stock turnover The number of times a store's merchandise stock is sold and replaced in a given period.

store image The character or personality that a store presents to the public.

style Certain characteristics that distinguish a garment from other garments; a particular look in fashion.

style ranges Categories of styles that appeal to different consumers.

stylist A fashion expert; generally selects colors, prints, or styles for presentation or prepares fashion merchandise for photographic presentation in an advertisement or catalog.

tanning The process of transforming animal skins into leather.

target market The group of consumers to whom a producer, manufacturer, or retailer aims products, services, and advertising.

textile fabrics Cloth made from textile fibers by weaving, knitting, felting, crocheting, laminating, or bonding.

texture The surface interest in a fabric.

texturing The process of crimping or otherwise modifying continuous filament yarn to increase cover, abrasion resistance, warmth, resiliency and moisture absorption or to provide a different surface texture.

toile (twahl) French word for a muslin sample garment.

trademark Company's individual registered mark and name for a product.

trend buying Buying from new resources to obtain fashion newness.

trendsetter A designer or fashion leader who sets a fashion direction that others follow.

trunk show Show of designer clothes that moves from store to store, often accompanied by a personal appearance by the designer.

unit control Systems for recording the number of units of merchandise bought, sold, in stock, or on order.

unit production systems (UPS) Computer-guided conveyors that move garments automatically from