6

Structures and formation of fancy yarns

As we have suggested, fancy yarns fall into categories, depending upon the basic morphology of the yarns. Marls, spirals and gimps may be produced on ordinary doubling frames or by the ring spinning system. Gimp yarns require a binder and are therefore produced in two stages on the ring spinning system. In most cases, these yarns are used to create subtle textural or colour effects – in particular, spirals and gimps offer the opportunity to create the finer textural yarns, which can be of particular use in woven fabrics or fine summer knitwear.

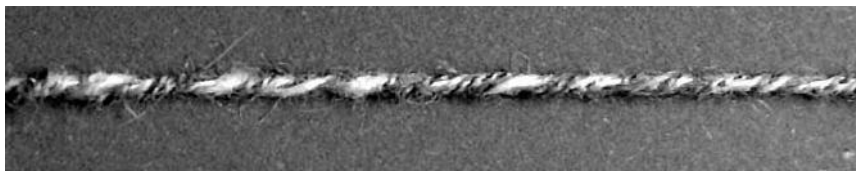
Snarl, loop and bouclé yarns are all used both in woven and knitted fabrics. In the coarser counts, they can be used to produce strongly textured knitwear using simple constructions, while in the finer counts, they may produce elusive colour and texture effects in woven or knitted fabrics. They may be produced using modified ring spindle systems, hollow spindle systems, or the combined system machines – in one step only where the wrap spinning system is used, or in two stages on the modified ring spindles.

Chenille, cover, and laminated yarns most frequently appear to be of even diameter, the effect being achieved by the surface of the yarn. This surface may offer the 'velvety' look of the chenille, or the sparkle of the metallic yarns that are most often made using the 'cover' or 'laminated' structures.

6.1 Marl yarn

The simplest of the fancy effects, a marl yarn is one in which two yarns of the same count and twist, but of different colours, are folded together to form a balanced yarn (see Fig. 6.1). They are, therefore, essentially plain folded yarns with the additional characteristic that the yarns folded together are of a different colour or texture. As such, they barely count as 'fancy yarns' at all, except in that they result in a subtle, but noticeable, modification to the appearance of the finished fabric. These yarns are used to good effect in discreet pinstripes for men's suitings or to produce a subtly

6.1 Marl yarn structure.



6.2 Marl yarn.

and irregularly patterned knitted fabric using a relatively simple fabric construction. They may be used also to provide a Lurex® or other metallic yarn with strong support, while at the same time creating a more subtle effect. The yarn picture in Fig. 6.2 shows clearly the alternation of the colours that is the primary effect of a marl yarn, as well as demonstrating the plain structure, which is that of an ordinary folded yarn.

In some cases, a similar but less even effect can be gained in a knitted fabric by feeding two yarns at the same time. This eliminates the doubling process, thus reducing production costs. The effect produced is not as stable as that of the marl yarn, but 'multi-ending', as it is known, can also be useful to knitters when fancy effects are not sought. It can assist in reducing the technical problems related to uneven stretch and recovery properties that may exist after package dyeing any yarn.

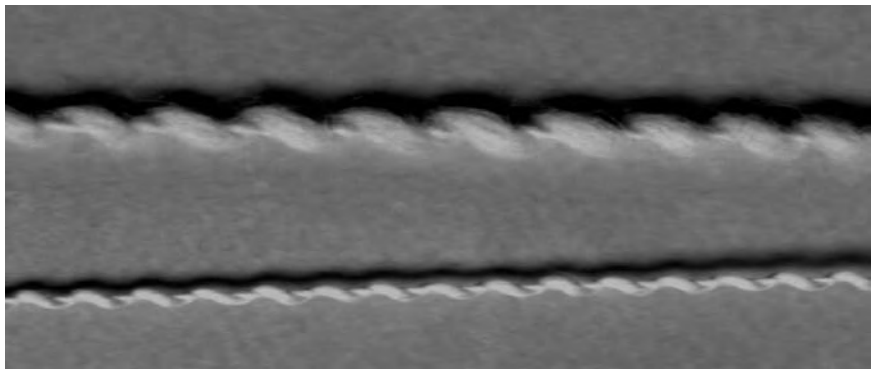
6.2 Spiral or corkscrew yarn

A spiral or corkscrew yarn is a plied yarn that displays a characteristic smooth spiralling of one component around the other. Figure 6.3 shows the basic structure, which is straightforward, and except in the differing lengths of the two yarns involved, very similar to the structure of a marl yarn. Indeed, just like the marl yarn shown in Fig. 6.1, it can be produced relatively simply on a doubling frame or under the ring spinning system. It is more textural in appearance than a marl, and the finer counts may also appear in some of the laces used in lingerie.

It may be formed by one of several methods:

1 If equal lengths of S and Z twist yarns are combined with twist (either S or Z), the component to which twist is added will contract in length while the other will extend and spiral around the outside of the yarn thus formed. This produces an unbalanced-twist spiral yarn.

6.3 Spiral yarn structure.



6.4 Spiral yarns.

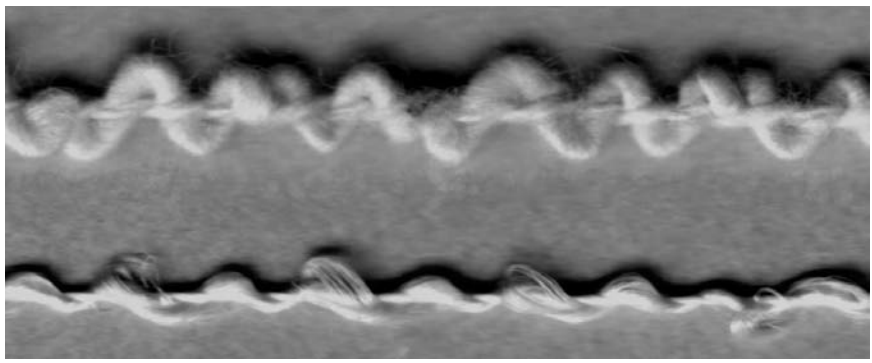
2 One or other of the two yarn components may be delivered at a greater rate. The shorter length forms the base, while the greater length of its companion (or in the case of more complex yarns, companions) follows a spiral around it.
3 If equal lengths of two yarns, one coarser than the other, are folded together with a twist that opposes the thick yarn twist, the thicker yarn will appear to spiral around the thinner yarn.

Figure 6.4 offers examples of two very different spiral yarns. The top yarn seems to be relatively heavy and shows that two different types of thread were used to make it – the first is tightly twisted, fine and lustrous while the second is less compact, and by contrast appears almost fluffy. The other, a fine viscose spiral yarn, is one in which the two component yarns are of much more similar count and structure. These yarns would be used to give very different effects in a fabric. In particular, the heavier yarn would offer the opportunity to impart very subtle flecks of shine to a dull surface. The finer yarn, on the other hand, would allow the designer to take advantage of the uneven reflectance to reduce the 'flat' effect of a very shiny fabric, imparting visual and tactile textures at the same time.

6.3 Gimp yarn

A gimp is a compound yarn consisting of a twisted core with an effect yarn wrapped around it so as to produce wavy projections on its surface. This

6.5 Gimp yarn structure.



6.6 Gimp yarns.

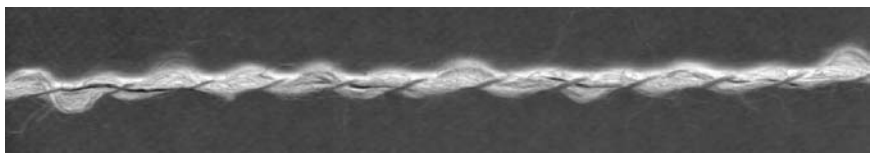
structure is shown in Fig. 6.5. Since a binder is needed to ensure the stability of the structure, the yarn is produced in two stages. Two yarns of widely differing count are plied together, thick around thin, and then reverse bound. Reverse binding removes most of the twist inserted during the first process. It is this removal of twist that creates the wavy profiles, since it makes the effect yarns longer than the actual length of the completed yarn.

The gimp yarns shown in Fig. 6.6 differ from each other in count, material and lustre, just as did the examples of spiral yarns shown in Fig. 6.4. It is clear, too, that the structure is different; the heavier of the two gimps pictured here demonstrates very clearly the fact that an additional yarn has been added to the structure that we saw for the spiral yarns. The textural properties of a gimp are clearly greater than those of a spiral, as well as being different. The finer of these two gimps shows that the effect is less regular, and even perhaps less well-defined.

6.4 Diamond yarn

A diamond yarn is made by folding a thick single yarn or roving with a fine yarn or filament of contrasting colour using S-twist, and cabling it with a similar fine yarn using Z-twist. Multi-fold or 'cabled' yarns may be produced by extending and varying this technique, to produce a wide range of effects. Clearly, a true diamond yarn would show some compression effect upon the thick yarn from the thin ones, an effect which in the interests of clarity

6.7 Diamond yarn structure.



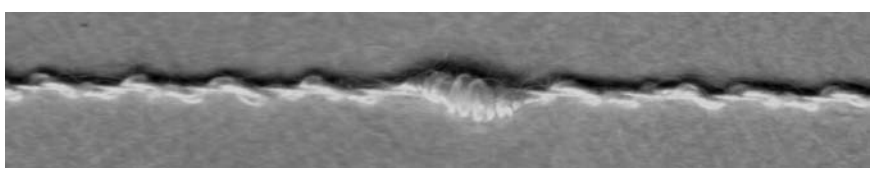
6.8 Diamond yarn.

has been omitted from Fig. 6.7, although the yarn picture in Fig. 6.8 does show this effect to some degree.

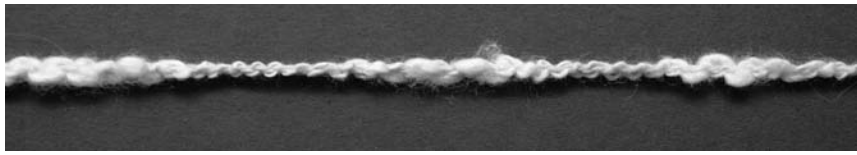
The yarn picture in Fig. 6.8 shows a light roving contrasting with two dark-coloured fine filaments. This makes the contrast in thickness of the two yarn types very evident, which in turn highlights the importance of using a variety of forms of contrast in yarn design. Again, like the marl yarn, this technique produces a yarn that introduces small flecks of colour into the fabric, so that the final overall effect is of heathered or clouded colour. In this case, however, the colour effect is supported by the textural effect introduced by the contrasting weights of the feed yarns used to create the final yarn. This is a yarn that can be very useful to designers seeking to create subtle effects of colour and texture, especially in relatively simple fabric structures. At the same time, it is possible to create a yarn with an exaggerated textural effect, simply by selecting the base yarn and the two cabling yarns in such a way as to ensure a more extreme variation between them.

6.5 Eccentric yarn

An eccentric yarn, as shown in the yarn picture in Fig. 6.9, is an undulating gimp yarn, often produced by binding an irregular yarn, for example a stripe, slub or knop yarn, in the direction opposite to the initial stage, creating graduated half-circular loops along the compound yarn. It produces



6.9 Eccentric yarn.



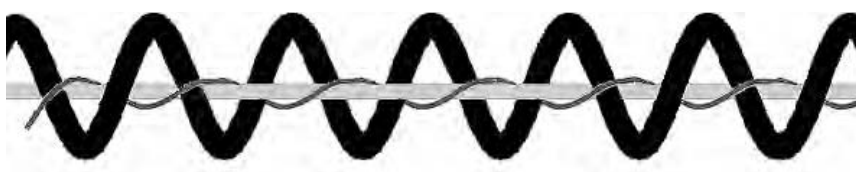
6.10 Heavyweight eccentric yarn.

an uneven but relatively controllable texture, and in fact many of the more exotic yarns used in woven fabrics for ladieswear are of this type. Because it can be produced using one of several different irregular yarns to create the effect, and because the basic morphology is very similar to that of a gimp yarn, no diagram of the structure has been included, since at its most straightforward it would look just like Fig. 6.5. The example shown in Fig. 6.9 is of an eccentric yarn that was made using a relatively low effect overfeed ratio, using a knop yarn as the effect yarn, to create a subtly textured effect. Such a yarn could be included in summer-weight ladies' suitings or even in knitwear. This is a fairly fine yarn, resulting in a light effect, with a strong contrast between the weight of the effect at different points in the yarn. In Fig. 6.10, on the other hand, the whole effect is more strongly textured, but at the same time it does not show the strong contrast in yarn diameter at different points in the yarn that is seen in Fig. 6.9.

6.6 Bouclé yarn

Figure 6.11 shows the basic structure underlying a bouclé yarn. This is a compound yarn comprising a twisted core with an effect yarn (or roving) combined with it so as to produce wavy projections on its surface. To simplify the diagram, the core has been shown as a single bar, rather than as two yarns being intertwined with the effect yarn, as would be the case in reality.

Bouclé yarns belong to the group that also includes gimp yarns and loop yarns. The effect is achieved by the differential delivery of the effect component as compared with the core yarns. The effect component wraps around the core yarns either tightly or loosely according to the amount of



6.11 Bouclé yarn structure.

6.12 Simple bouclé yarn.

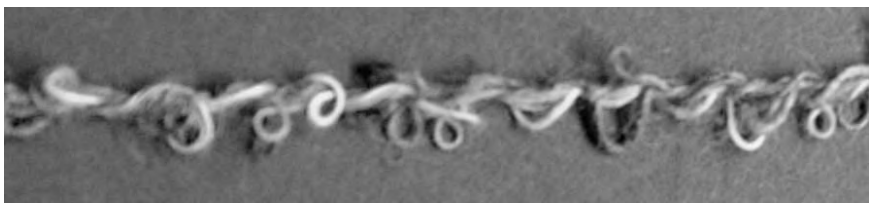
excess delivery and the level of the doubling twist inserted. These wraps are then partially untwisted by the final plying operation, to form curves that are bound by the binder yarn. The effect is similar to a gimp, but more pronounced, with the effect yarn more loosely wrapped around the core. The ground yarns are fed in through grooves in the top front roller, while the effect yarns are fed by the front roller nip. The overfed yarn (the effect) must be fed through the shortest distance.

If irregular bouclé effects are desired, the effect yarn can be brought together with the ground yarn at a point between the front roller nip and the yarn balloon guide (or hollow spindle inlet). This joining point can be a pin, or a rod, or some other yarn-guiding device. The closer the joining point to the front roller nip, the more regular the effect. This is because, as the joining point becomes closer to the front roller nip, the spinning triangle becomes smaller and more stable. This, in turn, means that there is less variation in the yarn. When these yarns are created using a hollow spindle machine, the bouclé effect can be created in a single operation as the effect fibres or yarn and the ground yarn are bound by the binder without twist. The other way in which the bouclé effect differs from the gimp is that gimps always employ yarns as the feed, while bouclé yarns may be made using either yarn or sliver feedstock. Unless the yarns used are very heavy, the yarn effect creates a lighter, crisper feel than the fibre effect.

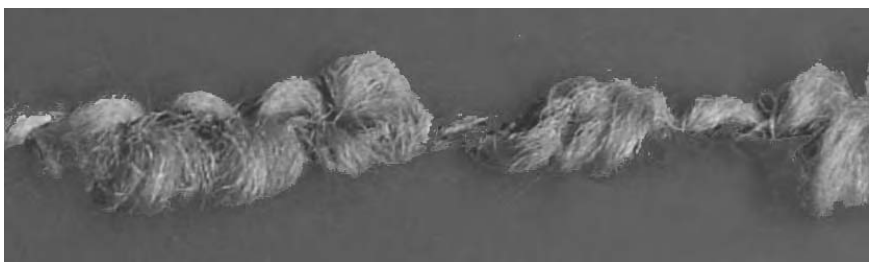
The yarn shown in Fig. 6.12 shows a fibre effect bouclé, where the effect is fine and small to present a textured effect that is not overpowering. This type of bouclé yarn would be used to create a 'woolly', fleecy fabric, such as is frequently used to make or decorate autumn and winter knitwear. The drafting and feed arrangements of the machines most often used to manufacture these yarns also make it possible to create colour blends by drafting differently colour slivers to create the effect. This effect is shown in the bouclé fabric picture in Fig. 6.13. The heavy bouclé yarn used to create this fabric was made using two different colours of fibre feedstock, so the textural effect is enhanced by a colour effect.

The second yarn picture, Fig. 6.14, shows the effect on the yarn of introducing a second feed of a contrasting colour. In this case, in fact, the second effect is a variegated material, which produces again a different effect. This will produce, of course, not simply the textural effect, but in addition it will introduce new colours within the fabric, without requiring that an additional, entirely new yarn be introduced for each colour.

6.13 Knitted bouclé fabric.



6.14 Variegated bouclé yarn.



6.15 Heavy bouclé yarn.

In Fig. 6.15, we show what is essentially the opposite end of the scale – a very heavy, chunky fibre effect, which is made using a sliver comprising a variety of colours. This usually results in a heavily textured fabric surface, with the appearance of a single colour, since the fibres in the sliver are too fine to be seen as having contrasting colours. The use of an intimate blend of colour or fibre, or both, is by no means uncommon in fancy yarns since, above all, the components are chosen for their contribution to the overall effect desired.

6.7 Loop yarn

A loop yarn consists of a core with an effect yarn wrapped around it and overfed so as to produce almost circular projections on its surface.

Figure 6.16 shows the structure of a loop yarn, in this case somewhat simplified by showing the core as two straight bars. In reality of course, the core, which for a loop yarn always consists of two yarns, is twisted, and partially entraps the effect.

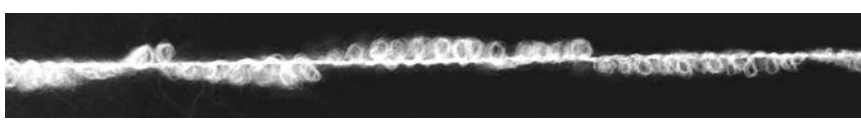
As a general rule, four yarns are involved, of which two form the core or 'ground' yarns. The effect yarn or yarns are usually overfed by 200% or more, and it is important that these be of the correct type and quality: an even, low twist, elastic and pliable yarn is required. Mohair fibre makes particularly suitable yarns and is therefore often used for this purpose. The effect yarn or fibre is not completely entrapped by the ground threads and therefore a binder is needed. The size of the loops may be influenced by the amount of overfeed, the groove space on the drafting rollers, the spinning tension, or the twist level of the effect yarn. Loop yarns may also be made using slivers instead of yarns for the effect.

A loop yarn may be used in one of two very different ways. It may be knitted or woven into a fabric and then brushed or 'teazled' to create a smooth surface: this is one of the primary uses for the mohair loop yarn, which is used to make travel rugs. It can also, of course, be left unbrushed, which provides a very textured fabric surface. In both cases it can be very light and warm because of the air trapped within the structure.

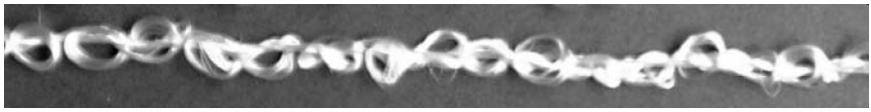
The loop yarn shown in Fig. 6.17 is a fine fibre effect, showing the result of using an ordinary acrylic sliver of appropriate staple, which will create small neat loops, but at the same time, many fibres are not entrapped in the yarn because the feed is not in yarn form. This creates a woolly surface and somewhat blurs the effect of the loops.

The yarn shown in Fig. 6.18 was made using viscose for both the core and the effect. The effect yarn is neither particularly stiff nor particularly springy, and this makes the loops inconsistent both in size and in formation.

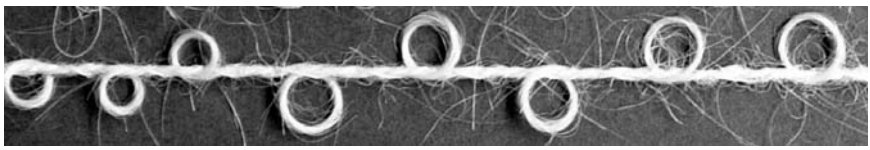
6.16 Loop yarn structure.



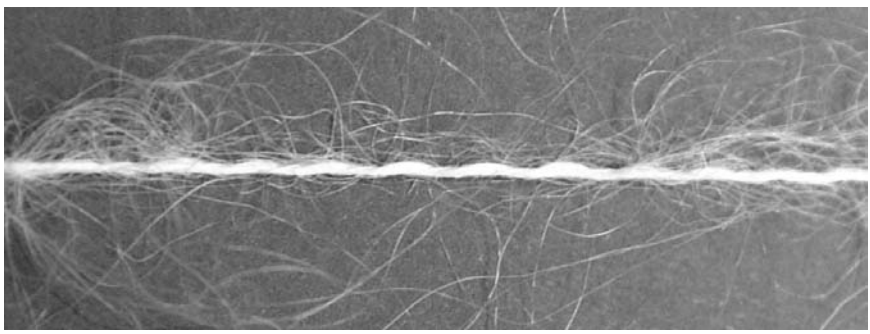
6.17 Fine loop yarn.



6.18 Viscose loop yarn.



6.19 Mohair loop yarn.



6.20 Brushed loop yarn.

Rather than creating neat circles, they fall lengthwise along the yarn to form ellipses. This would certainly create an interesting texture in the fabric, but it does not have the appearance of a classical loop yarn.

The yarn in Fig. 6.19, which shows mohair loops on a worsted base, has neat loops, not identical in size or spacing, but certainly consistent in their approximate sizes, and with the loops neatly separate in appearance. This demonstrates clearly the benefit of using mohair in loop yarn formation, when it is desired to create an effect which requires distinct loops rather than simply an exaggerated bouclé. As the loops are clearly isolated by lengths that appear simply to be plain yarn, the fabric will not have the blurred effect of a bouclé or of the much closer loops that are shown in Fig. 6.17; instead, the loops are likely to show clearly on the fabric surfaces.

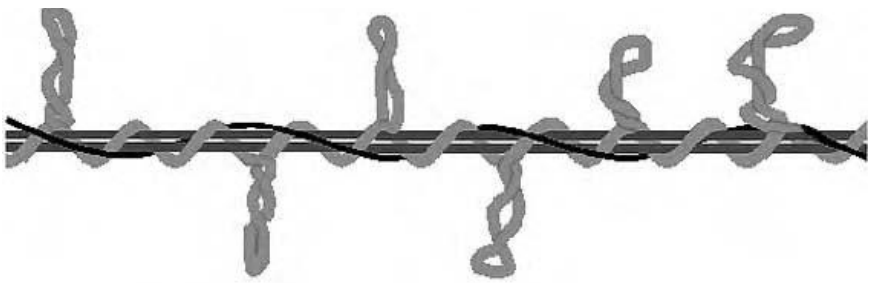
The yarn in Fig. 6.20 shows the effect of brushing a mohair loop yarn – a fluffy, but smooth-feeling yarn. The result here is a fabric that presents the sensation of having a surface that is removed from the actual base fabric. This is because the base fabric is simply the fabric produced by the core yarns, while the surface that is touched is the surface of the brushed and

disentangled loops, which often feels rather detached from the true surface. This effect, too, blurs and softens any pattern in the fabric, and it can provide a useful textural contrast with other garments in an outfit.

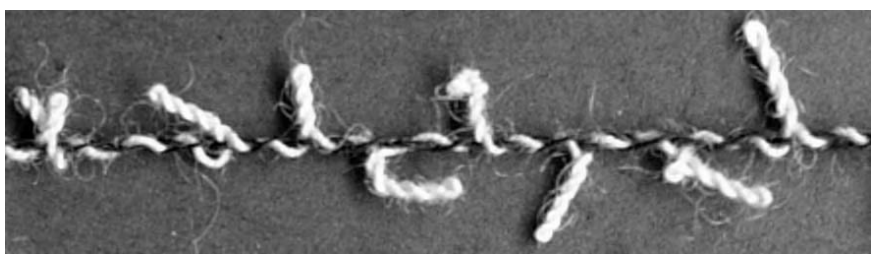
6.8 Snarl yarn

Like the loop yarn, the snarl yarn is based around a twisted core, although, again for the sake of simplicity, the core has been shown in Fig. 6.21 as two parallel bars. A snarl yarn is one which displays 'snarls' or 'twists' projecting from the core. It is made by a similar method to the loop yarn, but uses as the effect a lively, high twist yarn and a somewhat greater degree of overfeed. The size and frequency of the snarls may be controlled by careful control of the precise details of overfeed and spinning tension, and by the level of twist in the effect yarn. The snarl yarn may be used to produce the effect of a sparse and shaggy fur, if used in the entire fabric. It may also produce an effect somewhat akin to short fringing, which is particularly effective when it appears in only some sections of a garment.

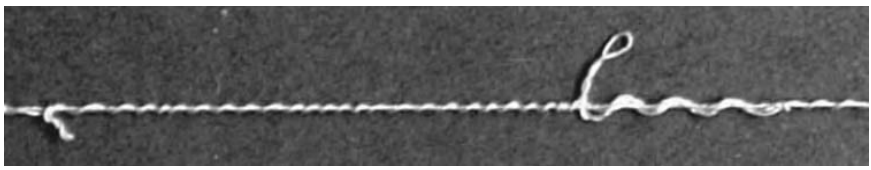
The snarl yarn shown in Fig. 6.22 is made using a combination of a white worsted yarn to create the effect, while the core yarns and the binder are of black cotton. In a fabric, this would contribute to a flecked and shaggy



6.21 Snarl yarn structure.



6.22 Worsted snarl yarn.



6.23 Acetate snarl yarn.

6.24 Metallic snarl yarn.

appearance, but in the yarn form we see here it has the added advantage of making the structure of the yarn much clearer and easier to see.

The acetate snarl yarn shown in Fig. 6.23 is a very different matter. It is a considerably finer yarn than the worsted, and the snarls are so long that they have become partially entrapped by the binder during the final binding process. This creates the effect of a slub associated with each snarl. Indeed, some of the snarls have been so entangled in the core yarn that, in effect, the appearance in the fabric would be of sparse snarls interspersed with fine slubs.

In Fig. 6.24 (also seen on Plate 1, example F), the yarn is a combination of a structural and a material fancy yarn, in that a snarl yarn has been made using a metallic component in the effect yarn. This offers the opportunity to make the metallic effect subtle rather than overwhelming, while at the same time improving the comfort of garments made involving these yarns. In the case of the yarn in Fig. 6.24, the garment is likely to glint subtly in the light, rather than present an all-over shine.

6.9 Mock chenille yarn

A mock chenille does not at all resemble a true chenille yarn (Fig. 6.19) in its appearance as a yarn, but when it is woven into a fabric it will give an effect very similar to that of a chenille. It will, however, seem much harsher in handle because it does not involve cutting the loops of the effect yarns and so it lacks the 'velvety' feel. It is in fact a doubled corkscrew or gimp yarn, and it is made by doubling together two or more unbalanced

corkscrew or gimp yarns in the reverse direction with sufficient twist to form a balanced structure.

6.10 Knop yarn

A knop yarn is one that contains prominent bunches of one or more of its component threads, arranged at regular or irregular intervals along its length, as shown in very simplified form in Fig. 6.25.

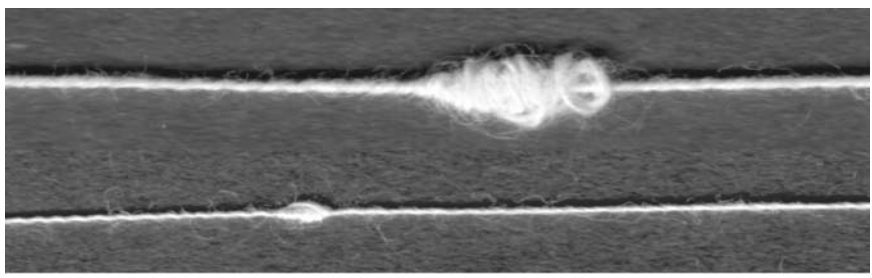
It is usually made by using an apparatus that has two pairs of rollers, each capable of being operated independently. This makes it possible to deliver the foundation threads intermittently, while the knopping threads that create the effect are delivered continuously. The knopping threads join the foundation threads below the knopping bars. The insertion of twist gathers the knopping threads into a bunch or knop. The vertical movement of the knopping bars determines whether the knop is small and compact or spread out along some length of the yarn. The apparatus is shown in Fig. 7.4.

Figure 6.26 shows two simple knop yarns in widely differing counts. Both demonstrate the somewhat slub-like effect of the yarn, but in both examples it is clear that a knop is made of coiled yarn, rather than being a fibrous mass like a slub.

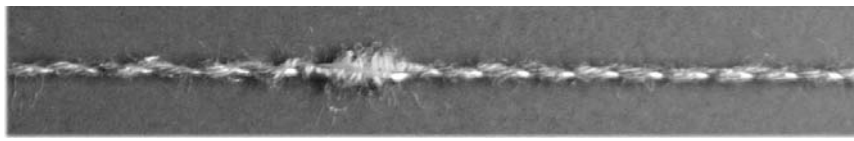
The yarn shown in Fig. 6.27 is in fact a short section of a two-coloured knop yarn, and has been included because it shows the fine reverse binding thread, which may be included to secure the knops. This binding may also be used to produce an additional spiral between the knops.

Superfine, long knop yarns (Fig. 6.28) are used often to produce a 'lost and found' pinstripe in fine suitings, where sometimes the knop will be

6.25 Knop yarn structure.



6.26 Knop yarns.



6.27 Knop yarn showing binding thread.

6.28 Very fine long knop yarn.

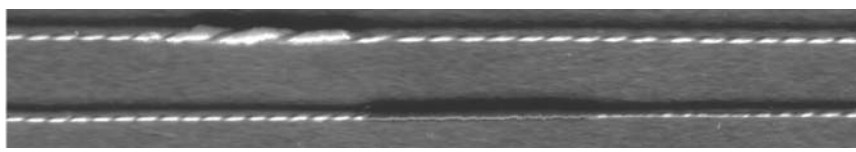
coloured differently from the rest of the yarn, producing an occasional flash of colour in an otherwise plain fabric. It is more usual, however, for the yarn to be somewhat heavier, this certainly being easier to make. In this second case, the yarn is used to introduce an effect similar in outward appearance to that of a slub, except that the effect is created of yarn rather than from fibre and is consequently somewhat stiffer and harder in feel.

6.11 Stripe yarn

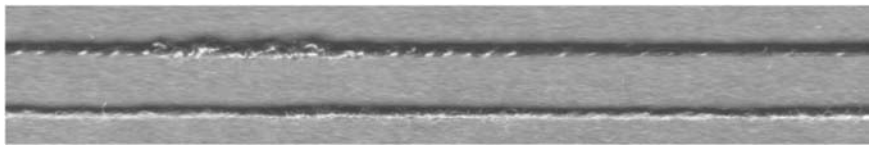
A stripe yarn contains alternating elongated knops. It can be made by two methods:

1 As a knop with a moving knopping bar to spread the surplus thread.
2 By alternate fast and slow delivery of one or more of its component threads and a constant rate of delivery of the base threads. The threads join below a stationary bar to form the intermittent stripes.

The stripe yarn shown in Fig. 6.29 alternates dark and light threads, creating a marl in the lengths of yarn between the knops, and distinctive dark knops interspersed with lighter ones. Note that the change in dimension of the knop relative to the marl sections is much less than it is in the plain



6.29 Stripe yarn.



6.30 Striped suiting yarns.

knops shown in Fig. 6.26. These yarns, too, would be suitable for creating a 'lost and found' pinstripe effect in a relatively fine fabric.

The example in Fig. 6.30, which is of yarns intended for inclusion in a worsted suiting fabric, shows clearly that with a suitable choice of feedstock it is possible to create the subtle effects already described as being among the uses of the stripe yarn based on the knop structure. It also shows that, in some cases, the coloured knop or stripe can be of almost the same dimensions as the base yarn, and therefore that it need not offer the additional friction of a thick place in further processing.

6.12 Cloud or grandrelle yarn

The cloud or grandrelle yarn is made using the same apparatus used to create knop yarns. The two threads of different colours used to create the yarn are manipulated in such a manner that each thread alternately forms the base and cover to 'cloud' the opposing thread. It is made by alternate fast and slow deliveries from two pairs of rollers. Because the yarns alternate in forming the base yarn, no dedicated core yarn is required. The structure is shown in Fig. 6.31. The 'changeover point' may be sudden, in which case one colour is replaced by the other in a short distance, or it may take place gradually, producing a blended colour appearance.

6.31 Cloud yarn structure.

6.13 Slub yarn

A slub yarn is one in which slubs have been deliberately created to produce the desired discontinuity of effect. Slubs are thick places in the yarn. They can take the form of a very gradual change, with only a slight thickening of the yarn at its thickest point. Alternatively, the slub may be three or four

6.32 Fine ground slub yarn.

times the thickness of the base yarn, and that thickness may be achieved within a very short length of yarn. Since the structure is simply one of a gradually thickening and then tapering cylinder, a diagram has not been produced. The yarn pictures should give a clear enough impression of the structure of the yarn itself (see, for example, Fig. 6.32).

The slub effect can be produced by a variety of means, each offering its own benefits and challenges. The finer slubs can be used simply to introduce a subtle but pleasing variation in the surface appearance of a plain fabric, and are used often for this purpose in both upholstery and apparel fabrics. On the other hand, the heavier slub effects produce stronger variations in the fabric surface, and can become a design element in their own right. The yarns are used both in knitted and woven fabrics, although it is worth recalling that, until very recently, most of the methods for producing slub yarns carried the penalty that the thick place in the yarn was followed immediately by a thin place, rather than by a simple return to the basic yarn count being spun. This, in turn, creates a weak place in the yarn, and slub yarns have needed very careful balancing of feed and delivery speeds in order to avoid the production of yarns too weak for processing.

A variety of methods are available for producing slub yarns, and the resulting yarns may be divided into the following classes:

- Slub yarns produced at the spinning frame are known as spun slubs. They can be produced by blending fibres of different dimensions, as for example woollen slubbing with worsted top sliver – the imperfect fibre control during drafting produces randomly distributed slubs of varying size.
- Plucked or inserted slub yarns are composed of two foundation threads and periodic short lengths of straight-fibred materials that have been plucked from a twistless roving by roller action. This method tends to give a neater, cleaner appearance than is achieved in producing spun slubs.
- An alternative method is to modify the spinning frame such that the intermittent acceleration of the rollers causes varying degrees of draft to be applied. Such a slub is shown in Fig. 6.32: in this case it is a relatively fine yarn with a fine and fairly long slub. This method might also be used to produce a slubbed roving from which a yarn could be spun using constant draft; of course the yarn created in this way would have very long slubs that become apparent only gradually.

- A further method would lie in the injection of additional material into the drafting zone. The setting must be varied over a very long repeat to avoid patterning the material. This method allows the production of 'flake' (very long slub) yarns.
- Finally, recent developments in open end spinning have made it possible to create rotor spun slub yarns.

As the third method suggests, slub yarns can be produced during drafting on the ringframe. One way of achieving this is to vary the speeds of the rollers to cause irregular fibre flow and thus an irregular yarn. This produces 'ground slubs', which are slubs that have the same fibre composition as the yarn. A ground slub yarn is shown in Fig. 6.32. It can be seen that this is formed of a single structure; no additional yarn or process has been involved in creating the yarn. Such a yarn, while having the distinct merit of simplicity, being easy to understand and straightforward to set up, can prove to be problematic in use, since the slubs take up very little twist and become weak spots in the yarn.

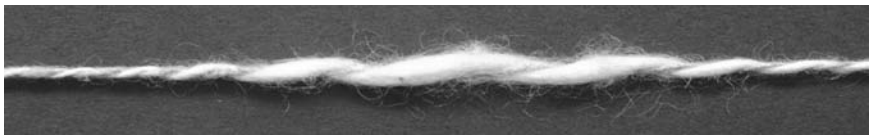
'Spun slubs', as described above, can be created by mixing fibres of different properties, in particular fibres having different staple lengths. The differing behaviour of these fibres during drafting then produces the irregular slub effects. Again, the final spinning process is simple and easy to set up, but in this case it is at the expense of being required to produce a sliver or roving that blends these differing yarns.

It is possible to create an effect similar to the spun slub, but far more exaggerated, by the injection method, which is described above for the production of 'flake' or 'flammé' yarns. These are particularly long, heavy slubs. The effect fibre rovings can be injected into the front drafting zone to produce slubs that have a different fibre composition to that of the ground yarn.

Slubs can also be produced by adjusting the card settings so that the fibre stock is 'rolled' to form nepps or slubs. This is simply the opposite of the normal carding action. It is possible to produce slubs by varying either the cylinder-doffer setting or the doffer speed. However, this technique is rarely employed because it is very difficult, and therefore time consuming, to alter the speed of these large cylinders. A better yarn can be produced by using fibres that have good cohesion between them.

A flake yarn can be produced at the condenser of a woollen card by introducing random lengths of effect slivers (flakes) into the condenser calender rollers or on the condenser doffer. These slivers are prepared separately on another card. The flakes should not be too thick compared with the ground yarn; otherwise it will be difficult to spin and wind the yarn.

The yarn shown in Fig. 6.33 is, in effect, a combination yarn. The overriding visual effect is that of a slub yarn, but an additional binding process



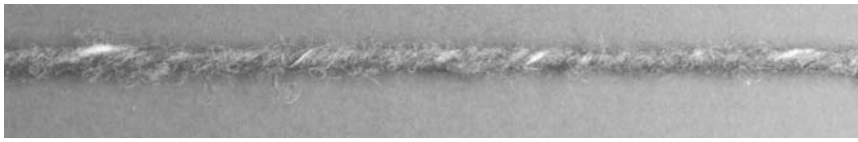
6.33 Bound slub yarn.

has been applied, which produces the effect of a spiral slub. This also demonstrates the usual appearance of a slub yarn that has been produced using a hollow spindle machine, rather than on a ringframe.

6.14 Nepp yarn and fleck yarn

The basic method for nepp and fleck yarns is the same in either case: the differences lie in the degree to which the additional material (shown in Fig. 6.34) is affected by the carding process and in the choice of fibre used in the additional material. The effect is produced by adding balls (clumps) of effect fibres to the feed or at a later stage during carding, for example, at the last worker-cylinder contact point. These balls of effect fibres may vary in type, staple length and colour. They may also be a mixture of various types. The settings of the card following the introduction of the nepps will have to be wider than normal to ensure that the nepps are not carded out. These nepps or nubs will then appear randomly along the yarn. Structurally,

6.34 Acrylic flecks and nepps.



6.35 Fleck yarn.

these yarns are plain in appearance – in this case it is the colour effect that makes them 'fancy'. A fleck yarn is shown in Fig. 6.35.

When more than one type of effect fibre is used, it is essential that the fibres be thoroughly mixed before being introduced to the card. This mixing action tends to result in harder nubs, which will then tend to maintain their integrity to a greater degree, resulting in a spotted, rather than streaked effect. The proportion of effect fibres to the base fibre needs to be determined (from the size and amount of the effects planned), to enable the appropriate quantity of effect fibres to be added to the card in order to create the desired effect, given the production rate of the card. The nubs in the card web will disrupt the action of the condenser and the drafting arrangement in spinning. Some nubs may be lost during processing, and so the initial addition of material must make allowance for that possibility as well.

6.14.1 Nepp yarn

These are made on the woollen system. They show strongly contrasting spots on the surface of the yarn, which are made by dropping in small balls of wool at the latter part of the carding process. The nepps may also be incorporated in the blend, with the carding machine set to ensure that these small lumps are not carded out.

6.14.2 Fleck yarn

This yarn presents a mixed appearance, combining spotted and short streaky effects, due to the introduction of a minority of fibres of different colour and/or lustre; it looks similar to the nepp yarn, but some of the nubs will have been slightly opened out during carding, which creates the streaky effect.

6.15 Button yarn

The 'button' is an intermittent effect, created by a sudden pause in the progress of the core yarns that allows a build-up of the effect material, usually in this case a sliver or roving, since most button yarns are created

6.36 Button yarn.

6.37 Fine button yarn.

by fibre feedstocks. Since fibre effects are relatively straightforward to show in photographs, a diagram has not been included for this yarn. While in yarn form it can offer a truly dramatic effect, it is less than straightforward to process into fabric, and consequently in practice it is usually found in its more discreet manifestations. The exception to this is, of course, in hand knitting yarns, since it can be expected that a hand knitter will be able to devote time and care to achieve a successful result. The button yarn shown in Fig. 6.36 was made using a hollow spindle machine, with two slivers fed together, and a relatively small 'button'. It will create a strongly textured fabric, whose overriding colour is a blend of the two colours used in the sliver effect materials and the colours used for the core and binder yarns.

The button yarn shown in Fig. 6.37 again shows two colours used to make the yarn. In this case, the sliver shows a longer average staple length than in those used to make the yarn in Fig. 6.36, resulting in a 'fluffier' yarn. In addition it appears that the darker feed material is in fact a yarn. Since it is not desirable to control too precisely the appearance of intermittent effects, lest the eventual fabric be subject to patterning (which is described in Chapter 7), it is a matter of chance that in this case the darker material

6.38 Dramatic button yarn using yarn feedstock.

has come to the fore as the button is created. In Fig. 6.38, on the other hand, the feed material used is a highly coloured and extremely shiny viscose yarn, while the core and binder yarns are dark in colour and dull in surface. A fabric made using this yarn would appear to have a plain and dull background, with prominent, highly coloured spots decorating its surface.

6.16 Fasciated yarn

A fasciated yarn is a staple fibre yarn that, by virtue of the method used in its manufacture, consists of a core of parallel fibres bound together by wrapper fibres. The name derives from the 'fasces', bundles of rods bound together with an axe in the middle, which in ancient Rome were the symbol of a magistrate's power.

Yarns made under the airjet spinning method are of this structure, although they hardly class as 'fancy' in themselves. The yarns produced under the hollow spindle method are also frequently described as fasciated, since the binder is applied to an essentially twistless core of parallel fibres.

6.39 Fasciated yarn.

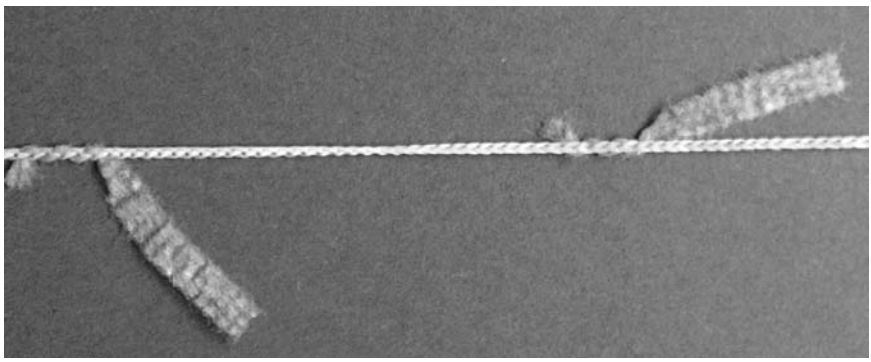
The yarn shown in Fig. 6.39 is a fasciated yarn made using the hollow spindle process. It is possible to see the fibres that have escaped and the dark binding thread that contrasts with one of the two slivers used as feedstock in making the yarn.

6.17 Tape yarn

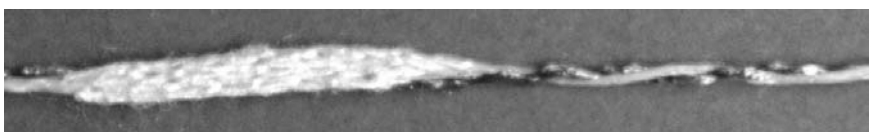
'Tape' yarns may be made by a variety of processes; braiding, warp knitting and weft knitting being among them. In recent years, these materials have become better known, especially in fashion knitwear. It is also possible to use narrow woven ribbons, or narrow tapes of non-woven material, or slit film, in the same way. With a wealth of possible structures available, it has not been feasible to do more than simply assemble a series of yarn pictures to offer a glimpse of the variety that is already being produced.

In Fig. 6.40, (also shown on Plate 1, example E) the tape yarn is made using a combination of a filament support and a metallic embellishment, and this produces a broken and speckled appearance. Not soft enough to

6.40 Metallic tricot tape yarn.



6.41 Non-woven inserts in tricot tape yarn.



6.42 Combination yarn.

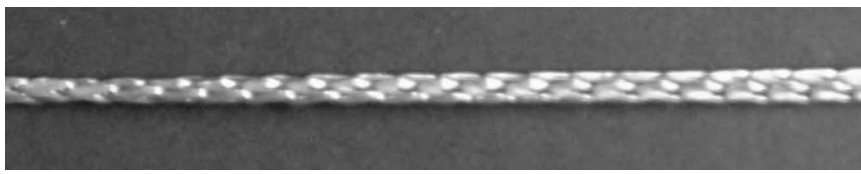
be comfortable next to the skin, this yarn could only be used in a fabric intended to be lined, or as surface embellishment on an unlined item. In Fig. 6.41, a relatively plain tricot tape or cord has been decorated using short lengths of a nonwoven material. It is clear that this additional material has been incorporated into the structure for a sufficient distance to ensure that it will not be able to work its way out of the yarn. This yarn would produce a sparsely shaggy 'fur-like' appearance in fabric form.

The yarn shown in Fig. 6.42 is, in effect, a combination, showing what can be produced by combining several yarns together. It consists of an intermittent chainette combined with a viscose spiral yarn, and is bound by a plain cotton yarn, to create a variety of surfaces in a single length. Although the fact is not demonstrated in the small section shown here, the viscose spiral is knopped, adding yet another variation to the yarn.

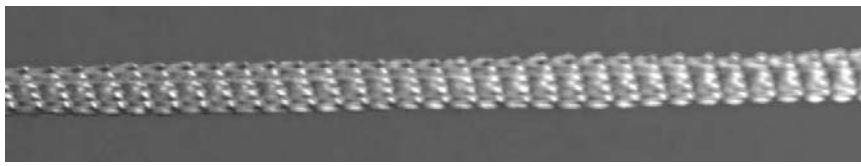
6.18 Chainette yarn

'Chainette' yarns are made by a miniature circular weft knitting process, often using a filament yarn and a ring of between 6 and 20 needles. They have been seen in small quantities for many years, and are being used extensively in fashion knitwear.

The yarn picture in Fig. 6.43 shows one of the heavy, rounded chainette yarns. It was made using few needles, but with a relatively heavy feed; in this case, a heavy and lustrous continuous filament yarn was used. The second yarn picture, Fig. 6.44, shows a chainette being used to create a tape or ribbon yarn – a finer filament yarn was used than in the first case, and it was knitted on a greater number of needles, to produce a larger tube, which was then ironed to give the flat, tape-like effect. These knitted tape yarns can be used to good effect in knitted garments, although care needs to be taken to ensure that the stitches of the yarn are not snagged by the needles knitting the garment.



6.43 Heavy round chainette yarn.



6.44 Ribbon chainette yarn.

6.19 Chenille yarn

Figure 6.45 shows the basic structure of a chenille yarn. It consists of a cut pile which may be made of a variety of fibres helically disposed around the

6.45 Chenille yarn structure.

6.46 Chenille yarn.

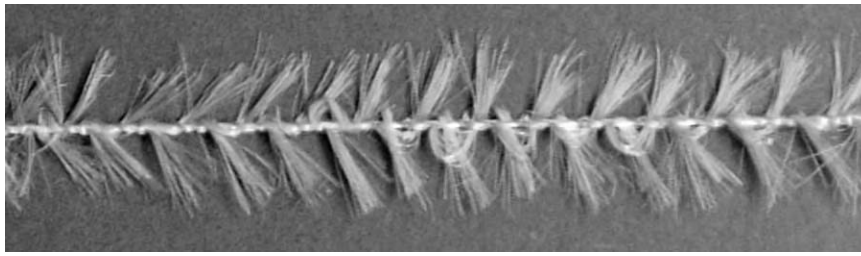
two axial threads that secure it. Chenille yarns are traditionally used in the manufacture of furnishing fabrics and trimmings, fashion knitwear, and as decorative threads in many types of broad and narrow fabrics. There are several ways of making them. Figure 6.46 (also shown on Plate 1, Example C) shows a basic chenille yarn that has alternated two colours in the pile, to produce a striped yarn. This in turn will produce a speckled fabric, or at least one with the appearance of broken colour.

The original tufted weft yarn was made by weaving a fabric on a loom (known as a weft loom) in which the warp threads are arranged in small groups of 2 to 6 ends, which interlace in a gauze or cross-weaving manner, the groups being a definite distance apart to suit the length of pile desired. The weft was inserted in the normal way, each pick representing a potential tuft. The woven piece was cut into warp-wise strips that were then used as weft yarn in the production of chenille fabrics. This was a time-consuming method of production, no longer used to any great extent. It is described in greater detail in Chapter 7.

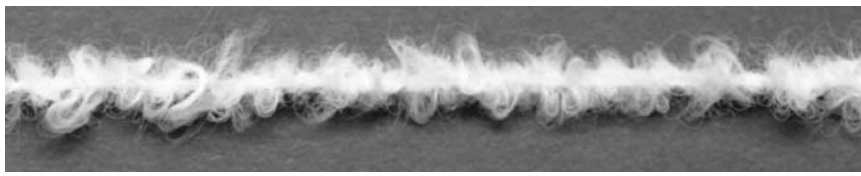
The newer yarn which is used in knitted and woven fabrics is the product of a chenille machine. The pile yarn is introduced between and at right angles to a pair of axial threads at the point at which these axial threads engage as they are twisted together. The pile yarn is then cut, and the yarn is twisted on the ordinary ring system to produce the familiar round and 'furry' yarn. In order to reduce subsequent shedding of the tufts (a fault to which these yarns are susceptible), a thermoplastic yarn is often incorporated, and the application of heat at the appropriate point in the process (before the yarn is wound onto a package) enables the yarn to be 'set'. This process is described in more detail in Chapter 7, the section on manufacturing techniques.

A chenille yarn has a very definite 'nap' – just like the velvet fabric that in some ways it resembles. This becomes clearer when, instead of the dense pile to which we are accustomed, we see a chenille that has a sparse and strongly differentiated pile, as in Fig. 6.47 (also shown on Plate 1, Example B). In this picture we can see very clearly the orientation of the effect yarns in relation to each other and to the core.

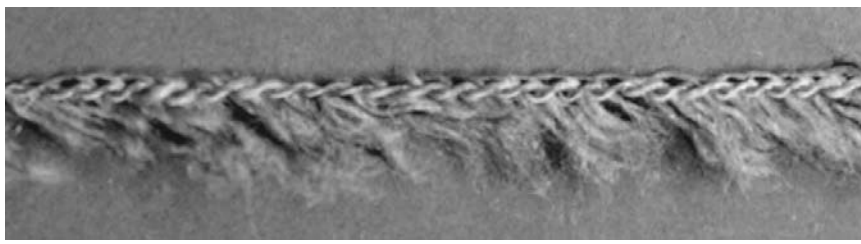
It is also possible for a yarn resembling chenille to be produced by electrostatically flocking an axial yarn prepared with an adhesive. Such a yarn is not of very high quality, nor is it particularly durable. This, too, is briefly described in Chapter 7 on manufacturing techniques. It is also possible to



6.47 Sparse chenille yarn showing nap.



6.48 Airjet textured 'chenille-type' yarn.



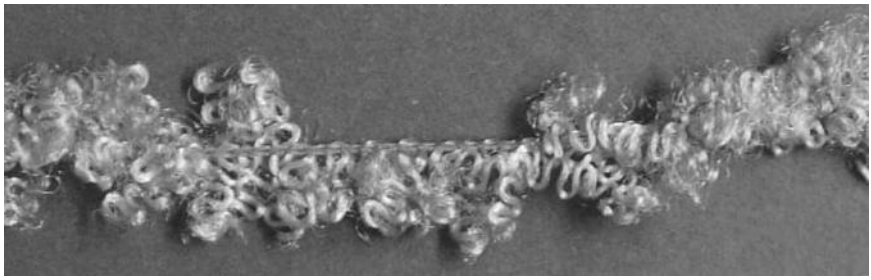
6.49 Feather yarn.

create a yarn bearing some resemblance to a chenille using the airjet texturing process. Clearly, the structure is not the same but, as it is used for the same applications, it can fairly be included in this section (Fig. 6.48).

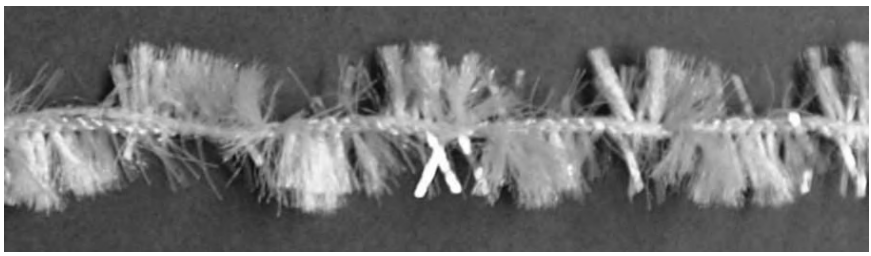
The chenille process, and a variant of warp knitting that produces a similar effect, are being used to produce very shaggy and lofty pile yarns, and 'feather' yarns which show the effect in one direction only. A feather yarn is shown in Fig. 6.49: in this case, the pile is relatively short, but the looped structure at the core of the yarn can be clearly seen in the picture.

In Fig. 6.50 (also shown on Plate 1, Example A) , a yarn is shown that has a curly pile instead of the familiar straight pile. This will produce a fabric having an elastic handle, since it will be possible to compress it quite considerably.

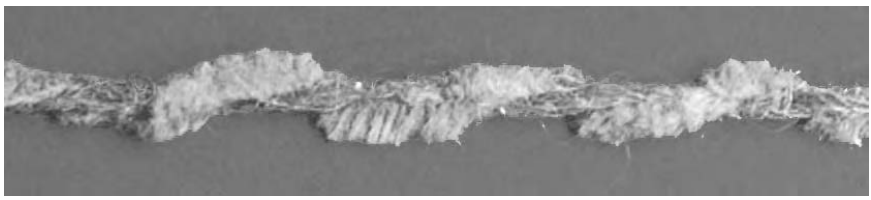
It is also possible to use a combination of feeds in creating a chenille yarn, as demonstrated by the yarn shown in Fig. 6.51. The basic material in



6.50 Curly chenille yarn.



6.51 Tricot chenille yarn.



6.52 Chenille spiral yarn.

the yarn is synthetic filament, but extra sparkle and shine has been added by including a slit film with a mirrored surface. The yarn has then been twisted with an additional plain filament to ensure that it becomes rounded, in this case producing a scalloped appearance rather than the simple velvety cord that we expect of a chenille yarn. It has a relatively long pile and would be better used as an accent, rather than to form an entire garment or fabric. It is shown in colour on Plate 1, Example D.

Chenille yarns may also be made intermittently to produce a discontinuous effect, or combined with other yarns to produce a broken colour effect that benefits from the subtle variations imparted by the pile of the chenille. In Fig. 6.52, for example, a chenille yarn has been combined with a plain

yarn to create a textured spiral yarn that will produce a variation in texture and colour throughout the fabric in which it is used.

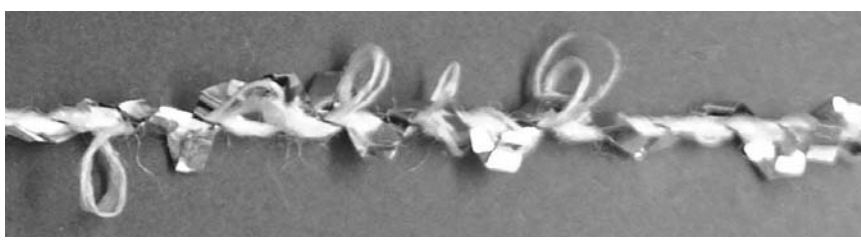
6.20 Cover yarn

A cover yarn is one in which a yarn at the core is completely covered by the fibre or yarn wrapped around it. It is familiar to embroiderers, because most metallic embroidery threads take the form of a filament core with a metallic thread or flat ribbon wrapped around it (as indeed has been the case for several thousands of years – the Romans used gold threads made in this way) but the method is most commonly used to cover elastomeric yarns, which would otherwise be extremely uncomfortable to wear.

6.21 Metallic yarn

Many metallic yarns are formed of slit laminated films, wrapped around a core, or lightly bound with a fine filament binder.

Chenille, cover, and laminated yarns are usually of even diameter, the effect being achieved by the surface of the yarn. This may be formed of cores, wrapped with slit film yarns, or by the projecting fibres familiar in the chenille yarn that has enjoyed a significant renaissance in recent years. Occasionally, the slit film threads may be used flat, which heightens their effect, although they usually require the support of a filament to increase their strength. Flat slit films may also be used as components in other fancy yarns. An example of this is shown in the picture of a complex bouclé yarn, Fig. 6.53, which involves a variegated cotton yarn and a flat film as the effects, using a filament to bind the two effect yarns onto the core yarns. This is shown more clearly on Plate 1, Example G.



6.53 Complex bouclé yarn showing use of metallic film.