P I L E W E A V E S - 1.

C O R D U R O Y.

All pile weaves require some additional operations when compared with flat weaving, and many of them additional equipment as well. Corduroy is one of the simplest, as far as weaving is concerned, but the cutting of the pile takes more time than in other methods.

Corduroy belongs to weft-pile fabrics. It means that the pile is first woven as weft before it is cut. The pile itself after cutting is really neither weft not warp since at least theoretically its direction is perpendicular to both.

What is peculiar about the pile in corduroy, is that the depth (or height, or length) of the pile can be increased only at the expense of its density. The longer the pile the further apart it stands, and the more the background becomes visible. A nother peculiarity of this weave are rows or ridges of pile running always parallel to the warp. We can partly eliminate them by staggering the pile, but then the cutting becomes very difficult.

Thus the weave: 1-st - cannot produce a thick pile, 2-nd - the ground is often if not always visible, 3-rd - the pile is formed in ridges. This makes it unsuitable for rugs except very light ones. The classical application of corduroy were fabrics for clothing, rather fine and expensive to make ("corde du roi" = corded fabric of the king). These are rather beyond the reach of a handweaver, since the cutting of fine and short floats requires special machinery.

The same properties however which make corduroy unsuitable for heavy rugs, make it desirable in cases when the fabric has to be washed. Most pile fabrics take a long time to dry, because of the lack of air circulation in the pile. Corduroy is not so bad from this point of view and can be used such different articles as bath mats and place mats. Then it has one more peculiarity: it drapes well in the vertical direction (along the pile ridges), so that it makes good hangings, curtains, bedspreads etc.

One more advantage of this weave is that the pile appears only where it is cut, not like in velvet, or chenille. Thus by cutting only a part of the surface of the fabric we can produce patterns.

If we do not start the description of the weave with drafting, it is because corduroy can be woven on practically any draft which produces floats of any length in weft. Floats which skip 5 warp ends can be already used for making the pile. The only condition is that the weft besides forming floats must tabby with the warp for a short stretch between the floats. Thus nearly all overshot drafts (except overshot on opposites), spot weaves - particularly all-over spots, lace, huck (10x10 or 14x14), waffle, M's-and-O's, and many other can be used for weaving corduroy. The treadling is changed, of course, and the weft will be different than usual.

There are however special drafts, better adapted to the requirements of the weave, and it is only the latter that we shall discuss. Even so their number is rather high and we shall limit ourselves to a few typical variations.

Regardless of the draft, the principle of forming the pile is always the same and it is shown in fig.1. In A we have a cross-section

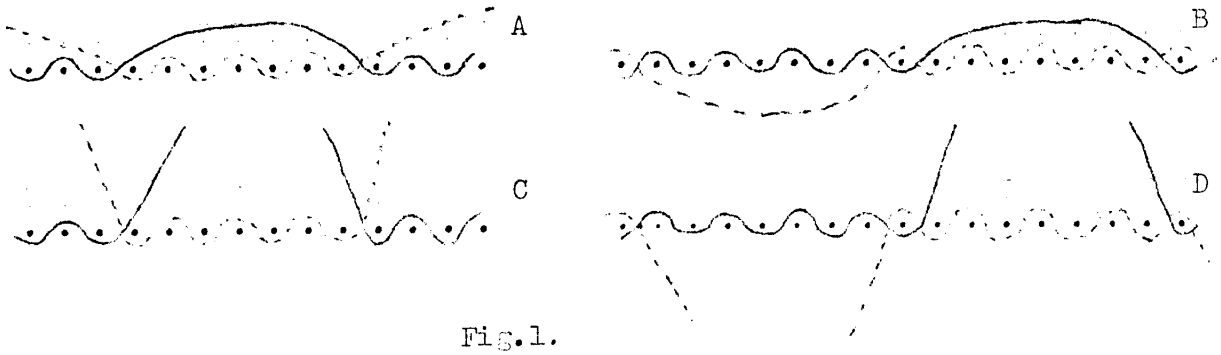

Fig.1.

of the fabric parallel to the weft, before the pile is cut, and in B - after. It becomes obvious from the drawing that the height of the pile is equal to one half of the distance between two rows. The pile may be all on one side as in fig.1 A and B, or on both sides as in C and D. However with all other factors remaining unchanged the pile on one side will be twice as thick as in the letter case. The pile may be of the same length on both sides, or not. Finally we may have short and long pile on the same side. We shall return to this last case since it presents the best solution of the problem of covering the ground.

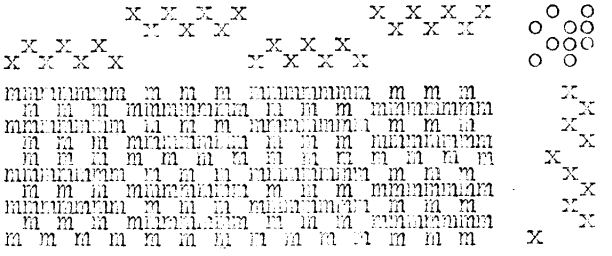

Fig.2.

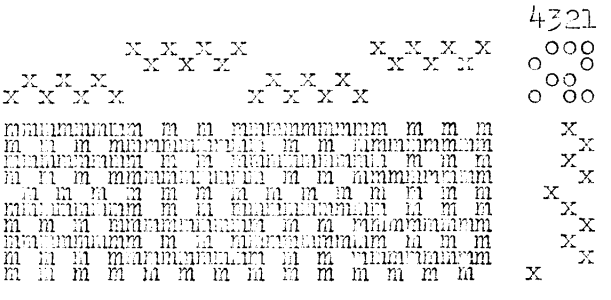

Fig.3.

Fig.2 shows a typical draft for corduroy. The draw-down shows floats of 7, with 3 repeats of tabby between rows of floats. The tie-up is for a counterbalanced loom and it this case the distinction is important since usually the floats are cut on the loom, and if they were formed on the lower surface of the fabric, they could not be cut until after weaving.

The same draft with slightly different tie-up can give longer floats (fig.3), but at the same time the pile is not so well interwoven with the ground, which means a weaker fabric. It may be noticed that in both cases we use a binder on treadles 3 and 4. This binder is necessary to cut the floats in the warp which are formed at the back of the fabric, and to hold the fabric together after the floats in weft are made into pile. In practice the shots of pile weft (treadles 1 and 2) come much closer together than on the draw-down, and consequently the binder may be used not so often.

We have to distinguish here between the yarn used for the pile weft, the binder and the warp. The pile weft is comparatively heavy, soft, and with only a light twist. The warp of medium weight because a very fine one would not hold the pile well enough. The binder very fine and strong. Since the ground is visible here, the colour of warp and binder should of the same shade as the pile weft, or slightly darker. As an example: 8/2 cotton for warp set at 20/",

16/2 cotton for binder, and 4/2 wool (1120 yds/lb) for pile. This will give a pile about 3/16" deep.

If longer pile is wanted we extend the halves of one repeat of the threading draft as in fig.4. Here the distance between two rows of pile will be about 3/4" and the length of the pile - 3/8".

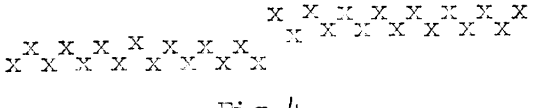

Fig.4

For long pile another draft may be preferable, because in the draft on fig.4 a too large portion of the pile weft is woven as tabby. This part is lost since the fabric doeas not need to be that strong. Fig.5 shows another draft where the tabby part is much shorter.

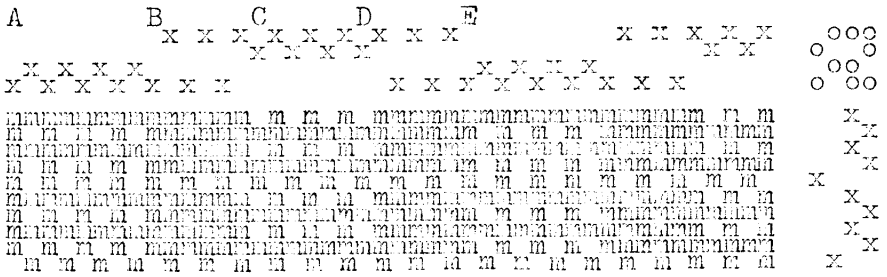

Fig.5

To compensate for this we shall have to use more shots of binder, and only experiment will show how many more. The draft such as given in fig.5 is only an example and the parts: A-B, B-C, C-D, and D-E may be made shorter or longer. The longer the parts B-C and D-E, the longer the pile, and the more economical the draft, but at the same time the fabric becomes very weak unless plenty of binder will reinforce it

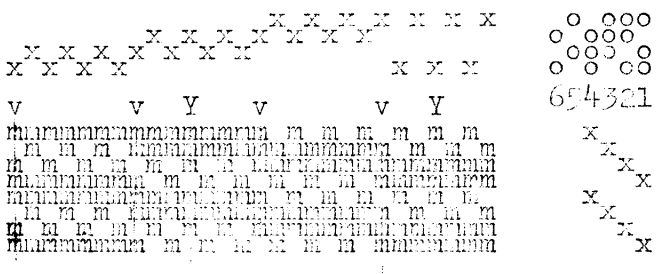

Fig.6

If we want the pile to be more uniformly distributed we can try the draft on fig.6. Here the binder (tr.:5,6) is optional since the tabby portions in other sheds overlap. But the cutting of pile presents a problem. If we cut in "v" we have pile of even length, but the cutting itself is very difficult. If on the other hand we cut in "Y", none of the floats is cut in its center and consequently we have pile of two different sizes: one nearly 3 times as long as the other. The diagonal which shows on the draw-down is hardly visible in practice, and in any case it can be broken by treadling 1324 instead of 1234, or 4321.

If for any reason we should like to have pile on both sides, we may use the same draft as in fig.6 but with a different tie-up (fig.7). Here the first shot of weft from the top will produce a float on the front of the fabric from A to B, and another one on the back from C to D. The second shot: floats from B to C, and from D to E, and so on. The floats will be much shorter than in fig.6. Since the tabby does not overlap we have to use the binder - otherwise the fabric would have vertical slits below A, B, C, D, and E.

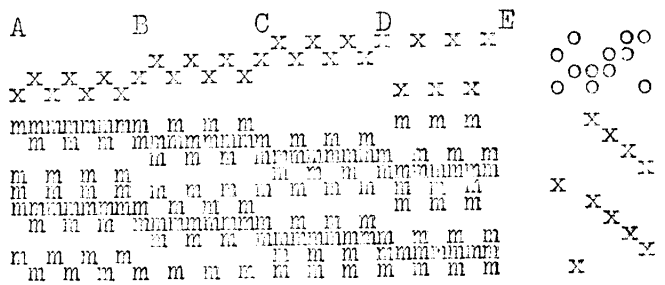

Fig.7

We may notice here that the threading draft as well as the tie-up is practically identical with many overshot drafts. Thus corduroy can be woven on overshot drafts of this type, the only difference being in treadling.

In drafts discussed so far the pile has been more or less uniform. We may change its depth very easily by changing the length of portions A-B, B-C, C-D and D-E in the draft on fig.7. For instance the draft on fig.8 has short pile at first then it gets longer towards the center of the draft and shortens again at the end.

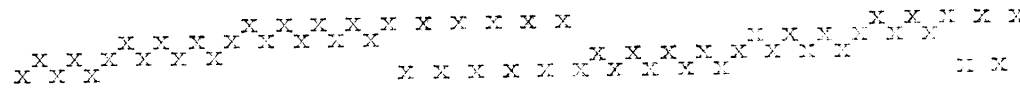

Fig.8

In some cases we may want pile of different depth to cover the ground between the rows of long pile. Here rows of short pile are "planted" in the middle of the empty space. Since the short float is in the center of the long one, both can be cut at the same time (fig.9) without such difficulties as in case of the draft in fig.6. The draft is shown in fig.10. Long floats appear between A and D, and D - G. The short ones: from B to C, and from E to F. The binder must be used quite often otherwise there would be no ground from B to C, and from E to F.

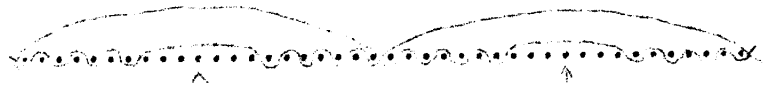

Fig.9

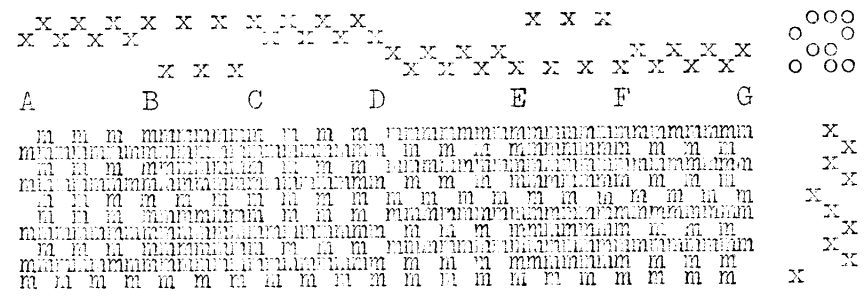

Fig.10

The colour combinations in corduroy present quite a few problems and the whole subject is too involved to include it here. We shall come back to it in one of the next issues of the Master Weaver. We may mention here that it is possible to weave four block patterns in colours on 4 frames.

We have already remarked that it is important to have the pile on the front of the fabric, even if the pile is cut later on. Thus all tie-ups given here should be reversed for weaving on rising shed looms.

If we use counterbalanced looms without shed regulator, we may have some difficulties with the sheds, since most tie-ups are unbalanced. Then the loom should be adjusted so that the pile sheds (e.g. 1 and 2 in fig.10) will open fully - then the binding sheds will be a little narrow, but it matters less, since the binder is used not so often

as the pile weft.

The cutting of pile has been done in old times with a special tool not available at the present. We have to use scissors. They should have long, very narrow blades, and dull but not curved points. It may be difficult to find such a model. Then at least one blade must be straight. Since the point is usually very sharp we can round it a little on a whetstone. This is to prevent the blade from digging into the ground and cutting the binder. Finally the blades should be very sharp to start with, and kept sharp at all times. When cutting, keep the warp under tension, insert the straight blade under the row of floats right in the center and cut, pushing at the same time the scissors forward. With short floats this operation is rather slow.

The last quarter or half of an inch of the fabric next to the edge may remain uncut, and later on turned under and stitched to the back. Thus the pile will reach right to the edge. Consequently the edges, since they are not going to be cut anyhow, may be threaded in plain twill (1234).

The fabric is cut on the loom after 6 inches of weaving or so. After it is taken off the loom it should be spread on a table and brushed vigorously in all directions.

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Let us take as an example of a complete project in corduroy a bedspread 2 by 3 yards. We shall use for warp 10/2 cotton set at 20 ends/". Thus we shall have about 800 ends, and the length of warp will be 7 yds. The bedspread will have a seam in the center but in corduroy it will be practically invisible. The threading draft based on the one in fig.10 is shown in fig.11.

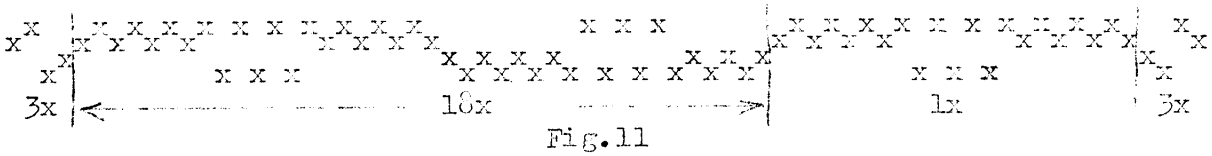

Fig.11

The binder may be 20/2 cotton. The pile - wool 2 or 3 ply, about 1000 yds/lb. All three yarns of the same colour.

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