filled with water until the desired tension is obtained.

Now we open the pile shed, insert the velvet rod, change the shed and see what happens. If the rod is only partly above the sur - face of the fabric - the tension of the ground warp is too low, or the tension of the pile warp too high or both. Adjust both tensions until satisfied. And this is all. From now on follow the rythm of weaving described previously.

The treadling will be: 23231, or 23213231, or 232321323231, or even: 2323231. Try all of them and find the best.

When the finished piece is taken off the loom, it seldom looks satisfactory. In most cases it shows too much ground. The fi - nishing consists first on combing the pile with a brush in all direc- tions, then beating it vigourously with a long and flat piece of wood Try an odd lease rod, a yard stick or something similar.

In the next article on this subject we shall take up patterns in velvet weave.

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PROBLEMS IN TWILLS — Part 1

HIGH TWILLS.

What do we mean by "high"? Let us say, anything woven on more than four frames. Therefore this article is written for "multiharness" weavers. We expect that each weaver of this class is familiar with plain biased twills of any kind. If not he can get all the informa- tion wanted from text books (Reed, Oelsner, Watson).

The following is the most important part of the theory of twills: 1-st, that you can divide one repeat of twill into as many floats as desired, provided that we do not get plain tabby as the re- sult; 2-nd, that there must be the same number of floats on each side of the fabric (e.g. a twill: 2:3:2:1:4 is impossible); 3-rd that the twill is woven on a number of frames equal to the sum of the numbers designating it (e.g. twill 1:1:4:4 is woven on 10 frames because 1+1+ 4+4=10).

For instance a 6 frame twill can be either: 1:5 (over one, under 5), 2:4, 3:3, 1:1:1:3, or 1:1:2:2 (fig.1 A, B, C, D, and E).

It may appear that we forgot something. For instance 1:2:1:2 twill. Yes, but this twill is identical with 1:2 twill, which can be woven on 3 frames. Then we have a different twill in fig.1 F. Yes, but this is only the reverse of 1:1:1:3 twill in fig.1 D.

Thus any original twill must not be a repetition of a 3 or 4 frame twills, for instance: 1:2:1:2, 1:3:1:3, 2:2:2:2, etc. On the other hand it should not be the reverse or a variation of a twill already listed. Thus 1:1:1:3 is the same as 1:1:3:1, and 1:3:1:1, and 3:1:1:1; and 1:1:2:2 is the same as 2:1:1:2 etc.

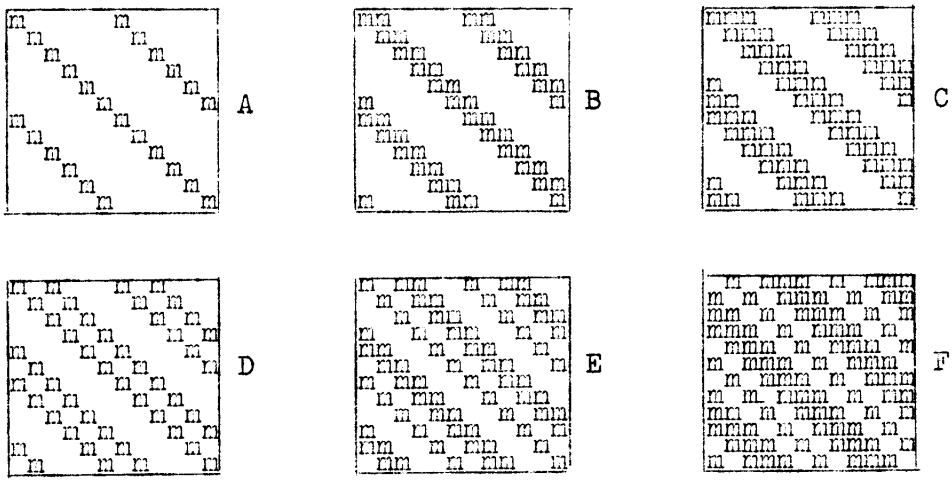


Fig.1

But all this is only an introduction to what we are really interested in: the pattern twills. Multiframe twills of this kind are a distinct class of handweaving. They are always woven in one colour, - and most often in a neutral one. They have the same quality as damask - so discreet that never out of place, and so striking in their craftsmanship that thay never remain unnoticed.

They are very easy to design. We must simply observe the following rules:

1. In threading we change the direction at least once in the center of the pattern, or 3, 5 etc. times at the same distance from the center.

2. The treadling is usually identical with the threading.

3. The tie-up must have one of its diagonals running all the way across, for instance from the left hand lower corner to the right hand upper corner of the draft.

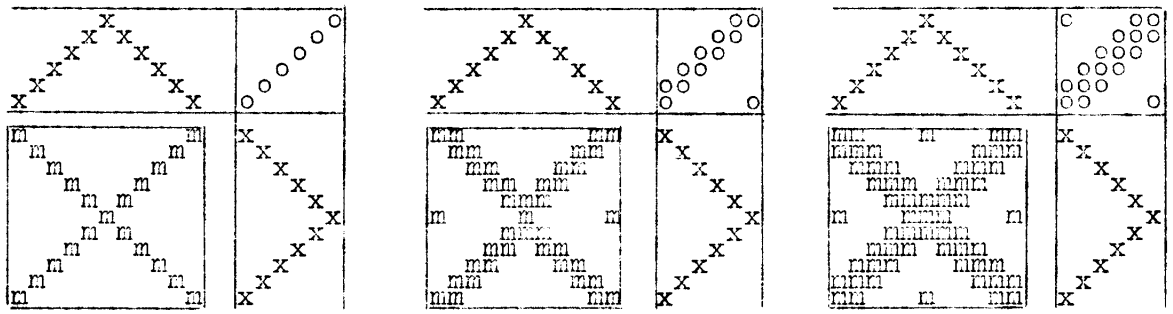
If we disregard these rules, the patterns will not be symmetrical. But why should a pattern be symmetrical? As a rule it does not need to be; the modern tendency is rather to get away from the strict requirements of symmetry.

The answer is that the pattern twills are not modern any more than they are traditional. It is a fact that they look at their best when they are perfectly squared. The delicacy of the design seems to be impaired when we use just any fancy treadling.

Therefore if we agree to weave symmetrical patterns we must know how to do it, and how to recognise symmetrical variations of the original pattern.

From our experience with 4 frame pattern weaves we remember that there is always one basic treadling which gives a straight diagonal across the fabric and at the same time a symmetrical pattern. In case of higher twills this is not true at all. There are twills which have no "woven-as-drawn-in" pattern at all, and there are twills which have two such patterns.

To illustrate this let us go back to our 6-frame twills in fig.1. The first, and third (A and C) give each one symmetrical pattern, as in fig.2 A, and C. The threading really does not matter, and we have selected the simplest.

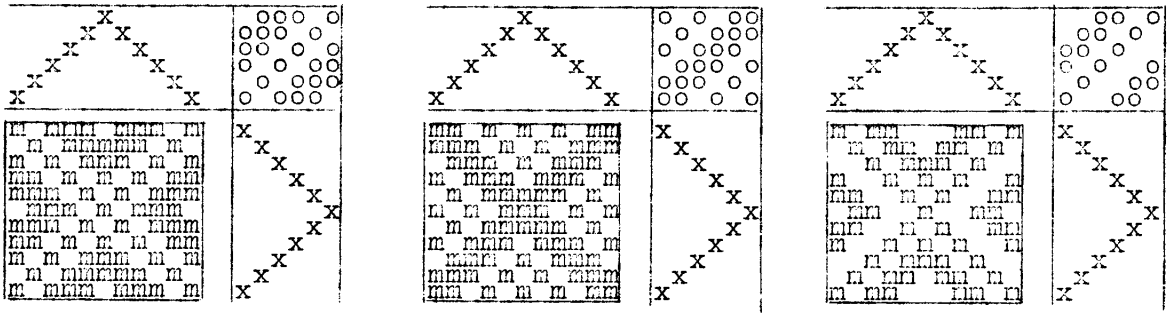


A B C

Fig.2

Fig.2 B is not absolut ly symmetrical but enough so for practical purposes. For that matter all twills which have the main diagonal with floats of 2, 4, 6 etc (all even numbers) behave in the same way.

But when we come to the twill in fig.1 D (or F), there are two ways of weaving it "as-drawn-in": we follow either the fine diagonal (A fig.3), or the heavy one (B fig.3). Finally with the twill in fig.1 E there is no way of squaring it, as long as we follow a diagonal: the pattern is always not symmetrical (fig.3 C).



A B C

Fig.3

So much for the "woven-as-drawn-in" patterns. In conclusion we may say that to get a perfect twill of this kind, we must select one which has a tie-up perfectly symmetrical to one of its diagonals. For instance 2:1:2:3 - the diagonal to be followed must be 1 or 3. But a twill 1:2:1:4 will not do.

In the next article on this subject we shall see what can be done with higher twills woven in "rose fashion", or without diagonals crossing the woven piece.

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