MASTER WEAVER

Z - HANDICRAFTS · FULFORD · QUEBEC · CANADA

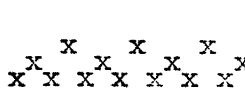
April, 1952 No.3

ANALYSIS OF PATTERNS

The method which we have described in "Analysis of Fabrics" in the last issue is universal. It can be used with any two-dimensional fabric. But in certain cases it is a very long and laborious method. If we take for instance an overshot coverlet with one repeat of 300 ends and as many picks, the very first step will prove to be a Herculean task. Here the draw-down of a single repeat will take nearly a square yard of graph paper, and hours if not days of work.

Fortunately there is no need to perform a detailed analysis of very large patterns. Once the weave is established by analysing a small sample, the pattern can be drawn directly in a short draft.

Thus the first stage in analysis of pattern weaving is to find the weave. This is done in the way described in "Analysis of Fabrics" with the difference that instead of a full repeat only a small part of it is taken. The sample should contain at least two blocks of the pattern, and at least 12 threads in each block - in other words not less than 24 ends and 24 picks. After analysing it and arranging the draft it should be quite easy to see the weave.

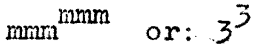


draft

x x - 1-st unit, x x - 2-nd unit.

Fig.1

Even if the weave is an unfamiliar one (Fig.1) we can distinguish the units corresponding to the pattern blocks, and from now on to work with graphical short draft (profile) by replacing each unit with a single square on the graph paper. In this way the draft in Fig.1 becomes a short draft in Fig.2.



or: 3^3

Fig.2.

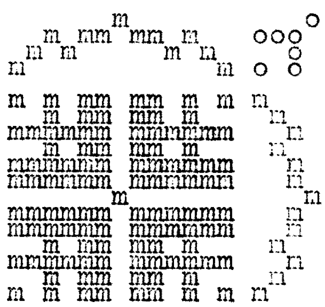
Once the weave and consequently its units are known, we count the number of units in each block of one repeat of the pattern. The counting of units is quite easy in such weaves as crackle, summer-and-winter, lace etc. because each unit produces a distinct float or combination of floats. It is more difficult in damasks, where floats form a more or less uniform surface.

Instead of counting the units we can measure the blocks. For instance a damask based on 1:4 satin has all units of 5. If the sett is 30 to the inch, each unit is 1/6" long. Thus a block which is $1\frac{1}{2}$" long will have 9 units.

In most cases we can tell the weave at a glance without any analysis. Then what remains to be analysed is the pattern. On the other hand we may analyse the pattern without being interested in the

weave. For instance when looking for new ideas in patterns we may take one not from a woven piece but from embroidery, painting, leather work, or just from our own imagination. Then we have to find out first how many blocks the pattern has, so that we can decide in what particular technique we can weave it if at all.

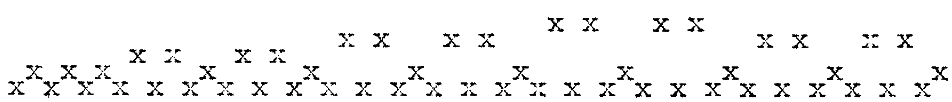
The procedure here is very similar to the one used in fabric analysis. First of all we make a draw-down of the pattern (fig.2). One square on the graph-paper corresponds to one unit of the weave, if a woven piece is being analysed, or to the smallest element of the pattern if this is taken from a different source. Then we get first the graphical short draft of the threading, and from this - the short tie-up draft, and short treadling draft. Here as in fabric analysis we examine the vertical columns in the draw-down, and group the identical ones on the same line of our threading draft: a and m on one line, b,d,j, and l on the second, c,e,f,h,i,k - on the third, and finally g on the fourth. Which gives us four blocks. The tie-up and treadling are found next exactly in the same way as in fabric analysis. Since all these drafts are short they have to be developped into full drafts by replacing each square or "o" with a corresponding unit of weave.



abcdefghijklm

Fig.2

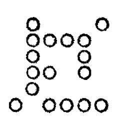
In our example the blocks are used in combinations (1-st and 3-rd pick), and the pattern cannot be woven either in overshot, plain crackle, or plain spot. Supposing that we shall weave it in lace, the draft will be developped as follows:



etc.

border a b c d

The tie-up will become:

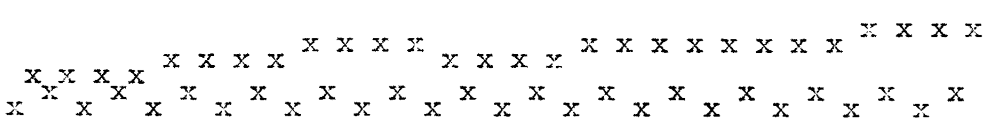


654321

and the treadling:

565656	- border
545456545456	- 1-st + 3-rd block
535356535356	- 3-rd block
525256525256	- 1-st, 2-nd, 3-rd bl.
515156515156	- 4-th block.

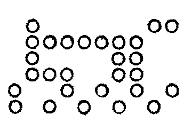
The same pattern developped in Summer-and-Winter will be:



etc.

a b c d e f g

The tie-up:



ab87654321

and the treadling:

8a7b8a7b6a5b6a5b4a3b4a3b
6a5b6a5b4a3b4a3b4a3b4a3b
2a1b2a1b - etc.

Exactly the same technique is applicable to most weaves, with the exception of overshot, crackle, and spot.

Neither overshot nor plain spot have a definite unit of weave. This is the reason why graphical short drafts are not used in connection with these weaves. Since there are no units, each square on the graph paper would have to represent one thread, and the "short" draft would not be any shorter than the full draft. Here we use short

numerical drafts. We shall start with an all-over-spot pattern as an example. Fig.3 shows a draw-down of a part of a pattern without ground, just the floats. We do not make this draw-down actually, it is used here instead of a sample. What we do is to select on the woven piece a place where all blocks of pattern (3 in our case) lie near each other, and then we go all across one repeat noting down their length and relative position. If we work between "a" and "b" on fig.3 the first block to the left is 3 ends long and lies on the lowest line. The second is one of 5 and higher up. The third - one of 7 and still higher, and so on. The numerical short draft of this part of the pattern will look as follows:

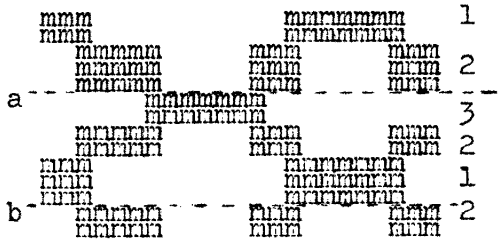


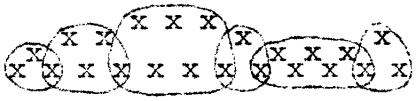
Fig.3

$3\,5\,{}^{7}3_{7}\,3$

The counting of the length of the floats is not very difficult here since all floats skip an odd number of ends.

If we want to get a full threading draft, we assume that the lowest line of the short draft corresponds to the heddle-frames 1 and 2, the second to 1 and 3, and the third to 1 and 4. Thus:

$3\,5\,{}^{7}3_{7}\,3$ =



Since the floats in the fabric overlap each other by one warp end, the corresponding parts of the draft must overlap as well.

The situation in case of overshot is more involved, but the principle is the same. If we analyse four block overshot, we have to select on the sample four rows, each from a different block, and lying close together. It is a good idea to cover with paper everything below and above these four rows, particularly if the pattern is a long one. Then we go across one repeat marking the length of floats and their position. This will give us:

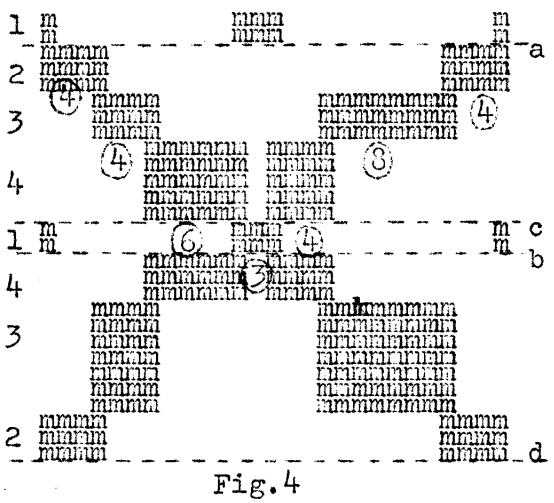
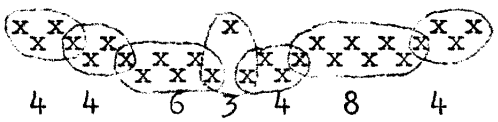


Fig.4

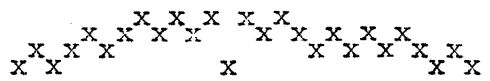
$4\,4\,6_{3}\,4\,8\,4$

If we want a full threading draft, we assume that the highest line in the short draft corresponds to the blocks written on frames 3 and 4, the next - on 2 nad 3, the next - on 1 and 2, and the lowest - on 4 and 1. Since the floats overlap by one as in case of spot-weave, the draft will be:



Here one might object that this draft is valid only when we analyse the part of our sample between "a" and "b", but that we shall get a different draft analysing it between "c" and "d" for instance. This is quite true. In the latter case the short and full drafts will be:

$4\,4\,{}^{6}3_{4}\,8_{4}$ =



but both these drafts give us exactly the same pattern, and it is of no consequence which one we shall use. In all there are 8 different

ways of writing any four block overshot draft in an orthodox manner, and as many as 24 if we use less orthodox arrangements. The same applies of course to any weave with a draft written on four frames.

If we observe carefully the length and position of floats in overshot, we shall soon notice that they follow two simple rules: as long as they lie on one diagonal (going either up or down) they skip an even number of warp ends (blocks 2, 3, 4 in fig.4), but in the "points" where the diagonal changes direction they have an odd number in length (block 1). Thus when taking down the short numerical draft from a sample it is not really necessary to mark the different blocks on different lines - they may be written all in one row, e.g.: 4,4,6,3,4,8,4. However in the first method it is much easier to detect mistakes should there be any. Thus a short draft (fig.5a) has a mistake and it would be quite impossible to develop it, because of the block "7". Should however be the same draft written all in one row: 3,4,6,8,7,9,8,6,4,4 the mistake could not be found out, and the draft would be wrongly interpreted as Fig.5 b.

$3^{4^{6}}_{8^{7^{9}8}_{6}}{}^{4}_{4}$ a Fig.5 $3^{4^{6}}_{8^{7}_{9}8^{6}}{}^{4}_{4}$ b

The best method of developing short overshot drafts is to mark off spaces for blocks on a piece of graph paper, and fill them with marks for heddles later on.

Crackle can be analysed as an overshot, but then even the short numerical draft is quite long:

$$\begin{matrix} 3\ 3\ 2_{3}3_{3}3_{2}3_{3}3_{2}3_{3}3 \\ 3\ 3 \end{matrix} = \begin{matrix} x_{x}x\ x_{x}x\ \blacksquare\ x_{x}x_{x}x_{x}x_{\blacksquare}\ x_{x}x_{x}x_{x}x_{\blacksquare}\ x\ x \\ x\ \ x \end{matrix}$$

or in the same way as Summer-and-Winter with two reservations however: first that a graphical short draft will be only approximate due to the connecting ends (■ in our draft), and second that the blocks as seen on a woven sample are overlapping each other by half of their length, and consequently appear much longer on the sample than on the draft. Fig.6 shows a part of the draw-down of the above draft. The first block as seen extends from a to c, when actually it is written only from a to b. The second block reaches from b to d, but is drawn from b to c. Thus when writing a short draft directly from the sample we should get for these two blocks 2_2 and not 5_5 or 4_4. Then the whole draft will be: 2_{2_2}.

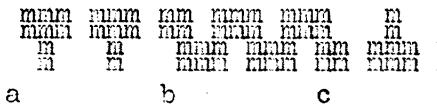


Fig.6

Theoretically the graphical short draft should be then as on fig 7 a, but such a draft would be useless for making the draw-down, and it is much better to write it as in Fig.7 b. In other words one principle should be adopted for numerical short drafts, and another for profiles.

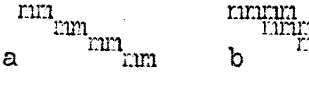


Fig.7

Should this technique of working with units of crackle prove to be rather confusing, it may be better in case of doubt to resort to the technique used for overshot, which is absolutely reliable ever if longer.

****