

DOUBLE WEAVES

MULTI-BLOCK PATTERNS

With a large number of heddle-frames any pattern can be woven in double weaves provided that we have a sufficient number of treadles.

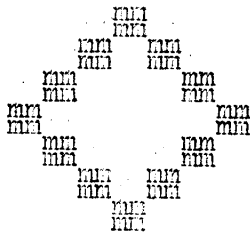


Fig. 1

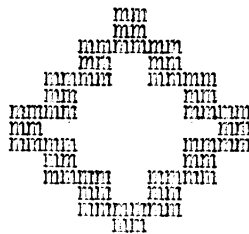


Fig. 2

For instance a four-block pattern in fig. 1 can be woven on 16 frames, and 16 treadles but if the blocks are combined as in fig. 2, the number of treadles becomes too high to be practical (28).

Even a direct tie-up won't help very much, because of the number of treadles which have to be used simultaneously. This is why even comparatively simple patterns in double weaves must be woven either on a loom with a double harness, or with a jacquard or dobby machine to operate the frames.

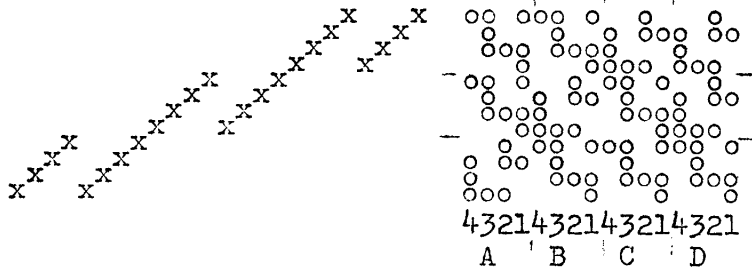


Fig. 3

About the only patterns which can be woven with ordinary equipment are the three-block ones. These will call for 12 frames and 16 treadles, which is practically the highest number which can be operated without machinery. The draft in fig. 3 will give each

block of pattern separately (groups of treadles A, B, C) and one combination of blocks (group D).

The threading drafts as well as the tie-ups for double weaves are really very simple, but they take a lot of space, and time when drawn in full. Consequently we use nearly always short drafts or profiles for threading, and short drafts for the tie-ups. In profiles one square corresponds to one unit of the weave, and in short tie-up drafts one "o" - to a tie-up for a four frame double weave, when the empty spaces are the reversed tie-up. Thus the full draft in fig. 3 will have as its corresponding short draft the one in fig. 4.

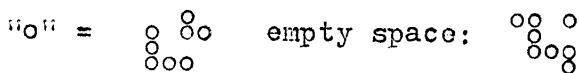
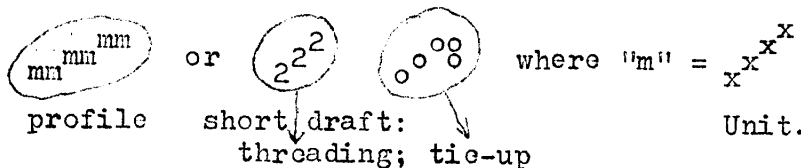


Fig. 4.

The tie-up on fig.3 does not look very clear. This is because the heddle-frames are rearranged for easier threading. If we change the draft so that the frames which weave one layer of the fabric will be kept together, the tie-up becomes much easier to understand. To make the draft still clearer we marked in fig.5 the two colours in the warp: one with "x", the other with "m". One position of the layers ("x" on top) has then the usual tie-up (fig.5 A), and the other its reverse (fig.5 B).

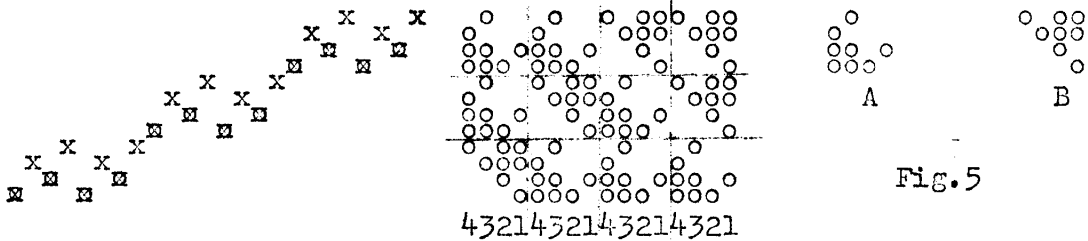


Fig.5

The treadling in the first case (fig.3) would be 4321 for each block of the pattern - one colour on 4 and 2, and another on 3 and 1. In the second case (fig.5) it is 4231, which is more convenient because the feet are used alternately. Here one colour of weft is used on treadles 1 and 2, and the other on 3 and 4.

Any project for patterns in double weave must start with the profile. This is made from the drawdown of the pattern as in fig.6.

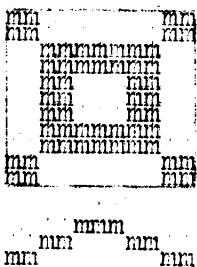


Fig.6

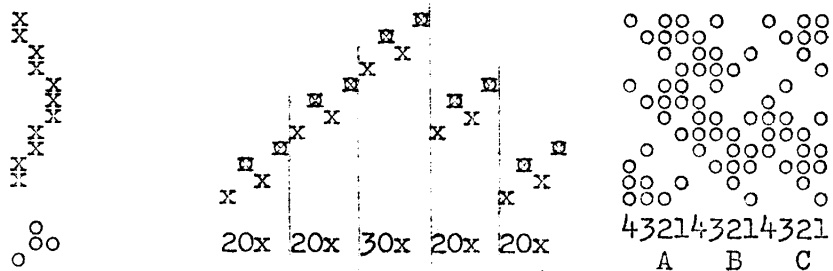


Fig.7

At the same time we get short treadling draft, and short tie-up draft (compare "Analysis of Patterns" MW 3), which is absolutely necessary to develop later into the full tie-up draft.

The next step is to figure out the warp, which will give us the number of ends per one square of the profile. Our profile has 11 squares, and each square has to have an even number of repeats of four. If our warp will have 440 ends, each square will have 10 repeats or 40 ends.

The full threading draft may be drawn either as in fig.3, or as in fig.5. In the second case each "m" of the profile is replaced

with 10 repeats of: $\begin{matrix} x & x \\ m & \square \end{matrix}$ which gives us the draft on fig.7.

The treadling will be: 20 times A (4231), 20 times B (4231), 30 times C (4231), 20 times B (4231), and 20 times A (4231). In all blocks the treadles 4 and 3 will carry one colour, and the treadles 2 and 1, another colour.

Before threading the draft may be rearranged, so that the

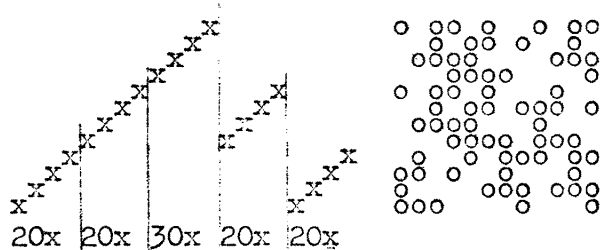


Fig.8

heddles will be threaded in a continuous way (fig.8). One must be very careful with the new tie-up. When any frame in the threading draft is moved to a new position, all the ties lying in line with the frame must be moved as well. The treadling with the new tie-up remains the same as before.

So far we discussed only double weave woven in tabby. In theory both layers can be woven in any weave: twill, satin, or pattern weave. In practice only the simplest twills are satisfactory, because of the number of frames they require.

The simplest twill 1:2 or 2:1 requires 12 frames for two block patterns. Here we have a choice of weaving both sides in 1:2 twill (tie-up A, fig.9), or both sides in 2:1 twill (tie-up B), or one side in 1:2 and the other in 2:1 twill (tie-up C).

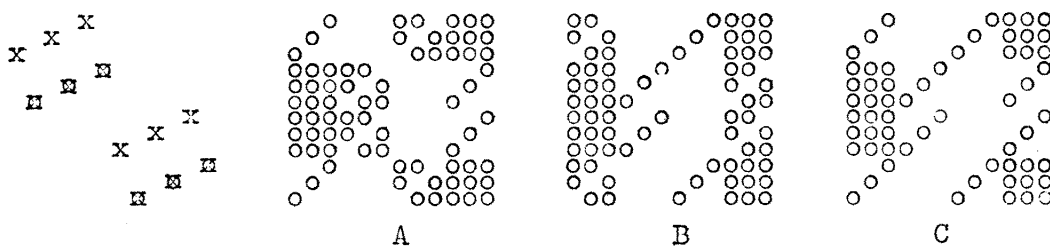


Fig.9

Each of the above tie-ups is composed of 4 "units" of ties. Unit "a" in fig.10 gives two layers of one block, both in 1:2 twill.

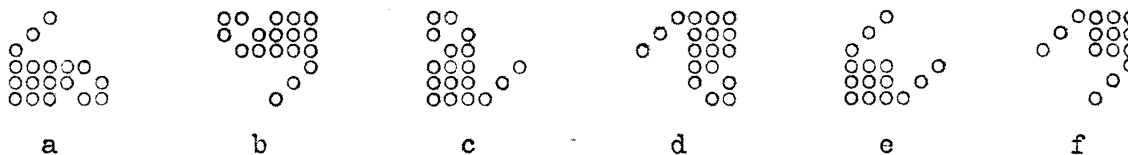


Fig.10

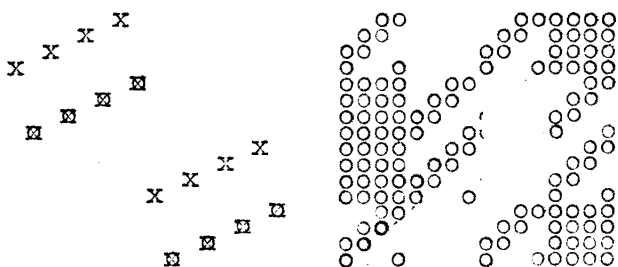


Fig.11

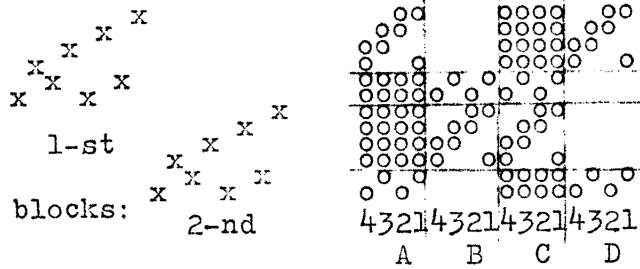
"b" is weaving the second block in the same way. Unit "c" produces 2:1 twill for one block, and "d" for the other. Finally unit "e" weaves one layer in 2:1 and the other in 1:2 twill, when "f" is its companion for the other block.

All these units can be combined in one tie-up and even more variety can be achieved. For instance on the same side of the fabric one block can be woven in 1:2 and the other in 2:1 twill. Then the direction of

the diagonal can be changed as well, thus producing the effect of a turned twill, and of the double weave at the same time.

We shall have still more possibilities with a 1:3, 2:2, or 3:1 twill. Individual blocks can be woven in any of them, as biased or broken twill. Fig.11 shows an example of 2:2 twill with all diagonals going in the same direction.

Still another class of pattern double weaving has one block woven in an entirely different weave than the other. For instance one block in twill, the other in tabby, when underneath the order is reversed.

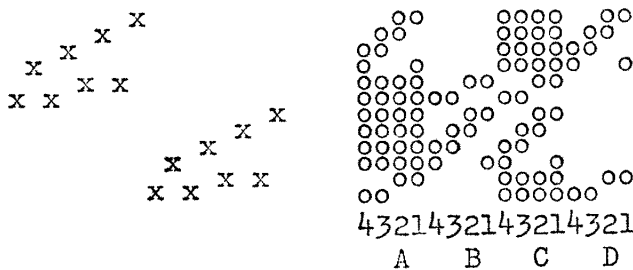


In fig.12 heddle-frames 1, 2, 7, and 8 are threaded for tabby, the remaining ones for twill. Groups of treadles A and B (used alternately) give in the first block: twill in the upper layer and tabby in the lower layer, when the second block has tabby on top, and twill underneath.

Fig.12

Groups C and D give just the opposite: tabby on top in the first, and twill on top in the second block.

Basket and twill are very similar in drafting to tabby and twill



With identical treadling we shall get in fig.13 basket where we had tabby in fig.12. On the other hand if we change the treadling let us say for one giving broken twill, we will not get either tabby in fig.12 or basket in fig.13.

Fig.13

and 1:2 or 2:1 twill cannot be woven on less than 24 treadles (only 10 frames) unless two treadles are used at the same time, as in fig. 14.

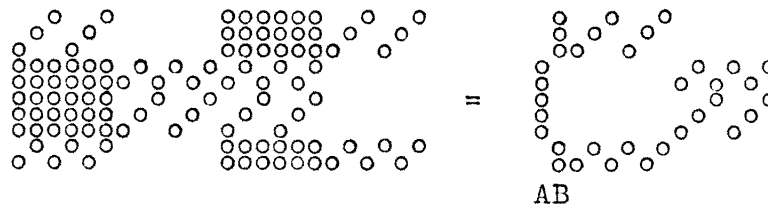


Fig.14

Pressing at the same time treadle A or B and one of the other treadles we can get all combinations of ties necessary.
