

TWO - HARNES S M E T H O D - 2.

T U R N E D T W I L L S .

Of many weaves which can be woven advantageously on a two-harness loom the turned twills are the most typical. For that matter many looms of this type are built exclusively for weaving the "D" class (Dimity, Dornick, Diaper, Damask). Perhaps before we go further we shall give definitions of all these terms. Except for damask they are all obsolete, but they have no corresponding terms in our modern language, and consequently we do not hesitate to bring them back to life in their proper meaning.

Dimity (not Dimity cord) is turned 1:2 twill, i.e. twill in which one part of the fabric is woven as 1:2 (weft passes over one and under two warp ends), and the other as 2:1 twill. In plain weaving 2-block pattern can be made on 6 frames, 3 on 9, 4 on 12 and so on. It has always a diagonal.

Dornick (but not Dornick twill) is a similar weave based on 1:3 and 3:1 twill. In plain weaving 4 frames are required for each block of pattern. It can be biased or broken. When it is broken it may be sometimes called rough damask or just damask, but this extension of the meaning of the word "damask" is rather confusing and should be avoided. The proper term for such an imitation of damask is "damassé", another obsolete word.

Diaper (again has two meanings). Any turned twill as long as it is not damask proper. Thus both dimity and dornick are diapers, but besides those any twill of higher order (1:4, 1:5, 1:6 etc) if turned but not broken into a satin will belong here.

Damask is a turned satin. Since satin is a broken twill of the type 1:N where N is more than 3, and where the breaking of the diagonal is done according to certain rules, not every twill 1:4, 1:6 etc even if broken is necessarily damask. However in practice such twills are seldom woven and it is either biased twill (which gives diaper) or satin which gives damask. In plain weaving the simplest damask can be woven on 10 frames - 5 frames per block of pattern.

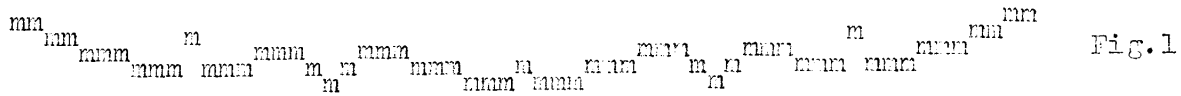
We should like to emphasize that all these terms belong to the 18-th century hand weaving, and that no better or simpler terms have been used in hand weaving since.

To compare the number of frames needed for the above weaves both with single and two-harness looms we give the table below:

<u>weave:</u>	<u>blocks:</u>	<u>single harness:</u>				<u>two-harness loom:</u>			
DIMITY	2	6	frames	6	treadles	5	frames	3	treadles
"	4	12	"	12	"	7	"	3	"
"	8	24	"	24	"	11	"	3	"
DORNICK	2	8	"	8	"	6	"	4	"
"	4	16	"	16	"	8	"	4	"
"	8	32	"	32	"	12	"	4	"
DAMASK 1:7	2	16	"	16	"	10	"	8	"
"	4	32	"	32	"	12	"	8	"
"	8	64	"	64	"	16	"	8	"

It is obvious from the above that hardly any pattern with more than two blocks can be woven on a single harness. It is not even the number of frames which gets too high, but the number of treadles. With two-harness method we can go easily into higher damasks with a reasonable number of frames and a very low number of treadles, which is still more important.

There is another point here worth consideration. When we speak about the total number of frames used in two-harness method, some of them are pattern frames. This means that not only they are not operated by treadles, which makes weaving so much simpler, but also that they contain very few heddles. For instance if we have a profile for 5 block damask like the one in fig.1, where each "m" is equal to 2 units of



damask (10 ends), we need for the whole draft (590 ends) only 59 heddles on all 5 pattern frames, an average of 12 heddles per frame. The position of these pattern frames will be changed only 27 times during the weaving of one square, compared with nearly 600 movements of the ground harness. Thus the pattern harness really does not matter very much in weaving of turned twills. Once we have a loom with 10 pattern frames, it is as easy or difficult to weave a two-block, as a 10-block pattern.

The real problem in drafting for two-harness method is the tie-up. In all turned twills woven on single harness looms we design

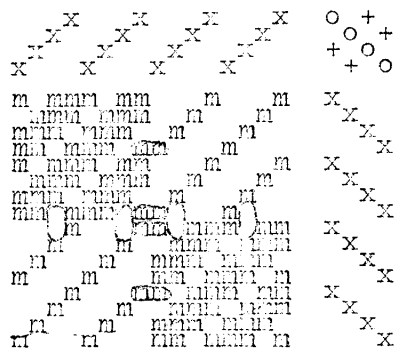


Fig. 2

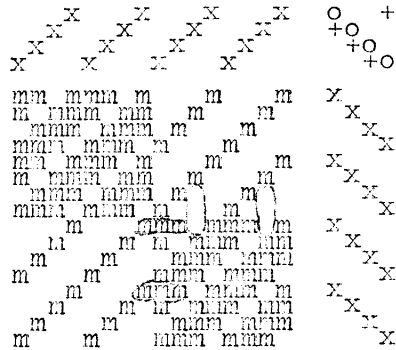


Fig. 3

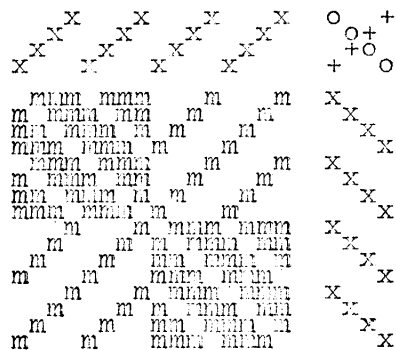


Fig. 4

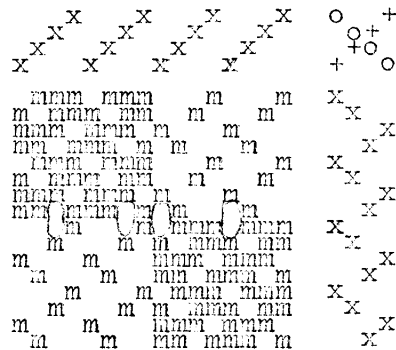


Fig. 5

the tie-up so that the blocks of pattern are clearly "cut" from one another, i.e. that no floats either in warp or in weft cross the border line between two blocks (comp. "The Logic of Tie-Ups" in MW 3, 1952). But what happens in the two-harness method? Let's look on the floats

in the draw-down on fig.2. There are 4 floats in weft and 4 in warp crossing the line between blocks. With a different tie-up (fig.3) the blocks will be cut on two sides and "uncut" on the two remaining ones. Finally with the tie-up in fig.4 we have all blocks cut properly. We may notice at the same time that the diagonal in fig.2 and 3 runs in the same direction in both blocks of the pattern, when in fig. 4 twill 3:1 has a left hand, and twill 1:3 - a right hand diagonal.

When instead of a biased twill we have a broken one, the situation remains the same, i.e. the same tie-up will serve in both cases. However the treadling must be 1,3,2,4 or 4,3,2,1 but not 1,2,4,3 or 2,1,3,4. In other words the first and the last treadle in the repeat of a biased twill must remain the same when changing from biased to broken twill. Fig.5 shows what happens when we do not follow this rule. Here the blocks are cut in the vertical direction but not so in the horizontal. There are 4 floats in warp which cross the line.

In figures 2,3,4. and 5 we have omitted completely the pattern harness since in all four it is always in the same position.

Thus we have found two principles which seem to guarantee the success in cutting the blocks: 1-st the diagonals in two adjoining blocks must run in opposite directions; 2-nd each repeat of broken treadling must start and end with the same treadle as in the biased treadling. We shall see later how to apply these principles to other twills than Gornick.

WEAVING TERMINOLOGY.

Counter-marche. (fr.Fr."contre-marche") It is hard to say whether the confusion started already in French or only later on in English. Originally "marche" meant the same as treadle (thus "Marchure" means treadling), and a counter-marche was the same as a lamm. Now in double-tie-up looms we distinguish between the short lamms, and long ones, calling the latter - counter-marches. There is logic in that "counter" because the long lamms move in the opposite direction to the short ones, but "marche" is positively wrong. Why not call it "counter lamm", or just long lamm?

The double-tie-up loom is called accordingly "counter-marche loom", which really means a loom with lamms (any lamms). "Double-tie-up" itself sounds artificial, but "Swedish" which is supposed to mean the same, really does not mean anything at all. All kinds of looms are and always were used in Sweden.

Sinking and Rising Sheds. The terminology itself here is flawless. But its application not so. For instance the jack-type looms are obviously of the "rising shed" type. It means that the whole warp remains "sunk", and the sheds open by rising a part of the warp. The same applies to the table looms. But it is wrong to say that a counter-balanced loom works on the principle of "sinking shed". The shed opens in two directions. Each treadle no matter how tied will pull down one part of the warp and rise another. If necessary it can even leave some of the warp ends in the neutral position, as for instance in two-harness method (MW 13).
