MASTER WEAVER

**BI-MONTHLY BULLETIN
FOR HANDWEAVERS**

★

Z-HANDICRAFTS
FULFORD, QUE., CANADA

September, 1956   No.29

POLYCHROME
DOUBLE WEAVES.

"Polychrome" is one of the catch-words from which we are suffering during the last decade or so. It simply means, when applied to weaving, that we are using several colours. All tartans are "polychrome", and so are striped fabrics with all colours in weft - the lowest although beautiful form of pattern weaving. Another term which means the same thing is "multicolour". You can try also "polycolor", and "multichrome". It is fortunate that we are slightly acquainted with Latin and Greek only. If we knew other languages, the number of terms to designate the same phenomenon would be astronomical.

It all boils down to the fact that we are trying to get many colour combinations with comparatively limited means. If our "means" are limited to two harness-frames, then we can have three basic colours in warp and the same number in weft. By crossing them as in plaids or tartans we can also get the intermediary shades. In all: blue, violet, red, orange, yellow, green, and also their mixtures with black and white. But with this method of blending colours we cannot get more than one pure colour in each vertical or horizontal line.
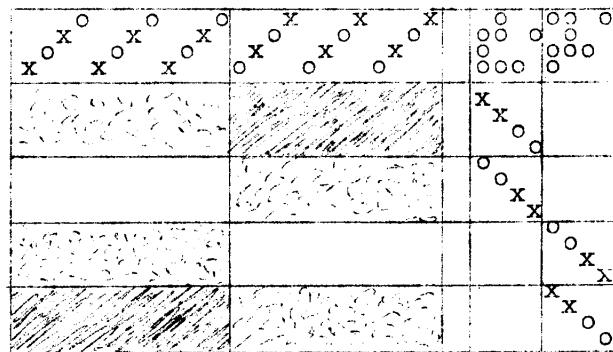

Fig.1

o - white,
x - black.

With four frames we can do a little better. In double weave for instance we can have two pure colours in one line, but only in one direction. This requires special tie-up, which will bring either one or the the other layer of cloth to the surface, as in fig.1.

With only two colours in warp and weft we have three
combinations - two pure colours and one blended. In our example
it is white, black, and grey. Thus we can have a square of black
directly under a square of white (impossible with any other
weave on 4 frames), but not beside a square of white. This rather
limits possibilities of designing patterns.

When we have 8 frames, the situation is completely dif-
ferent. Not only can we have two pure colours in both: vertical
and horizontal direction, but we have also "blocks" of pattern,
exactly as in Summer-&-Winter or other pattern weaves. These
blocks are not the same as the usual blocks of double weaves.
The latter require four frames for each block, and are indepen-
dent from the combination of colours used, when our "polychrome"
blocks grow more numerous with increased number of colours.

Even with two colours: white and black, we can have four
independent blocks of pattern and four combinations of blocks.
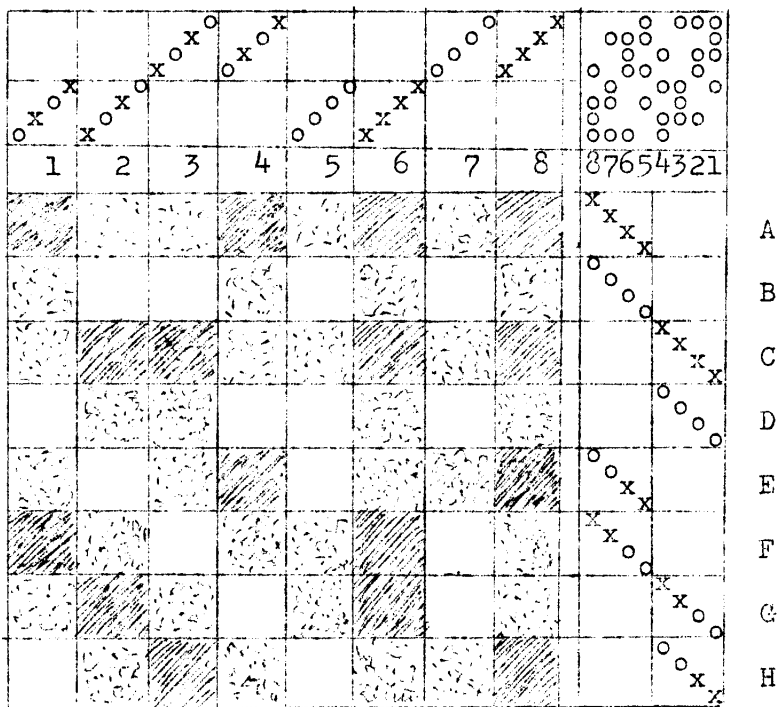Fig.2 shows all the eight combinations.

Fig.2

The eight blocks of threading (1,2,3 etc) can be of
any size and they can be taken in any order. The same applies to
the units of treadling (A,B,C,D, etc).

The table in fig.2 is the key to designing in polychrome
double weave. Without this key all attempts to figure out a
design will be purely a hit-and-miss affair. This is because
with each additional colour the number of combinations increases.
For instance 3 colours give 16 "blocks"; 4 colours - 32 blocks,
and so on. There are simply too many possibilities for trial
and error method.

We shall try now to design simple patterns in white and black, plus of course the incidental grey. The pattern itself must be in a pure colour, either black or white; patterns in grey would be hardly visible, because then the white and black blocks would become "incidental".
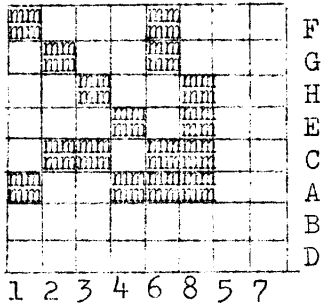

Fig.3

If we decide on black as our leading colour, then we shall regard white and grey as "background". Now we shall arrange the black blocks in some sort of a "profile", or rather a short draw-down (fig.3). We have now a choice of 1,2,3, 4,6,8, and F,G,H,E,C,A for the pattern, and 5,7,B, and D for the ground.

Figures 4,5,6,7,8, and 9 show, what can be done with the draw-down on fig.3. By selecting, enlarging, and rearranging the blocks of pattern we can get quite a large variety of both traditional (fig.4 and 7), and "modern" designs.
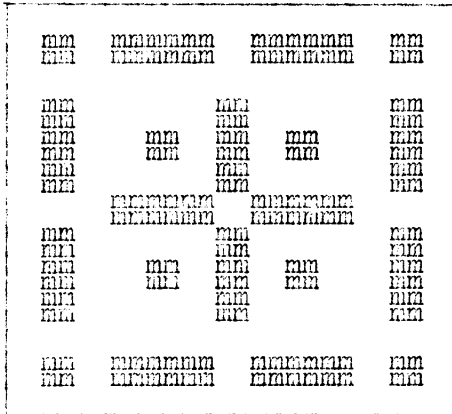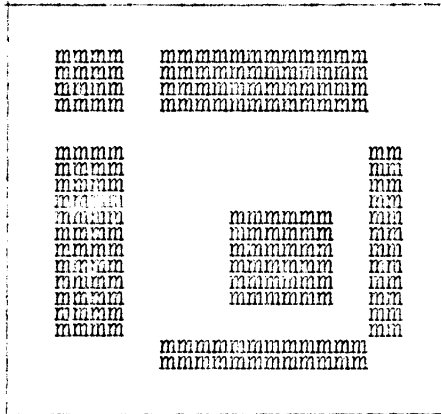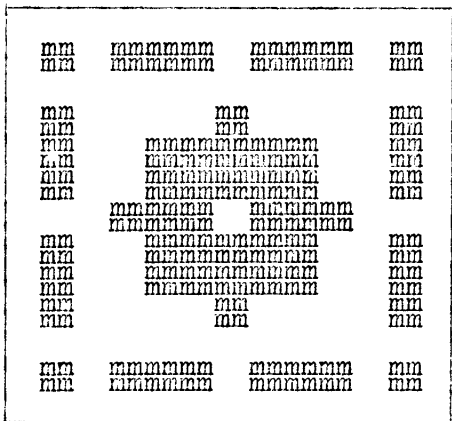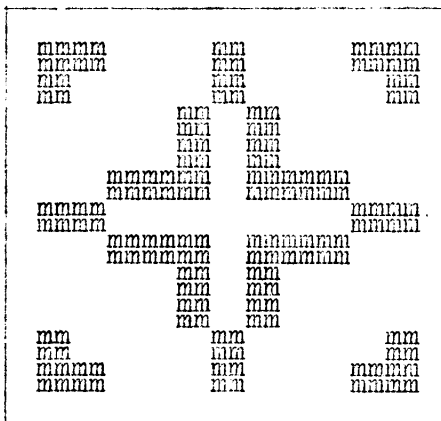

Fig.4

Fig.5

Fig.6

Fig.7

In fig.4 the threading was: 76538313G3567, and the treadling: BCDFAFHFAFDCB.

-

In fig.5, threading: 766533888317; treadling: BCCDFFAAAFHB.
In fig.6, threading: 5673881883765; treadling: BCDFAAHAAFDCB.
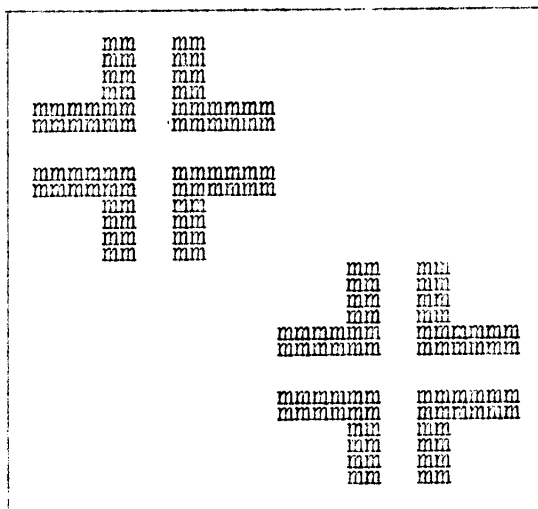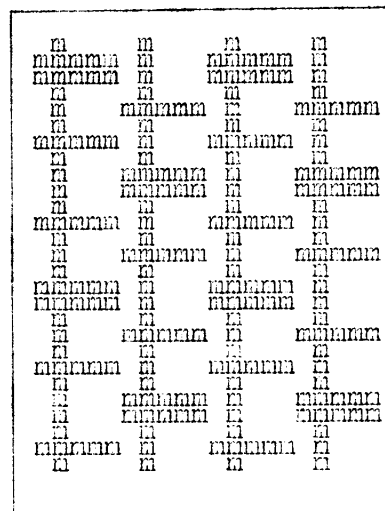
Fig.8   Fig.9

In fig.8 the threading is: 7332523344171445, and the treadling: DGGCBCGGFFADAFFB. Fig.9 is really an "all-over-pattern" with threading draft: 7181112822218111282227, and the treadling: BHAAHCHAHCCHAHCHAAHCHAHCCHAHB.

If we give so many examples of symmetrical or partly symmetrical patterns it is because they are much more difficult to design from a given profile than the so called "modern" or free pattern. Any corner of one of the symmetrical patterns can be cut off, enlarged, and deformed if necessary, to produce a new pattern. For instance fig.5 is nothing else but the left hand upper corner of fig.4 with the blocks changed slightly in length. In the same way fig.8 has been taken from fig.7 with the extensions of the central cross cut off (this removed the corners as well), and then repeated in another combination of blocks.

Speaking about blocks, we may remind the reader that the definition of a block in pattern analysis is: a vertical element of a pattern. Thus in fig.4 we have 5 blocks, and the same number in figs.: 5 and 6. There are six blocks in fig.7 and in fig.8 (two blocks of the ground), and only four in fig.9. The total number of blocks is sometimes 8 (but not more); this in plain double-weave would require 32 frames, and at least 32 treadles. And this is the real advantage of the polychrome double weave - not that it is "polychrome" but that it gives more possibilities in designing than any other 8-frame weave.

The difference in texture between traditional double weave and polychrome is that the change of colour does not coincide necessarily with the change of the two layers of the weave. Thus a black square in traditional double weave is "stitched" on all four sides. In polychrome it may be stitched or not. In other words the pattern follows the structure of the fabric in traditional double weave, but not in polychrome.

Sample No.9 - 5768 - XRXR;   Sample No.10 - 1324 - XRXR;

"	No.11	"	RXRX;	"	No.12	"	RXRX;
"	No.13	"	YXYX;	"	No.14	"	YXYX;
"	No.15	"	XYXY;	"	No.16	"	XYXY;
"	No.17	"	XBXB;	"	No.18	"	XBXB;
"	No.19	"	BXBX;	"	No.20	"	BXBX;
"	No.21	"	RBRB;	"	No.22	"	RBRB;
"	No.23	"	BRBR;	"	No.24	"	BRBR;
"	No.25	"	BYBY;	"	No.26	"	BYBY;
"	No.27	"	YBYB;	"	No.28	"	YBYB;
"	No.29	"	RYRY;	"	No.30	"	RYRY;
"	No.31	"	YRYR;	"	No.32	"	YRYR;

The darkest colours in our project are: black and blue, and the pattern should be designed in those two. The remaining colours will be more or less incidental. As an example we can use the following treadling: No.8 - ¼"; No.7 - ¼"; -repeat these two blocks 5 times; No.14 - 1"; No.15 - 1½"; No.1 - 1"; No.15 - 1½"; No.14 - 1"; No.7 - 1", No.1 - 1½"; No.13 - 1"; No.1 - 1½"; No.7 - 1"; 8 - ¼" and 7 - ¼" five times.

This should give about the right length for a place-mat. It will have a definite pattern (a square and a cross) on one side, when the other side will be more accidental. Both can be used, of course.

* * * * * * * * * *

We may say as well here that the polychrome double weave is about the most difficult one in drafting. The confusion of the two layers of which the lower one becomes the upper and vice versa, the two colours in each layer and/or in each block of pattern; the two kinds of "blocks": one in colours, and another in the structure, makes any "short drafting" very uncertain. A table such as in fig.2 should be worked out for each particular tie-up from <u>Full draw-downs in colour</u>.

In our discussion we have used the standard tie-up for 8 treadles. With 12 or still better 16 treadles we have still more possibilities of combining blocks, but 8-frame looms have seldom more than 10 treadles, and we did not think it wise to include the more complicated tie-ups in this article.

* * * * * * * * * *

SWEDISH LACE.

BRONSON VERSUS SWEDISH LACE

It is about time to clear up the mystery of Swedish Lace as compared with Bronson Lace. Are they the same or are they not? Which is better?

As far as the lace part is concerned, they are absolutely the same. I.e. if we cut out a sample of one block of lace and analise it, we shall get the same result with both. But the drafting is different. Fig.1 shows a draft for the lace in Bronson, and fig.2 a draft for Swedish lace. Both for one block only.

```
x x  x x   o o           x     x    o
x x x x x x x  oo° Fig.1   x x x  x x x  o o° Fig.2
                           x x x  x x x   oo
```

But when we have two blocks of lace plus tabby, the fabrics are no more identical. We have a draft for two-block Bronson in fig.3, and a similar draft for Swedish Lace in fig.4.

Fig.3
BRONSON

- First block of lace

- Second block of lace

- both blocks combined

Fig.4
SWEDISH

- First block of lace

- second block of lace

- both blocks combined

Comparing the two drafts we can deduce that: 1) the tie-up for the Swedish lace is better balanced than the tie-up for Bronson; we have 2 against 3 instead of 1 against 3, and the tabby is 2 against 2. 2) the combined blocks in Swedish do not lie in the same line, when in Bronson they are perfectly aligned. Thus so far Swedish is superior in one way, and Bronson in another.

For the weavers who have counterbalanced looms without a shed regulator Swedish Lace is practically the only lace which can be woven in comfort, and which gives two blocks of pattern. The two blocks combined look bad on the draw-down, but not so bad on a woven piece. For the owners of Jack-type looms Bronson is much better, because of the alignement of blocks.

However when we weave "turned lace", with floats on the same side of the fabric running in two different directions: vertical in one block, and horizontal in the other, then we must change the tie-ups, and the result is different again.
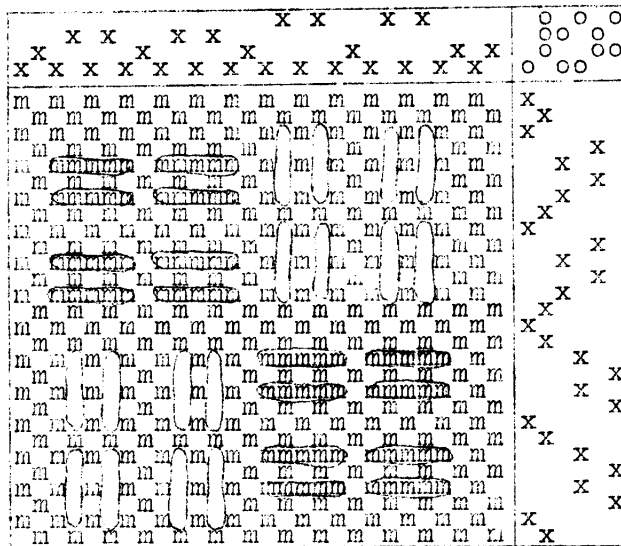
Fig.5 Bronson turned lace.

The vertical floats are not in line with the horizontal ones.

Unbalanced tie-up.

The distance between blocks of lace not the same in the two directions.
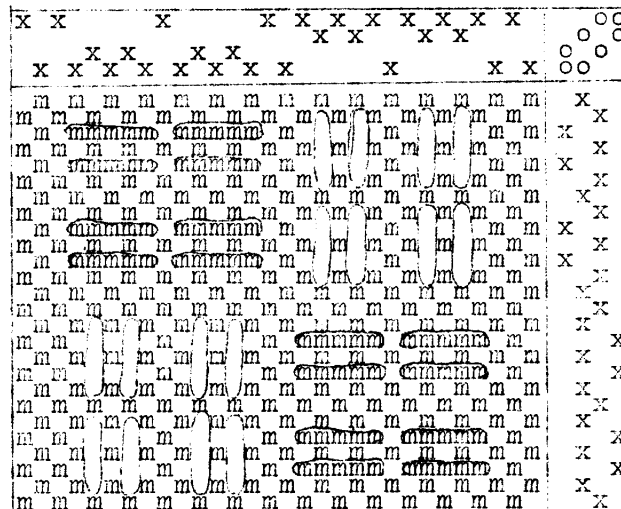
Fig.6 Swedish turned lace.

Floats in warp are in line with floats in weft.

The tie-up is perfectly balanced.

The distance between floats is the same in both directions.

Compare fig.5 (Bronson lace) and fig.6 (Swedish lace).

Here the superiority of the Swedish Lace is obvious. The two sets of floats are exactly in line, when in Bronson they are not any more. The tie-up is perfectly balanced, so that the lace can be woven on a counterbalanced loom as easily as Huckaback Lace, and without a shed regulator.

Thus in final analysis Swedish lace seems to be superior to Bronson on 4 counts and inferior on one. In plain lace it has a better tie-up, but poorer block alignement. In turned lace it has much better tie-up, better alignment of floats, and better spacing of blocks of lace.

On the other hand the drafting of Swedish lace is slightly more difficult particularly with a higher number of frames, as we shall see later.

Since we did already describe the turned Bronson Lace (MW 13/5), we must do now the same for the Turned Swedish.

***** *

Turned Swedish Lace has quite a lot in common with Huckaback Lace (MW 9/8), and probably it is a derivate of huck. The tie-up is the same, and both the threading and the treadling are very similar. Strangely enough the structure of the fabric is completely different. When in both Bronson and Swedish lace the openings in the lace have four small holes grouped in a square, in Huckaback lace we have a single large hole. When in Huck Lace a unit of lace is: 1212143434, in Swedish Lace we have two units (one for each block): 121214, and 434341. Each of these units must be taken at least twice to produce the lace, exactly as in Bronson.

But unlike either Huck Lace or Bronson, the Swedish Lace has also "incidental heddles". We can not join directly blocks 1 and 2, because block 1 ends with a heddle on frame 4 and block 2 starts also with 4. Therefore whenever these two blocks meet we must insert an incidental heddle. When block 2 comes after one the incidental is on frame 1, and whenever block 1 comes after 2 - the incidental is on 4.

A profile for Swedish Lace will have three lines (fig.7). The first (lowest) is for tabby (141414); the second - for the 1-st block of lace (121214); the third - for the 2-nd block of lace (434341). The incidentals do not show on the profile.

```
                              mm                        mmmmmmmmm
                   mm     mm      mm              mmmmmmmmm           mmmmmmmmm                        3
        mmmmmmmm       mm     mm     mmmmmmmm                                mmmmmmmm  mmmmmm   1  2
```

```
                      x x x                     x              x   x x
        units:  1 =                  2 =    x x x x     3 =      x   x
                      x x x               x x x x                    x      ;
```
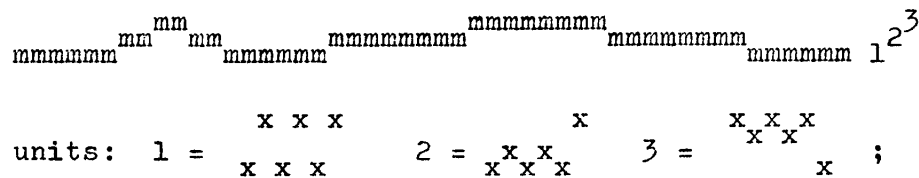
Fig.7

The units of threading can be combined in any way we like, provided that 1-st: we do not forget about incidentals, and 2-nd: that each unit is taken at least twice. However one "m" of the profile may represent more than one unit.

If we develop the profile in fig.7 into a full threading draft we shall have the draft on fig.8. The incidentals are marked with "⊠".
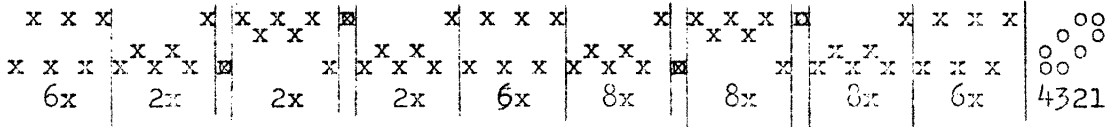
Fig.8

In treadling we have also three units: tabby - 232323, first block: 242423, second block: 313132. Therefore we must have also incidentals in treadling, because block 1 ends on treadle 3, and block 2 starts with treadle 3; and then block 2 ends with treadle 2, and block 1 starts with the same treadle. It means simply that we must insert one shot of the proper tabby between the two blocks.

The whole treadling for the draft on fig.8 will be: 232323 - 6 times, 242423 - twice, one incidental on 2, 313132 - twice, incidental on 3 once, 242423 - twice, 232323 - 6 times, 242423 - 8 times, 2 - once, 313132 - 8 times, 3 - once, 242423 - 8 times, 232323 - 6 times. This will square the pattern.

In the turned lace there are only two symmetrical variations of pattern. We must remember that the two blocks are woven at the same time: one with vertical, the other with horizontal floats. Therefore we shall have two nearly identical patterns shown in figs.9 and 10 in a reduced scale. In the second variation we replace in treadling the first unit by the second and vice versa. As the figures show this is hardly worth while doing.
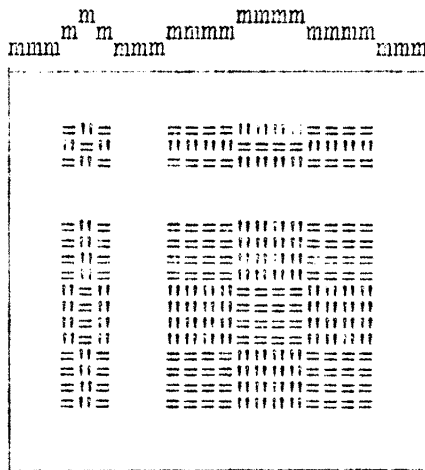
Fig.9
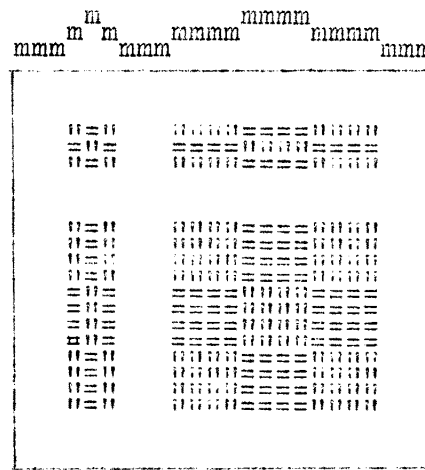
Fig.10

The draft in fig.8 can be used for a Practical Project. Warp: 20/2 linen, 20 ends per inch. Reed No.10, two ends per dent. 286 ends. Weft - the same as warp, and in the same colour.

* * * * * * * * * * * *

ANALYSIS 2

Once we have the draw-down the rest of the analysis is
purely mechanical. The first step is to find the threading. To do
this we compare the warp ends in the draw-down. We start at the
left, and make a cross above the first warp end (fig.1).

```
                                         x           x x
                                    x         x   x      x x
x          x x        x x       x x  x    x x  x    x x
          
mmm m m    mmm m m    mmm m m    mmm m m    mmm m m    mmm m m
m mm m     m mm m     m mm m     m mm m     m mm m     m mm m
mmm m m    mmm m m    mmm m m    mmm m m    mmm m m    mmm m m
 m mmm      m mmm      m mmm      m mmm      m mmm      m mmm
m mm mm    m mm mm    m mm mm    m mm mm    m mm mm    m mm mm
 m mmm      m mmm      m mmm      m mmm      m mmm      m mmm
mmm m m    mmm m m    mmm m m    mmm m m    mmm m m    mmm m m
  Fig.1       Fig.2      Fig.3      Fig.4      Fig.5      Fig.6
```
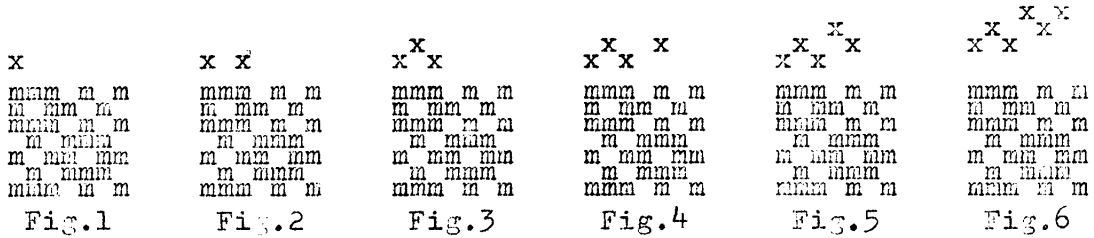
Then we look closely at the way the warp interlaces with
the weft, and try to find other warp ends which are woven in the
same way. The first end goes under three picks of weft, over one,
under one, and over one (the warp is white). We find that the
third end from the left is exactly the same as the first. There-
fore we place the mark for threading corresponding to the third
end on the same line as the first cross (fig.2). No other end is
woven in the same way, so we go back to the second warp end and
make a cross on the second line above the draw-down (fig.3).
Now we examine the warp ends to the right to find out whether there
is another end which goes under one, over one, under two, over one
(a shorter way is to say: black, white, two black, white, black,
white). Yes, there is. It is the fifth and we mark it accordingly
(fig.4). Any more like the second? No, no more. Then we go to the
fourth end from the left, and make a cross on the third line above
the draw-down (fig.5). We look again to the right for another
identical vertical line (or warp end) and find that the sixth is
the same as the fourth (white, black, white, three black, white).
Therefore we place the cross on the same (third) line, as in fig.6.

```
      x x             x x             x x             x x             x x
   x x   x         x x   x         x x   x         x x   x         x x   x
 x x             x x             x x             x x             x x
            
mmm m m         mmm m m  x      mmm m m  x      mmm m m  x      mmm m m  x
m mm m          m mm m          m mm m          m mm m          m mm m     x
mmm m m         mmm m m         mmm m m  x      mmm m m  x      mmm m m  x
 m mmm           m mmm           m mmm           m mmm           m mmm      x
m mm mm         m mm mm         m mm mm         m mm mm         m mm mm
 m mmm           m mmm           m mmm           m mmm           m mmm
mmm m m         mmm m m         mmm m m  x      mmm m m  x      mmm m m  x
  Fig.7           Fig.8           Fig.9           Fig.10          Fig.11
```
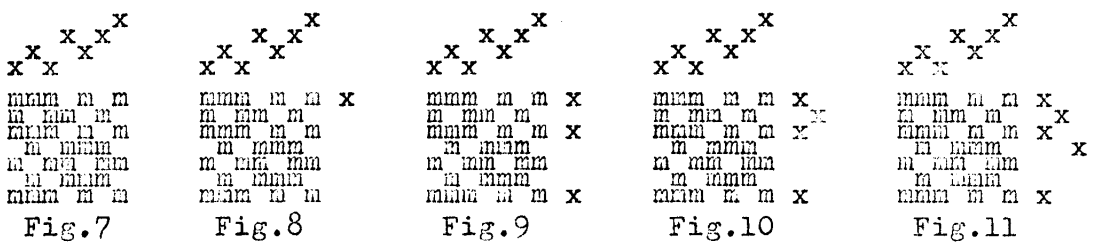
Once more we look to the right and we find one more end which
is different than all the other ends. It is the last one. There-
fore we place the cross above it on the fourth line (fig.7). This
completes our analysis of the threading draft.

The next step is to find the treadling (not the tie-up).
We proceed exactly as for the threading, but this time we examine
the picks of weft, instead of the warp, or the horizontal lines
instead of the vertical ones. We make a cross in line with the

first pick of weft (fig.8), and then look down to find whether
there are other identical picks of weft. If they are identical,
they can be woven on the same treadle. The third pick from the top
is the same as the first, and we make another cross under the
first one and in line with the third pick. The last pick of weft
is also identical with the first and the treadling mark is placed
under the first two (fig.9). Now we come to the second pick of
weft and make a cross in line with it and to the right of the marks
already made (fig.10). This of course means another treadle. No
other pick of weft is identical with this one, therefore we go to
the next one (the fourth). This as a new one is placed on the
third vertical line of the treadling (fig.11).

Fig.12   Fig.13   Fig.14   Fig.15

        The sixth pick is the same as the fourth, and we mark it in
the same line (fig.12. Then comes the fifth pick and it has no com-
panion; we mark it on the fourth vertical line of the treadling
draft (fig.13).

Fig.16

Fig.17

        Thus we have the threading and the tread-
ling but no tie-up. The latter is deduced from the
remaining parts of the draft. For instance: to
weave the first pick of weft we must have the frames
- 1,2,4 tied together to one treadle. To find this
out we look up from each black square of the exa-
mined pick of weft. In case of the first pick of
weft the black squares lie under the marks on
frames: 1,2,1,2,and 4. Therefore we mark these
three frames in the tie-up right above the treadle
(No.4) which has been used to make the first pick
(fig.14). The second shot of weft requires frames
1 and 3 (fig.15). The third is the same as the
first. The fourth was made on frames 2 and 3 as
in fig.16, and the fifth on frames: 1,3,and 4
(fig.17). The sixth pick is identical with the
fourth, and the seventh with the first. We have
now all the treadles necessary to weave the sample
which has been analised. The draft is now complete, with the
threading, tie-up, and treadling. We shall see in the next lesson
how the drafts resulting from an analysis can be rearranged to
suit our purposes.

* *

* *