OF YOUR CHOICE

Paul R. O'Connor

Color and weave effect twills on two to eight harnesses, with computer drawdowns

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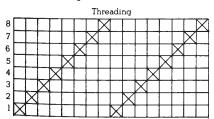
ISBN 0-934026-06-8 Library of Congress Catalog Card No. 81-81875 O'Connor, Paul R. A Twill of Your Choice Loveland, Colorado: Interweave Press, Inc. 173 pp.

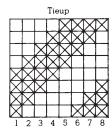
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ave you ever wondered how many different twills you could weave on straight draw twill threadings? Well, I did, and this book is the result. This project had its origin when I wove a skirt material in which I wanted twill bands with color gradations from grays and browns at the bottom of the skirt to light grays and beiges at the top. However, I wanted if possible to avoid any obvious twill patterns in these bands. The skirt was woven on a 4-harness loom with broken twill as the weave structure in the colored bands.

When I graduated to an 8-harness loom, I was curious to see if I could blend colors in twill weaves, again without developing noticeable patterns. This proved to be more of a challenge than I first realized. If you take the following twill threading on eight harnesses and one of the possible twill tieups, there are $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ or 40,320 different ways to treadle where all treadles are used before





repeating any of them. For example, the treadle order might be 12345678 or it might be 56123478. There are only 40,318 other possibilities! By rather laborious methods I

convinced myself that there are many duplicates and that there are 320 different twills for straight draw threading of eight harnesses (not counting the reverse or mirror image of a pattern as different). Although this is not an impossible number to draft by hand, I was fortunate to have my son volunteer to develop a computer program which could print out these patterns for me.

The computer program is based on straight draw threading, and up to 20 harnesses can be programmed. The treadle tieup, the treadling sequence and the warp and west colors (black, white and two shades of gray) can be chosen in any mannner desired. The number of possible patterns with all these variables is immensely large and one could spend a lifetime generating computer printouts. There are over 1800 patterns in this book and you'll probably find it a real challenge to decide which one of them is just the pattern that you want to weave. My hope is that this collection of twill patterns will be useful as a reference to fellow weavers. At least, the task has been completed and will not have to be duplicated!

How to determine the number of different twill patterns

Here's how you can determine the number of different twill patterns that can be woven with a certain number of harnesses, using only 3-harness and 4-harness examples. Consider straight draw threading on three harnesses. There are, of course, two different tieups. The first tieup gives a 1/2 twill and the second gives a 2/1 twill. The

reduced to four different patterns. These correspond to the treadling sequences:

12345 (straight twill)

12354 (broken twill A)

12453 (broken twill B)

13524 (satin twill)

A summary here will help. Table I gives the number of different twill patterns that can be woven using the number of harnesses indicated. REMEMBER: The threading is always straight draw, all treadles are to be used once before using a treadle a second time, and the reverse or mirror image pattern is not counted as different.

Table I. Twill Patterns versus Number of Harnesses

	Number of different		
Number of Harnesses	twill patterns		
2	l (usually called tabby)		
3	1		
4	2		
5	4		
6	14		
7	52		
8	320		

I have no idea how many patterns there are for more than eight harnesses but clearly the number goes up very rapidly.

Some comments and suggestions

The remainder of this book is divided into sections based on the number of harnesses to be used. For 2-, 3- and 4-harness weaves, there are 21 different warp and weft color combinations. For 5-, 6-, 7- and 8-harness weaves, there are six warp and weft color combinations for each treadling sequence. Even so, the number of patterns presented is very large and it becomes bewildering to choose the one you may want to weave. I would recommend that you cut a template out of paper or cardboard so that you can look at one pattern at a time.

Colors in the warp and weft are indicated above each twill pattern. **W** specifies white and **B** black. In 2-, 3- and 4-harness patterns, the weft sequence is BBWW; in 5-, 6-, 7- and 8-harness patterns, it is BWWB. In many examples this only shifts the pattern without changing it.

The photographs of the woven samples beginning on p. 000 are keyed to indicate the treadling sequence, the page, and the warp-west color sequences so that you can compare the computer printout with a woven sample. The key will have the form:

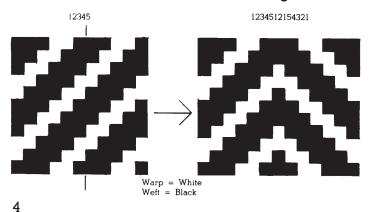
123654 W 64 B

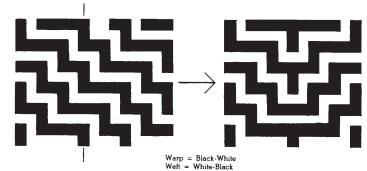
and means: this pattern appears on page 64, the treadling sequence is 123654, and the warp is white, the weft is black. The samples were woven with 3-ply Maypole wool at 24 ends per inch.

Some additional points to consider:

- A. The weave structure can always be read from the first pattern given in any treadling sequence where the warp is white and the weft is black.
- B. If you want a pattern to slant in the opposite direction from the one shown, all you have to do is reverse the number. For example, 12345 is a twill slanting up to the right while 54321 slants up to the left.
- C. By using a mirror you can see what point twill threading will give you for each of the treadling sequences. Here are two examples of this. The vertical line represents a mirror held at this point. By using two mirrors at right angles you can develop goose eye patterns.

Mirror reflection of twill threading





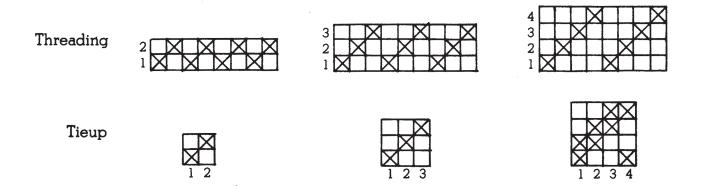
- D. In all examples there are at least two warp repeats and two complete treadling sequences. However, for fiveand seven-harness patterns and for some color weave effects, this gives only one pattern repeat rather than two.
- E. Different color combinations in different sections of the same warp can be used side by side without affecting the weave structure. You can place the patterns next to each other to see what the overall pattern would be.
- F. You can change from one treadling sequence to another at any point you desire. Similarly you can change from one color sequence in the weft to another whenever you want. You can anticipate the result by placing patterns from this book above one another.
- G. The lowest possible number for the treadling sequence has been assigned. When only one number is assigned, this means that the pattern is the same whether

viewed right side up or upside down. When two numbers are indicated for a pattern, then the first number is for the pattern as presented and the second number corresponds to the treadling sequence when you look at the pattern upside down. For 6- and 7-harness patterns, both treadling sequences are presented separately but for 8-harness patterns only the lower number of the two is given so turn the book upside down to see the other treadling sequence.

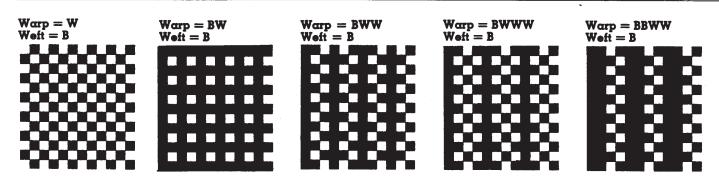
H. You will find that the patterns fall into groups: twill lines to the right or left; horizontal or vertical lines; herringbone or chevrons; blocks; and complex patterns. The last type is best if you want to blend colors and avoid a definite pattern.

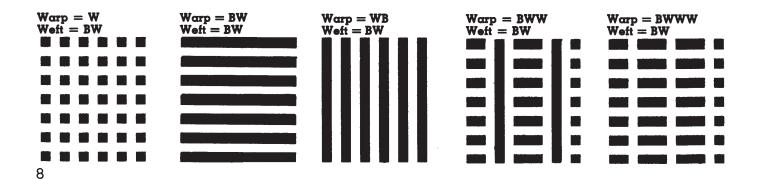
2-, 3- and 4-Harness Twills

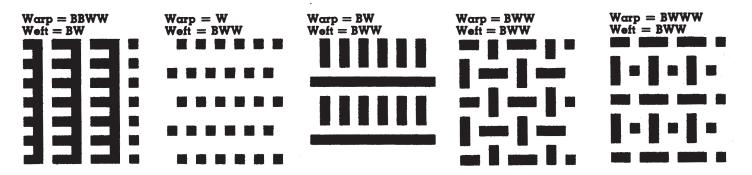
The threadings and tieups that have been used for the computer printouts are given here.

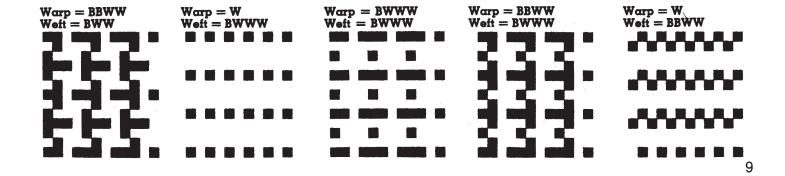


Treadling Sequence 12 (see photo p. 158)



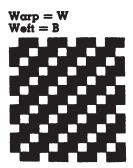


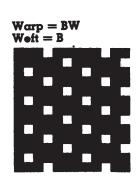


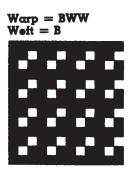


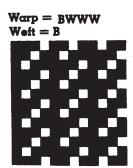


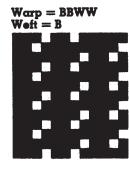
Treadling Sequence 123 (see photo p. 159)



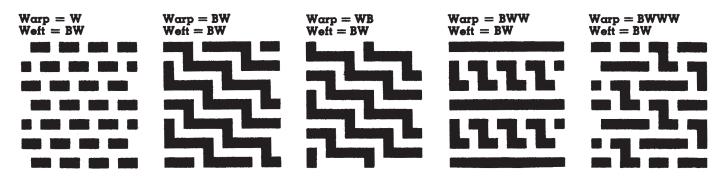




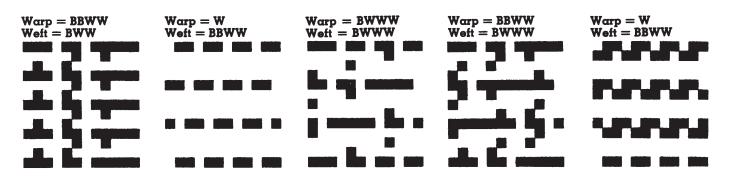


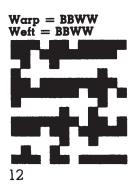


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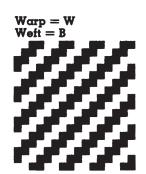


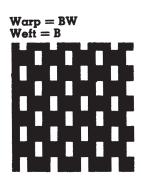


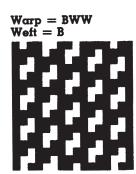


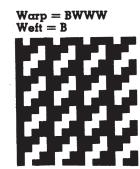


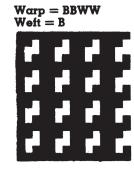
Treadling Sequence 1234 (see photo p. 160)



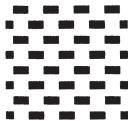








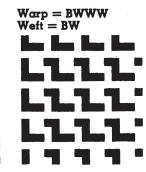


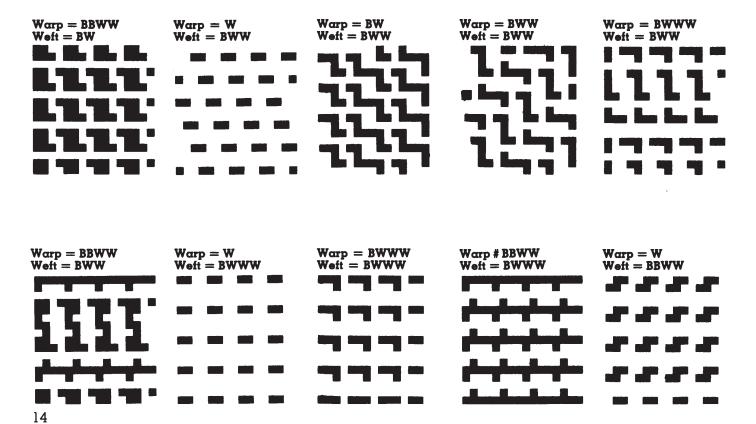


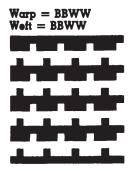




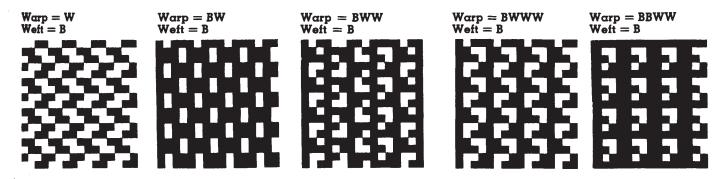


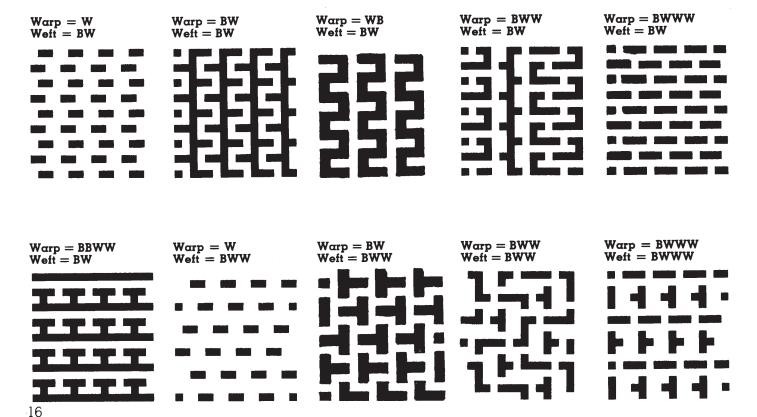




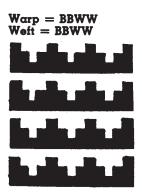


Treadling Sequence 1243 (see photo p. 161)



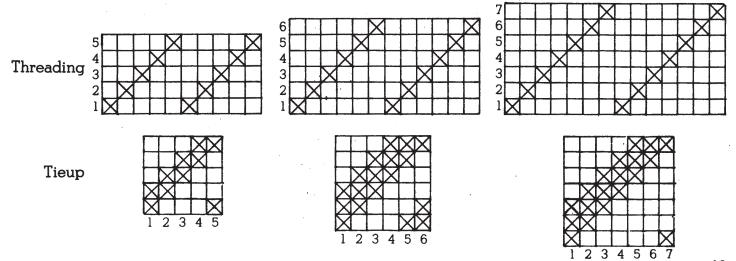


Warp = BBWW Weft = BWW	Warp = W Weft = BWWW	Warp = BWWW Weft = BWWW	Warp = BBWW Weit = BWWW	Warp = W Weft = BBWW
1444			2.2.2.2	
7777		3333	3333	
5555			1111	
1444			-	

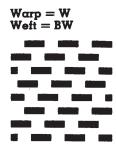


5-, 6- and 7-Harness Twills

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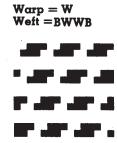


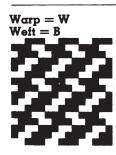




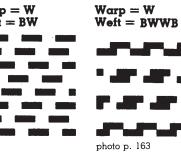


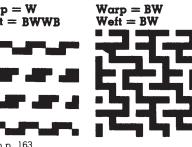
photo p. 162

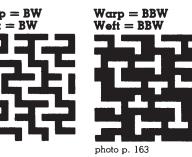
photo p. 162





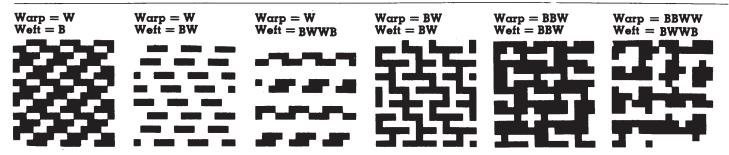


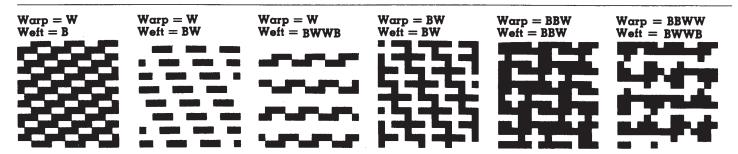


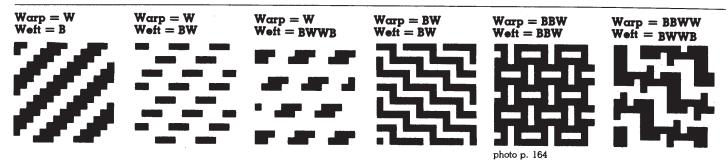


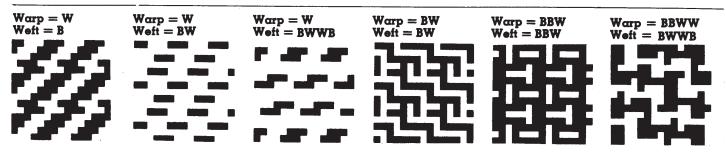


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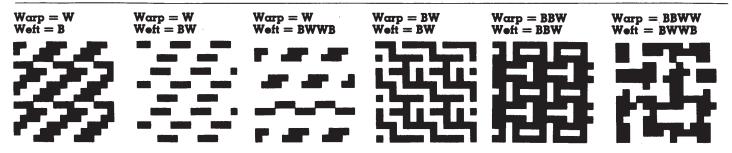




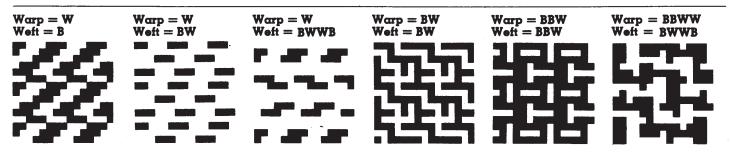


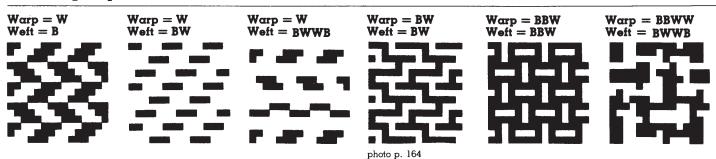


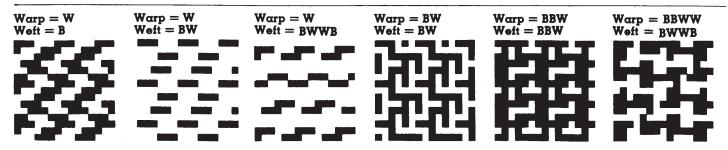
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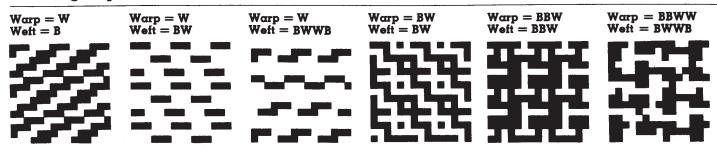


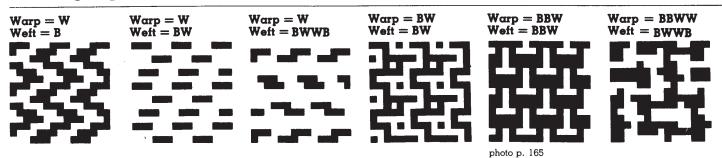
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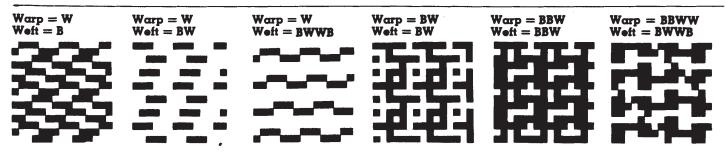




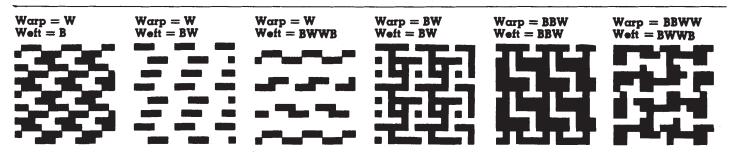


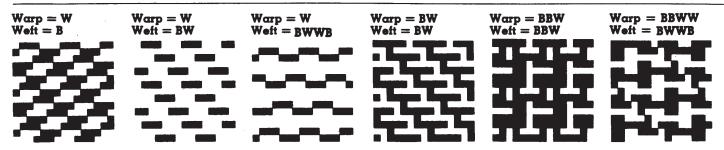




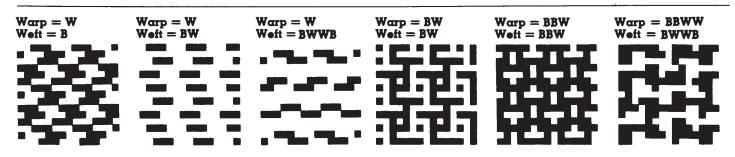


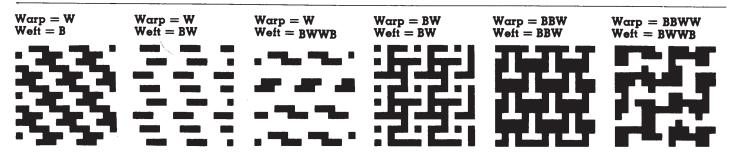
Treadling Sequence 125463 (126354)





Treadling Sequence 126354 (125463)





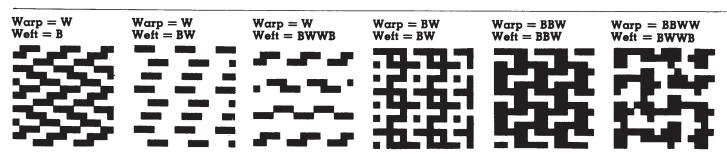
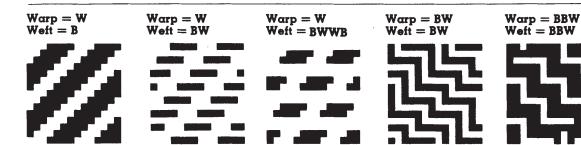
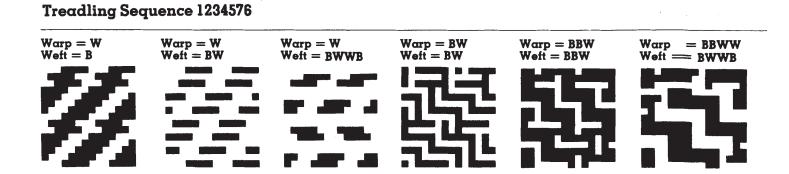


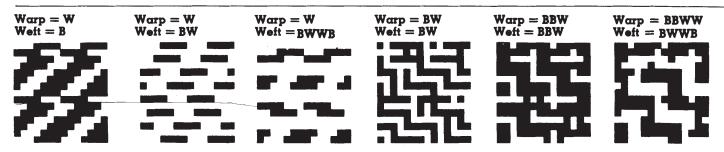
photo p. 165



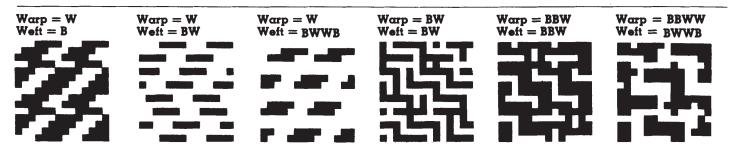


Warp == BBWW Weft == BWWB

Treadling Sequence 1234675 (1234756)



Treadling Sequence 1234756 (1234675)



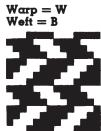
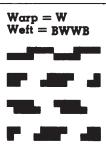


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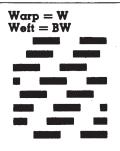










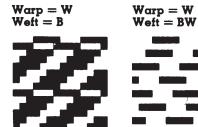




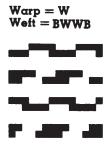








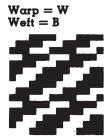


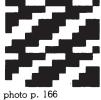


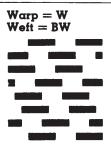


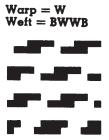










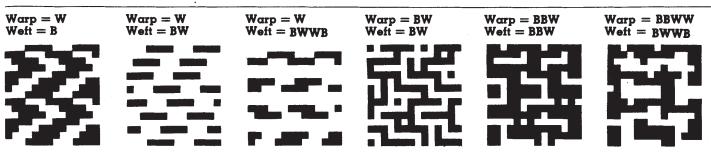


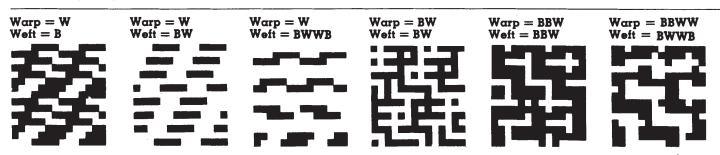




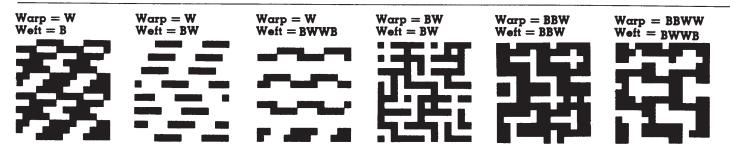


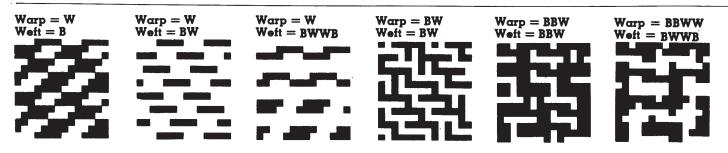
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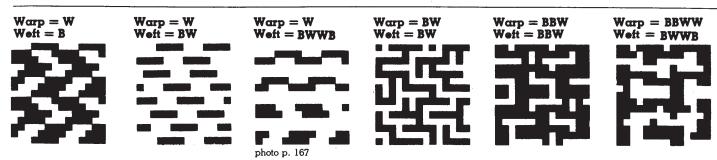




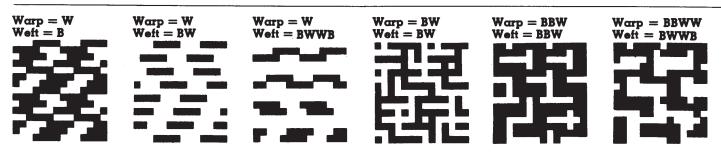
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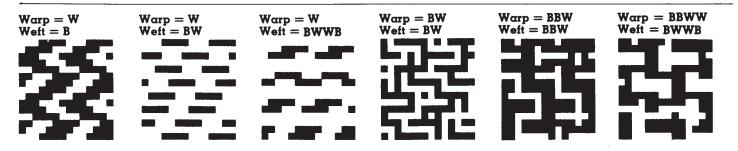




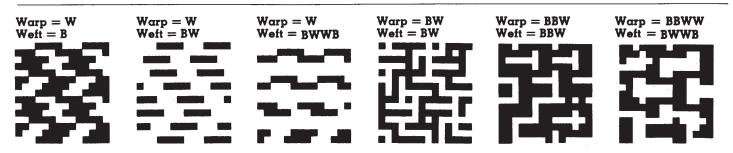
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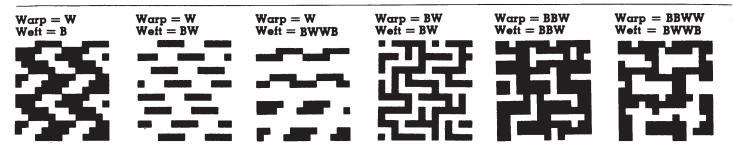
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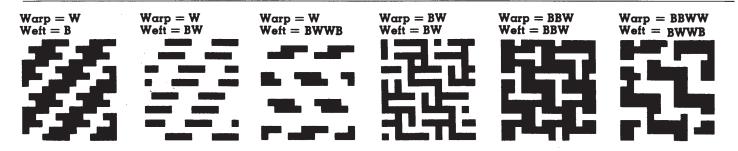


Treadling Sequence 1237564 🗸

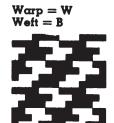


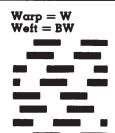
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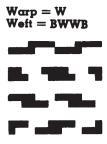




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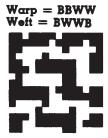


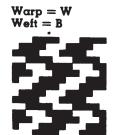


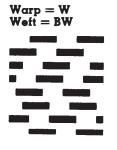










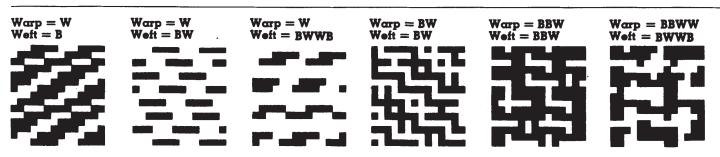


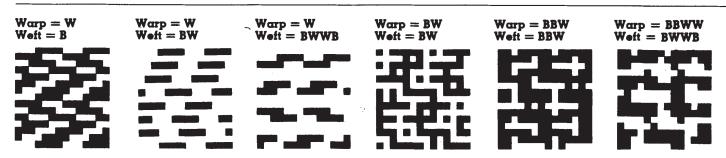




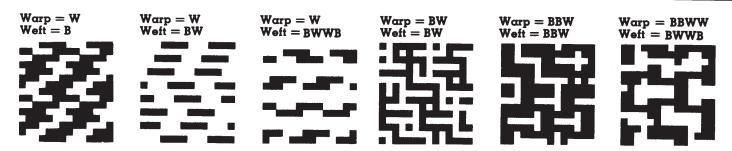


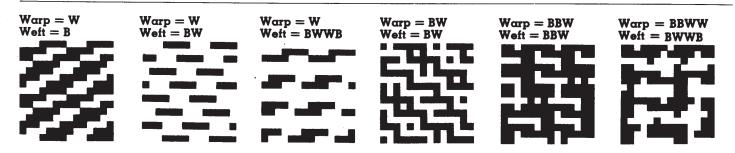




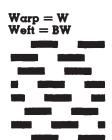


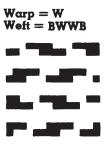
Treadling Sequence 1246573 (1273546)





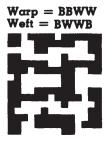






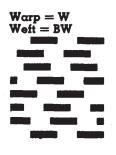


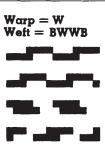




Treadling Sequence 1247365 (1254736)



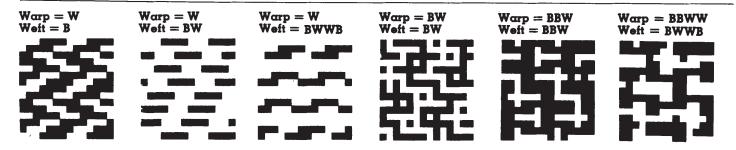




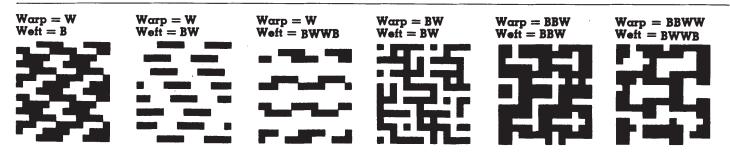




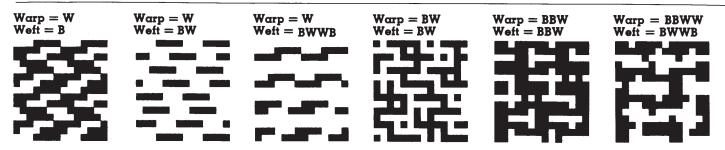




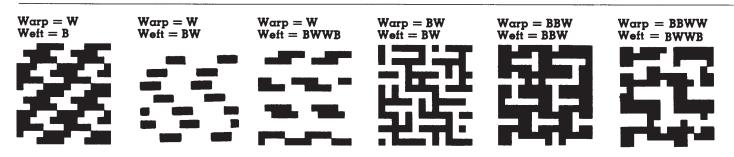
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Treadling Sequence 1247635 (1253764)

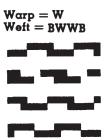


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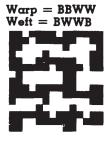








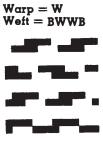


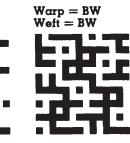


Treadling Sequence 1253746 (1246375)





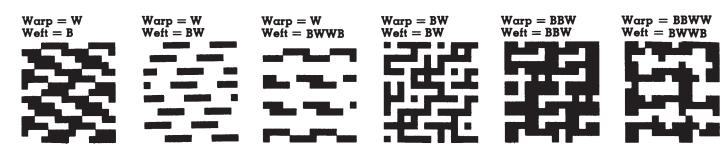




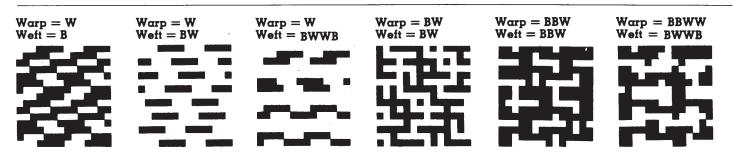




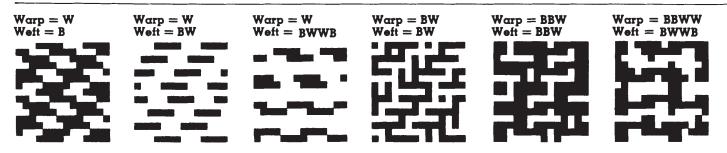
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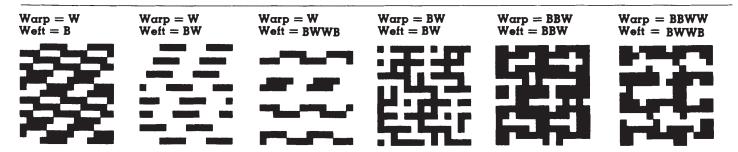


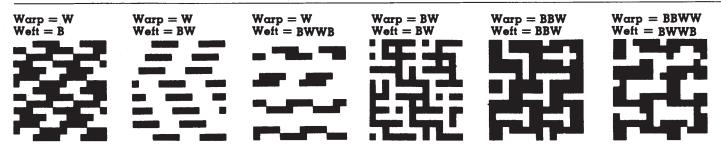
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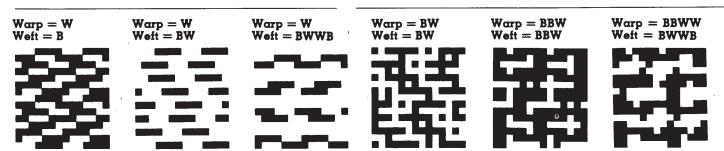
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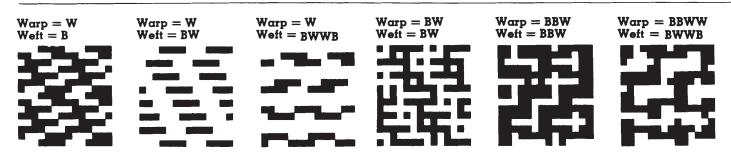




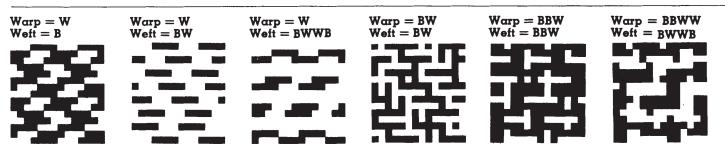
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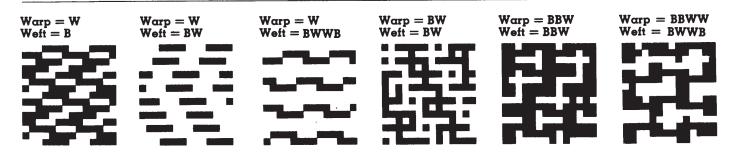


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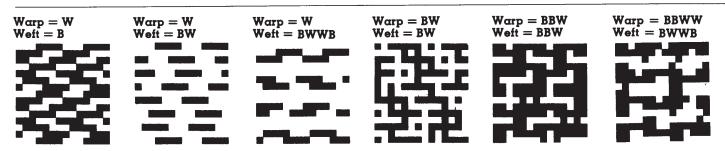


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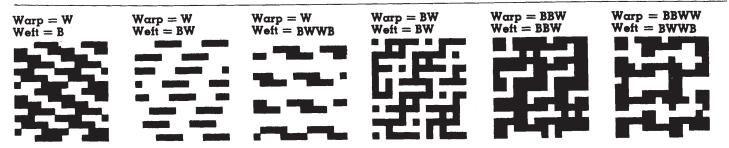


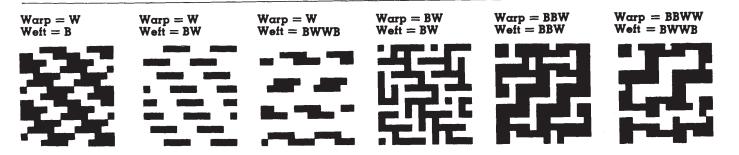


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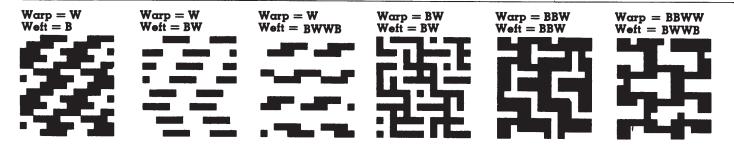


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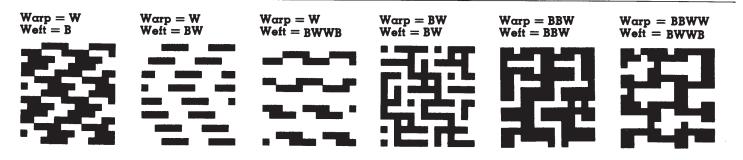




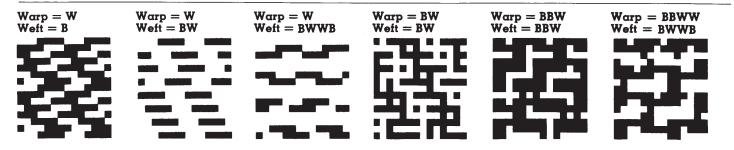
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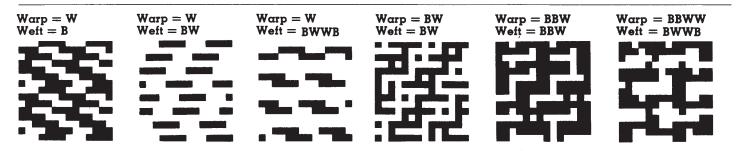
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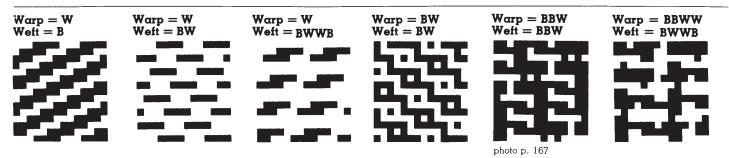


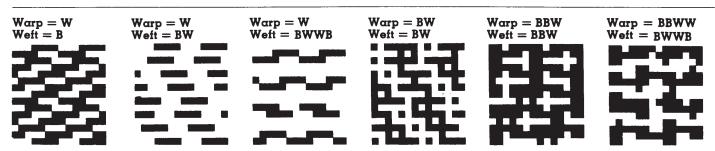
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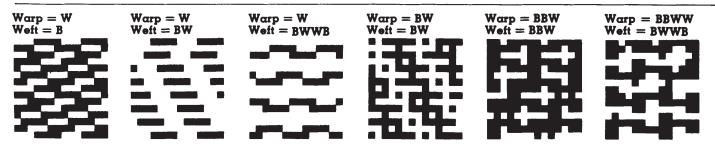


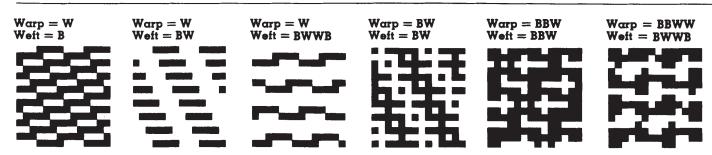
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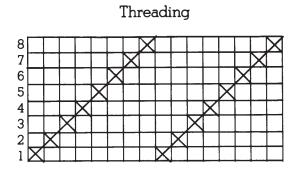


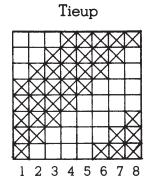


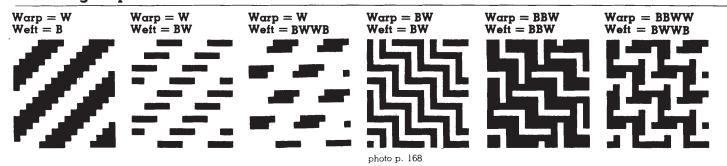


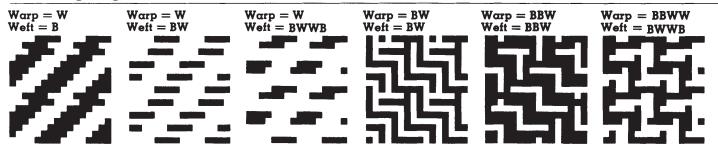
8-Harness Twills

The threading and tieup that has been used for the computer printouts is given here.

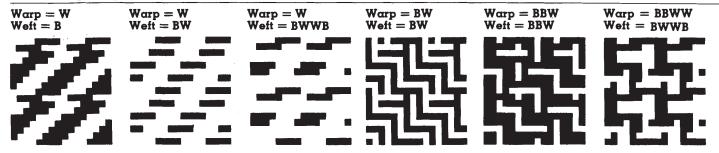


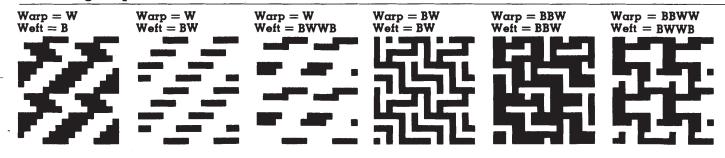


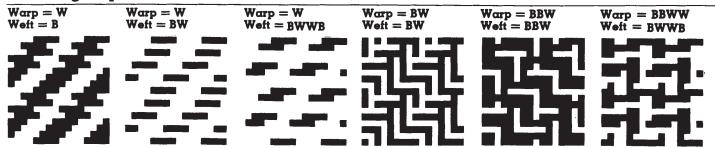




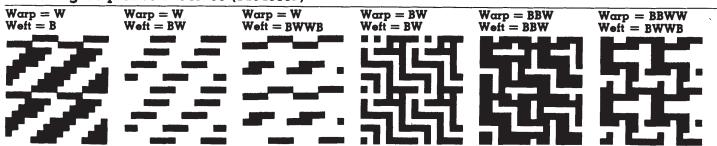
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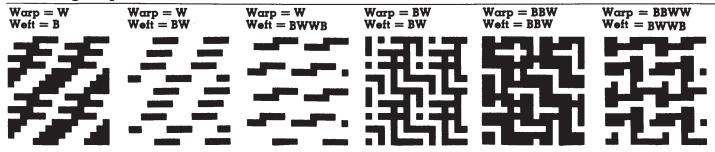




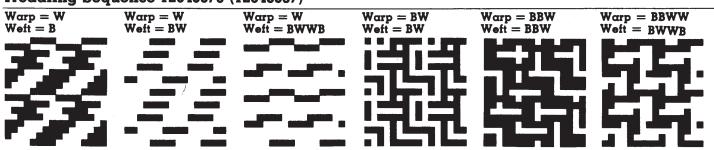


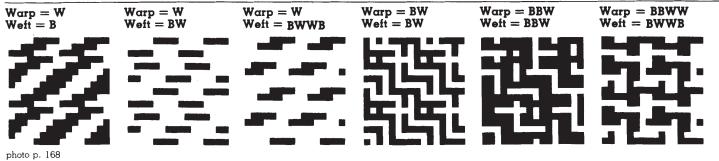
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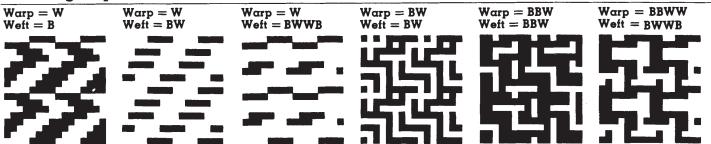


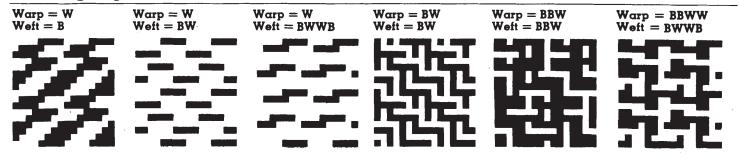
Treadling Sequence 12346875 (12348657)



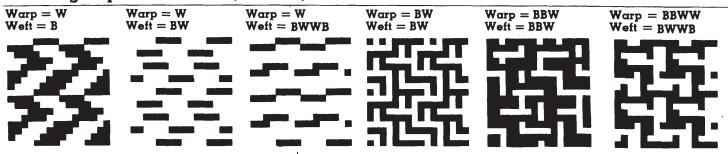


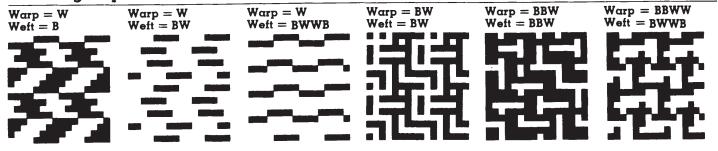
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Treadling Sequence 12347865 (12348756)





Treadling Sequence 12348765

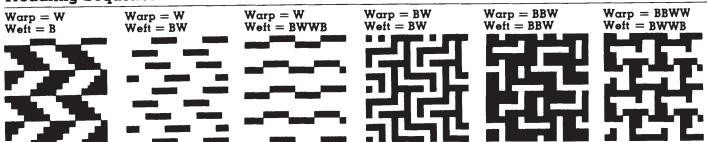
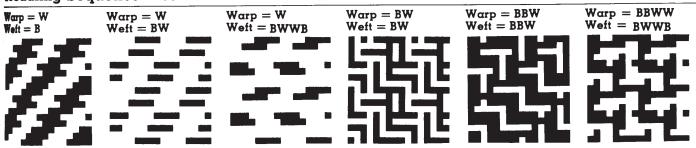
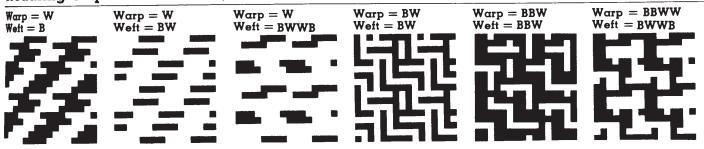


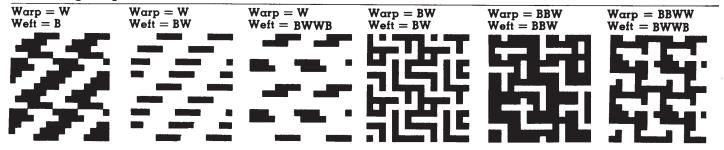
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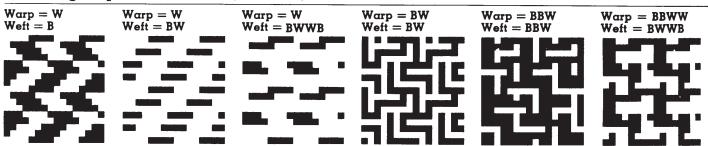
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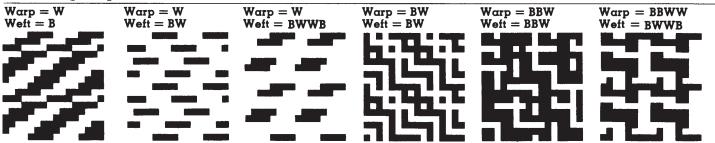
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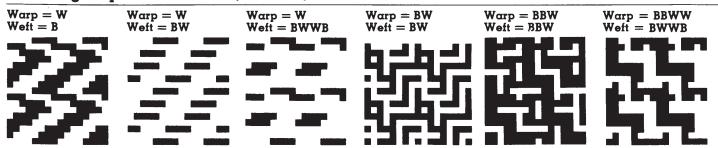
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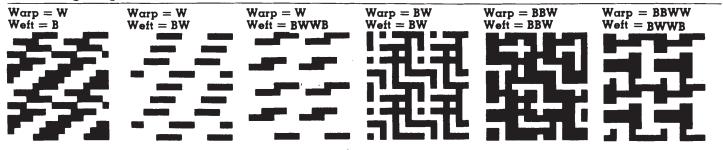
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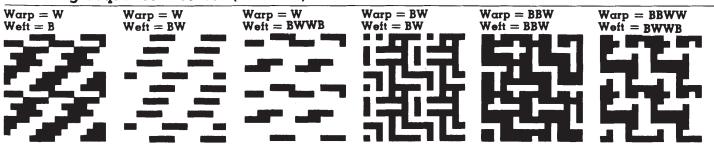
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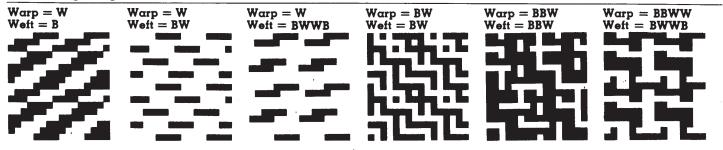
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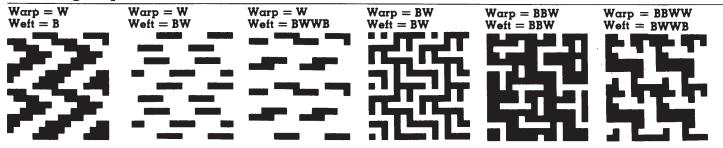
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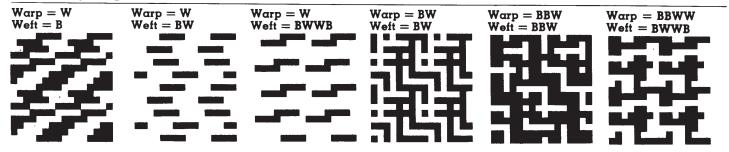
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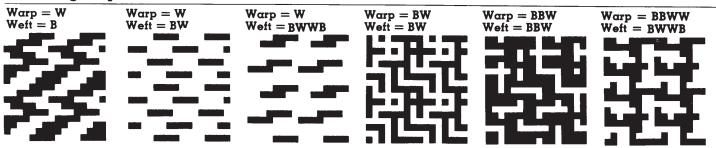


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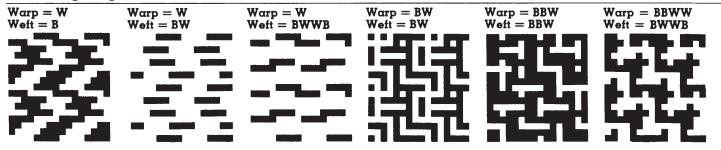


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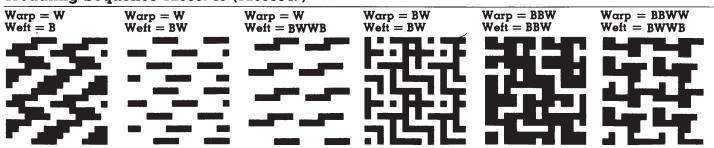


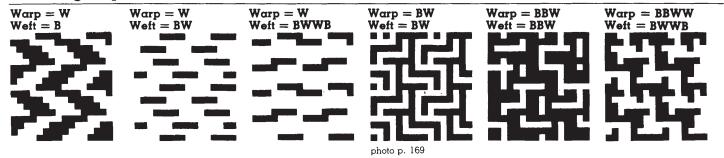


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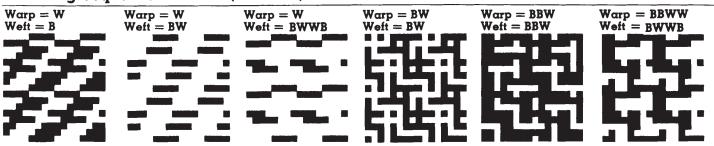


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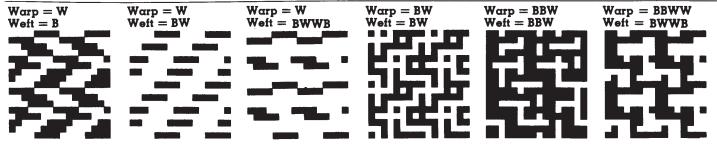




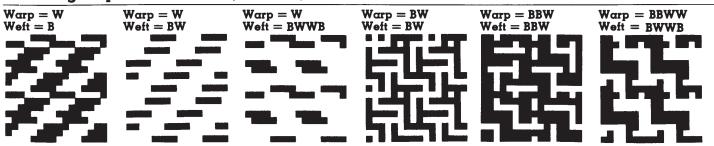
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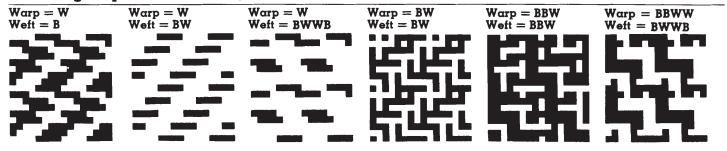
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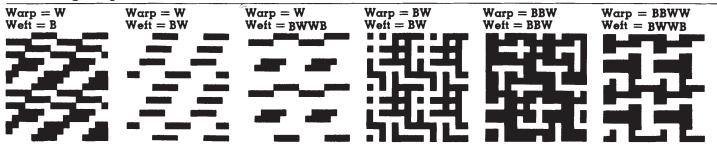
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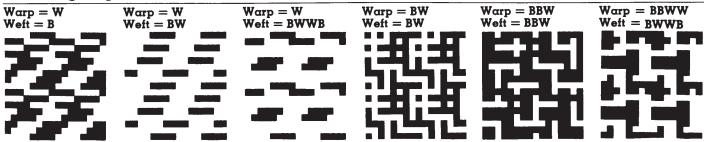
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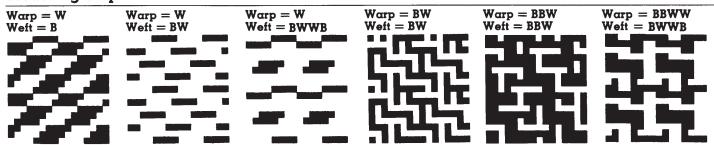


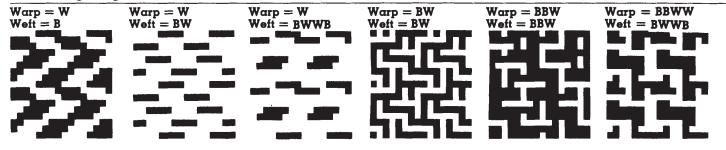
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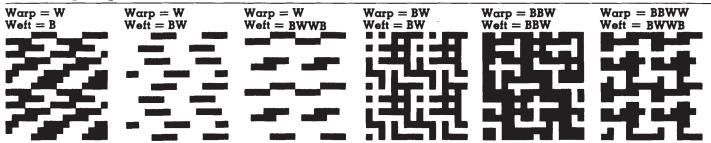
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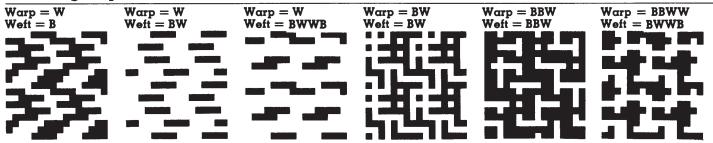




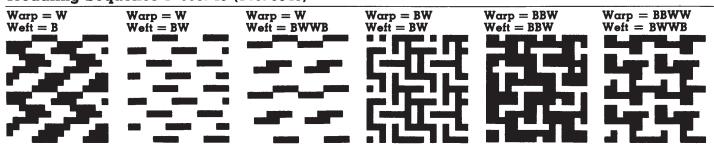
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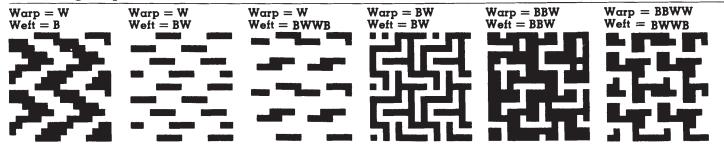
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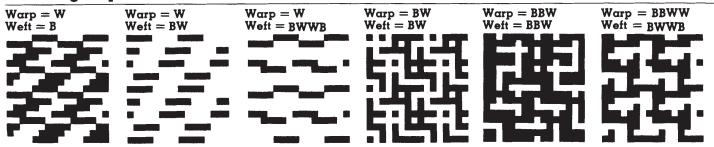


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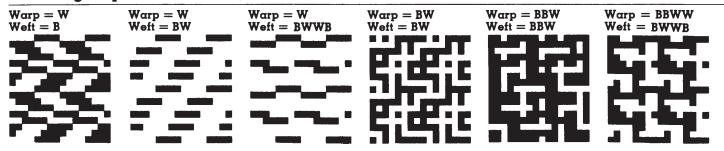


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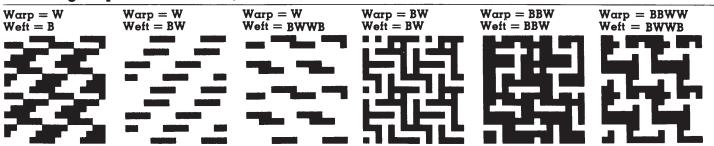




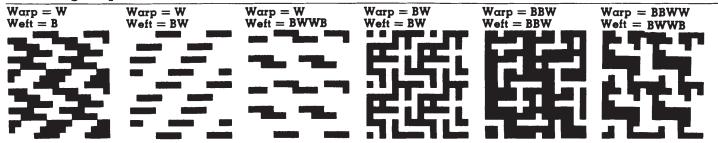
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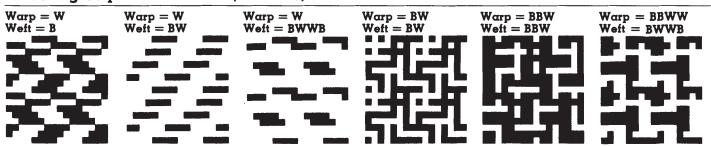
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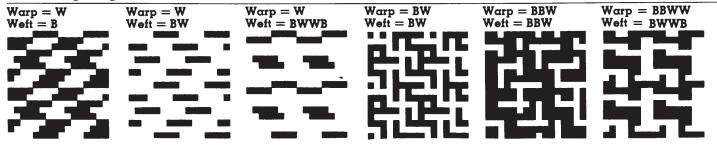
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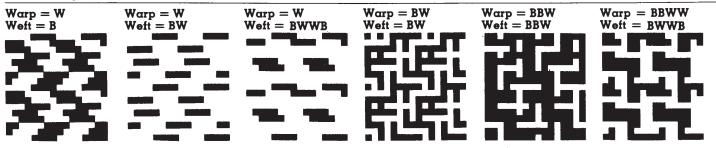
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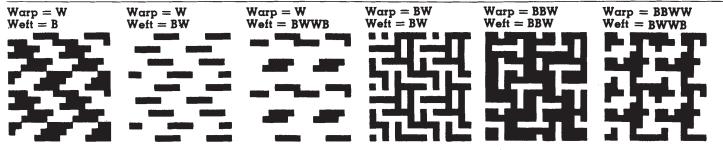
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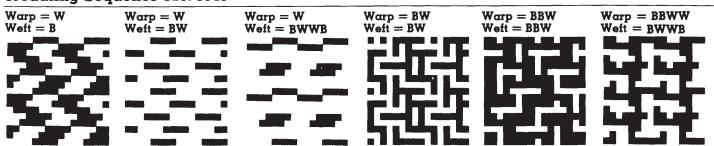


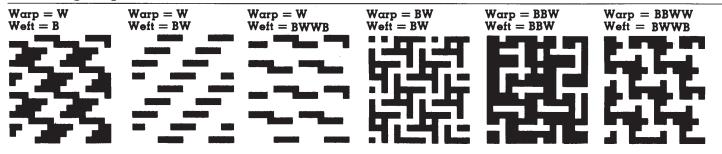
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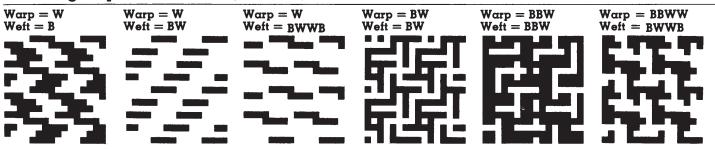
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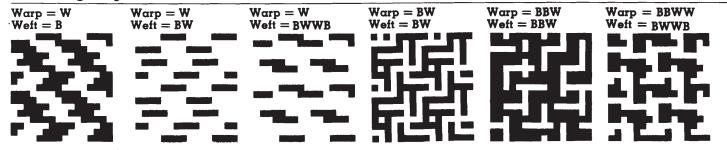


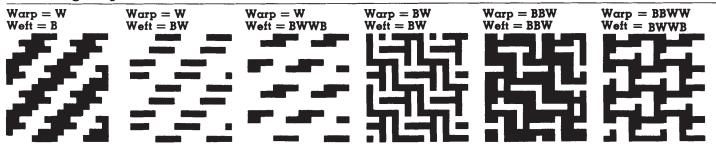


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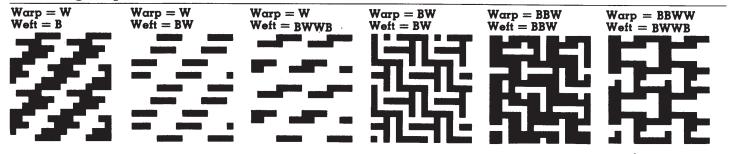


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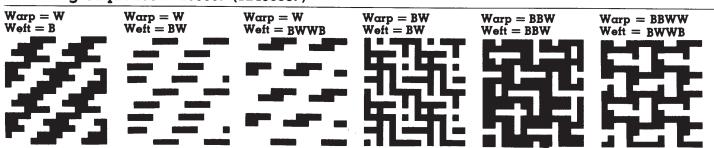


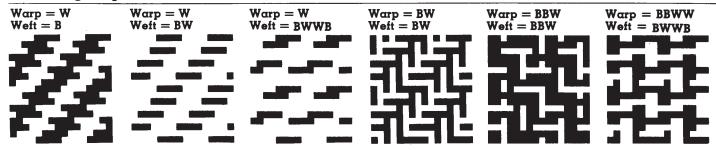


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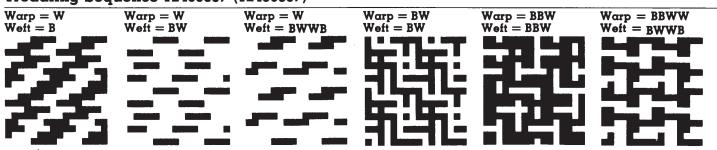


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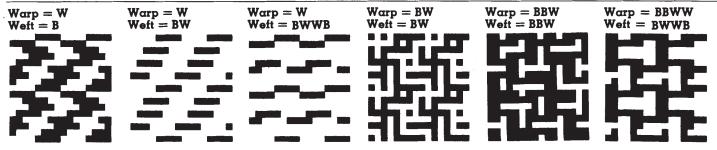




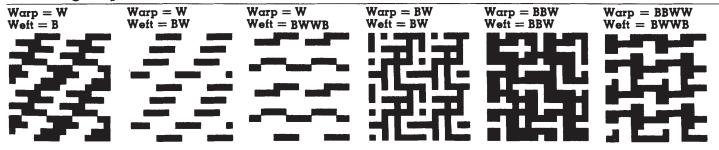
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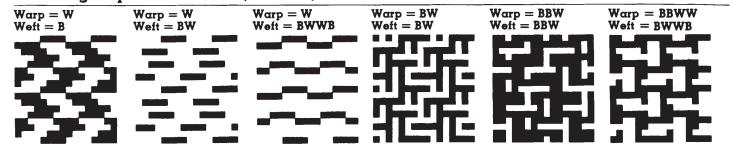
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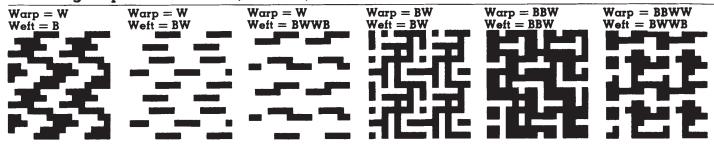
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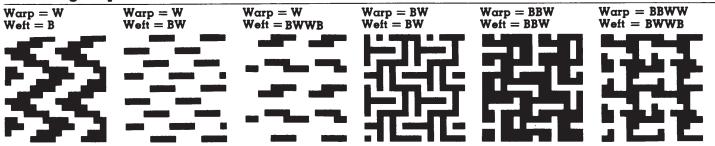
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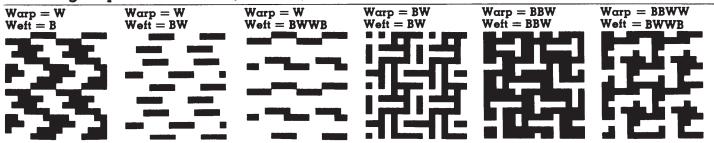
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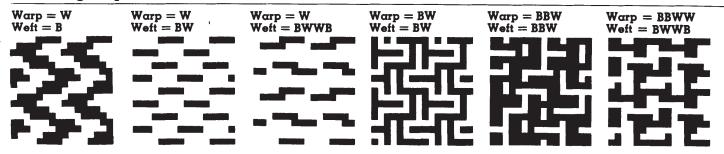


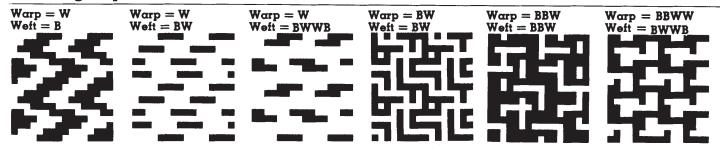
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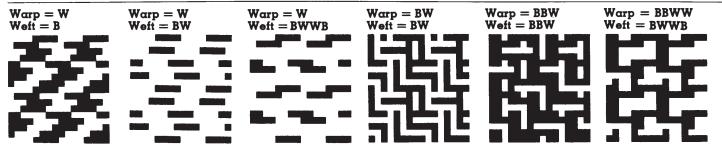
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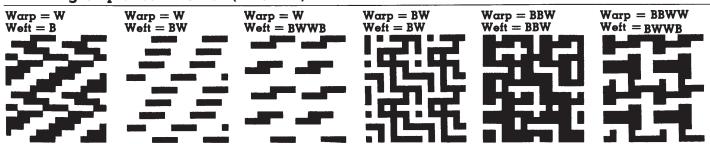


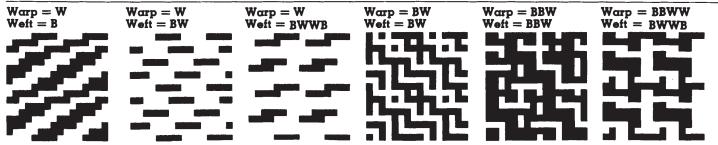


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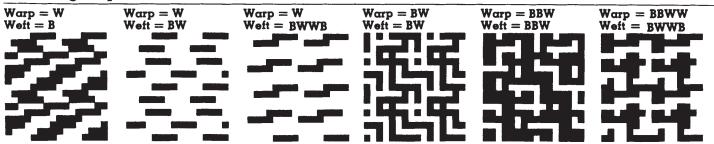


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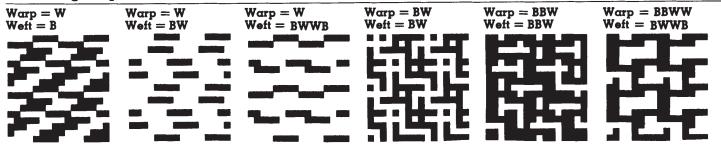


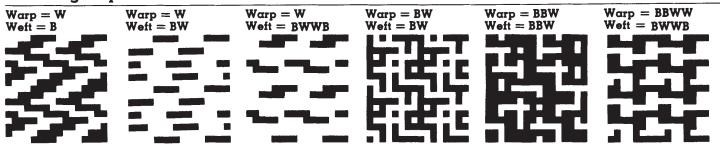


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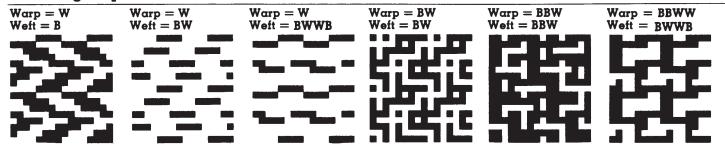


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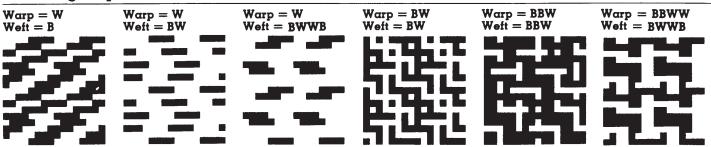




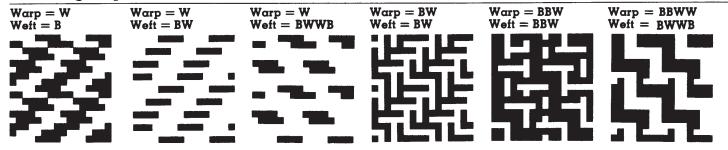
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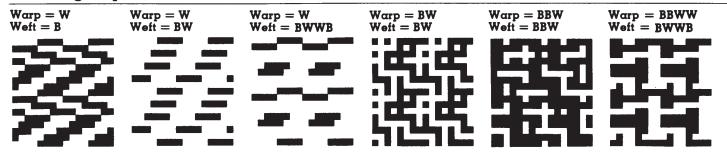
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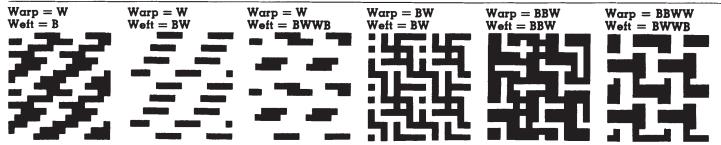


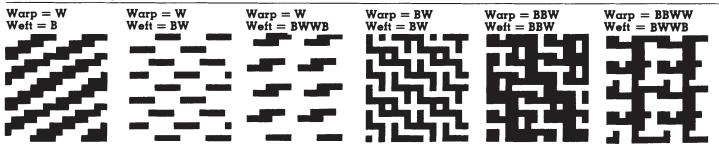
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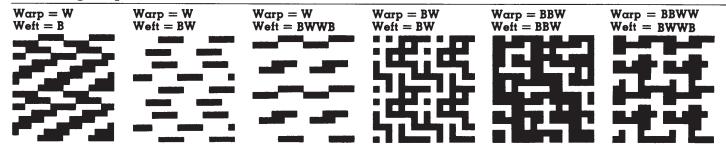
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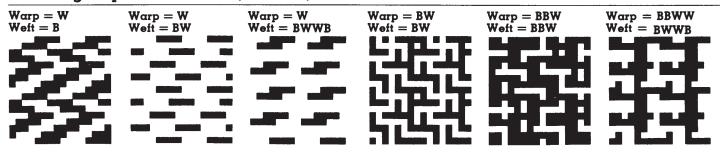




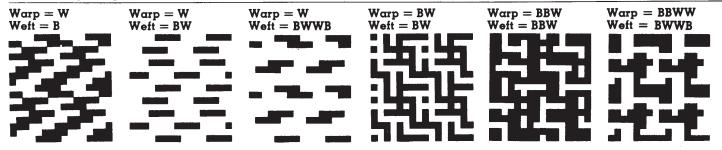
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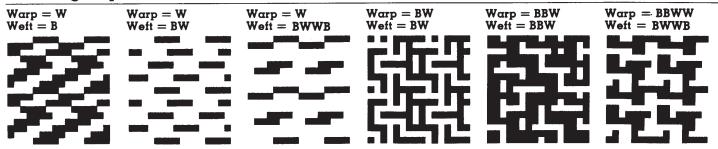
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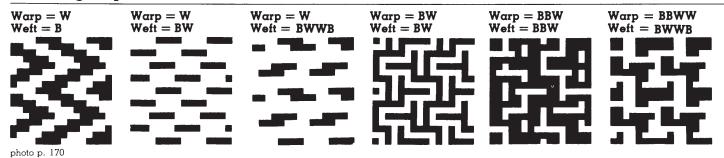


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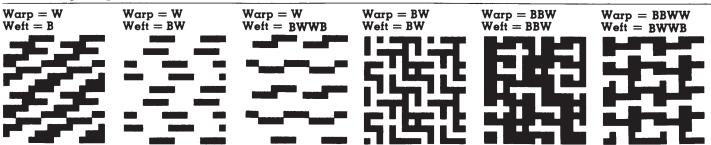


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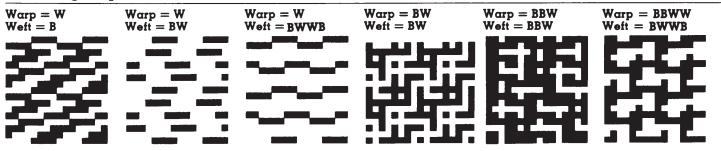




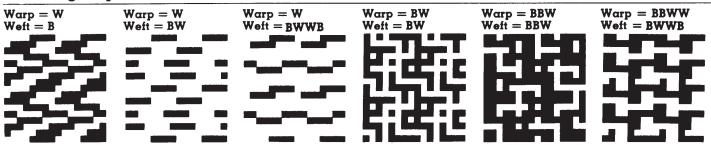
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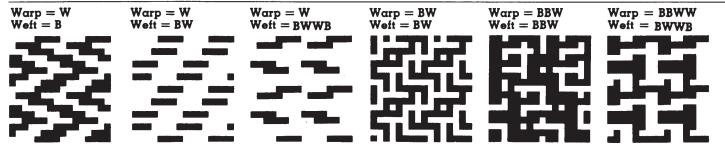
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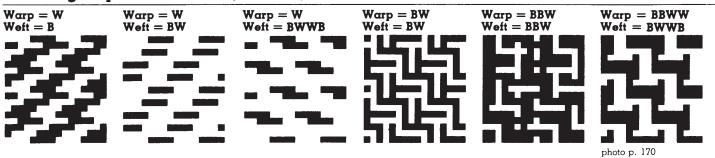
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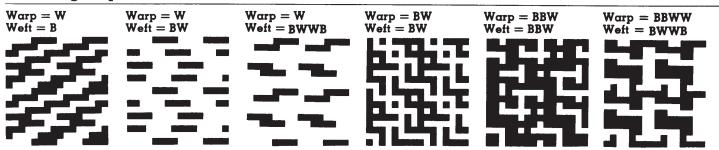
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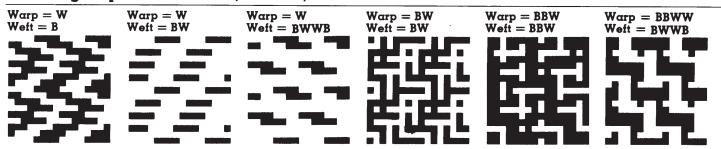
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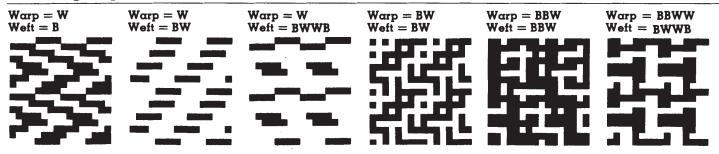
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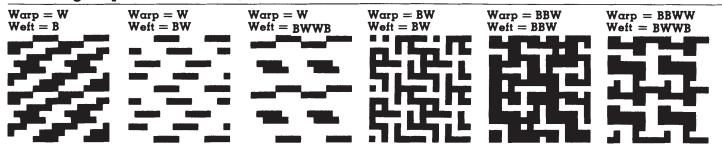
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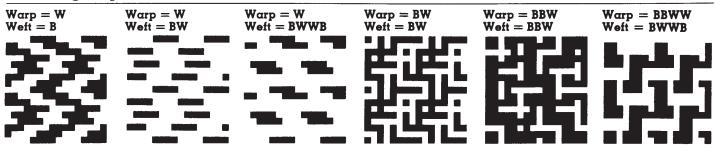
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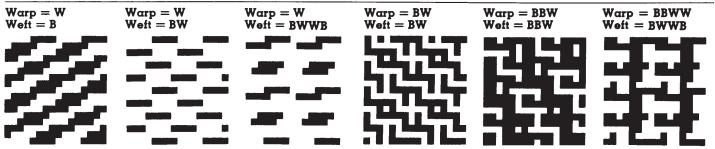


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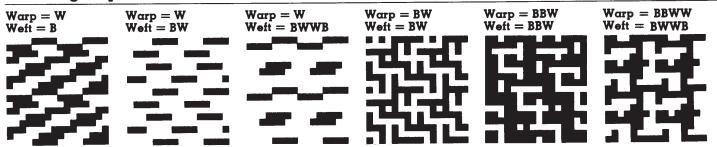


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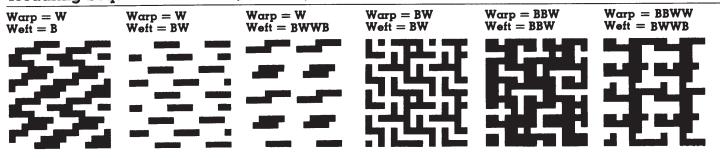




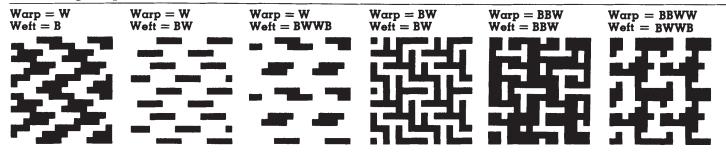
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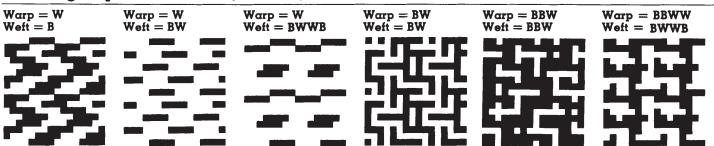
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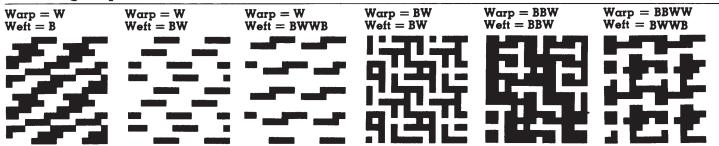
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Treadling Sequence 12478635 (12578463)



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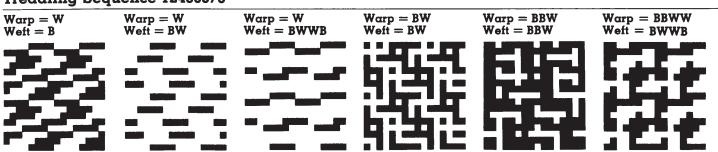
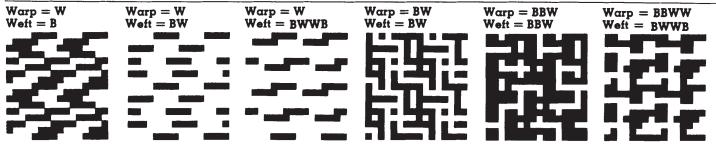
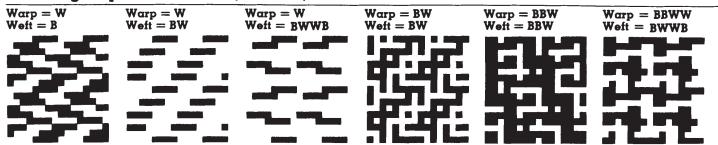


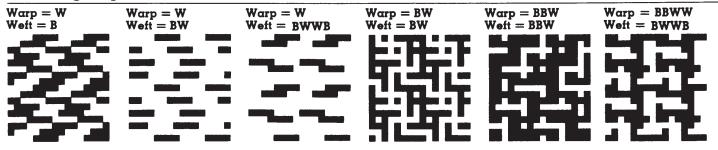
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Treadling Sequence 12483756 (12564837)

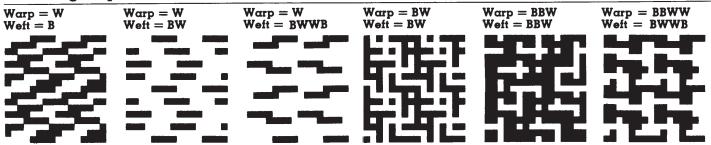


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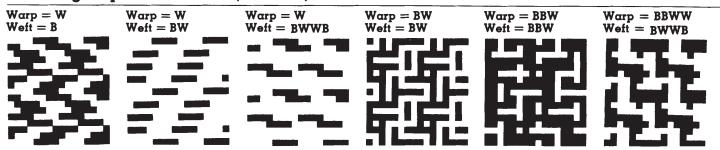




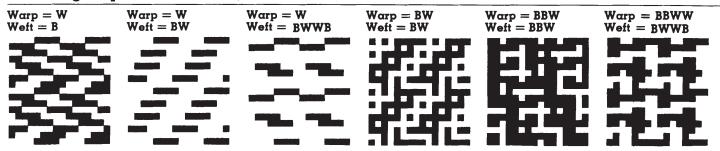
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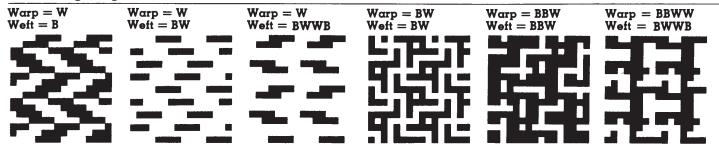


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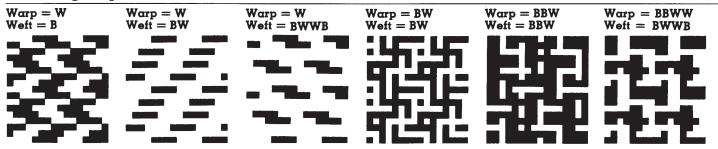


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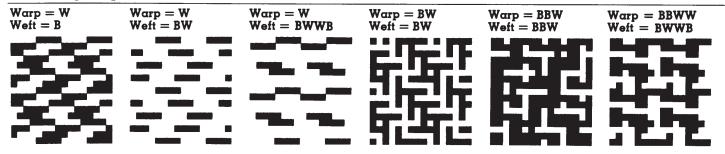




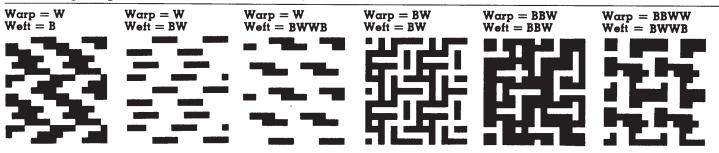
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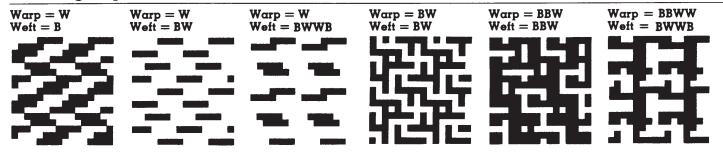


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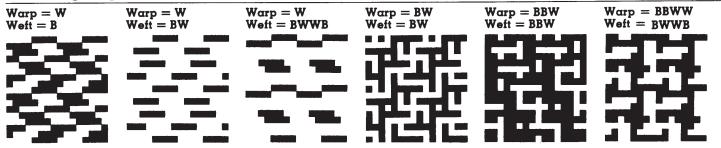


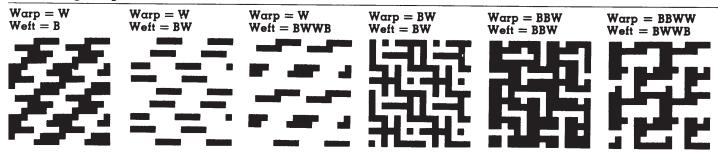
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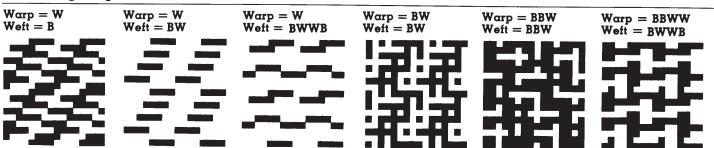




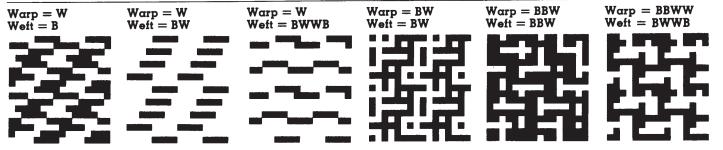
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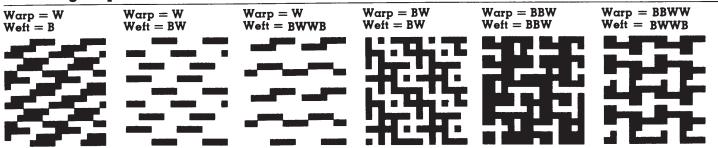




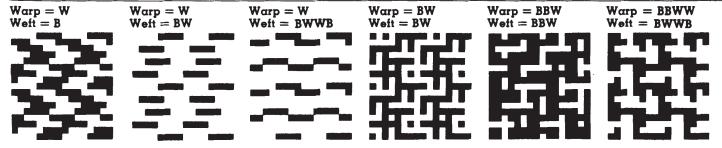
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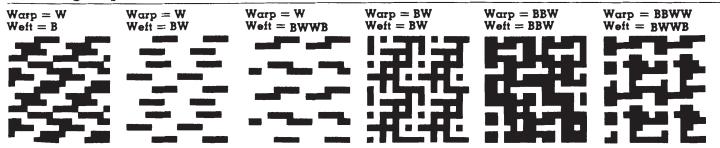
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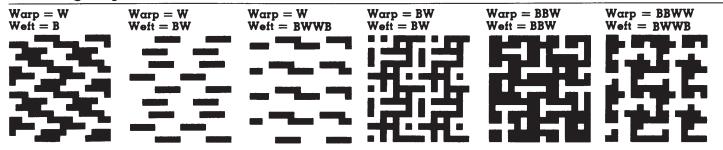
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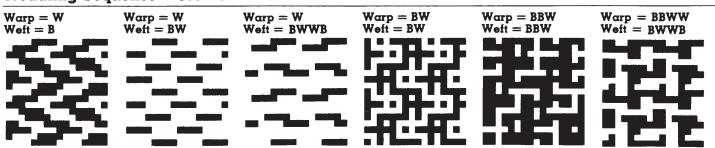


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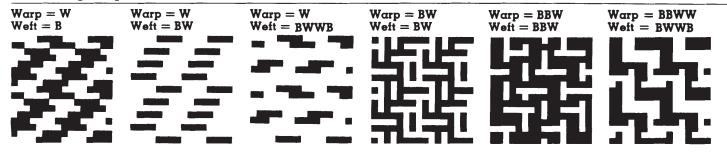


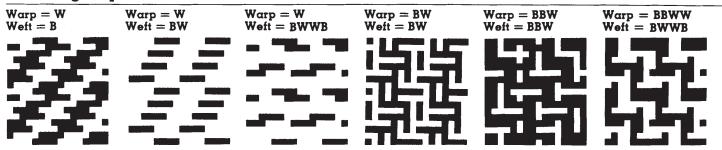
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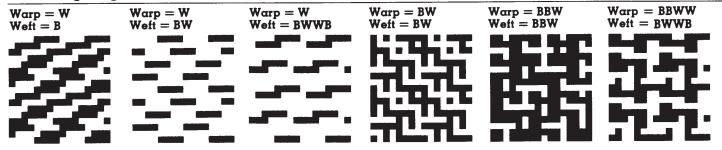


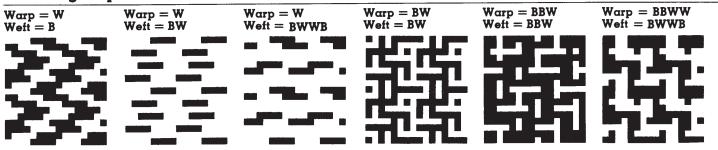


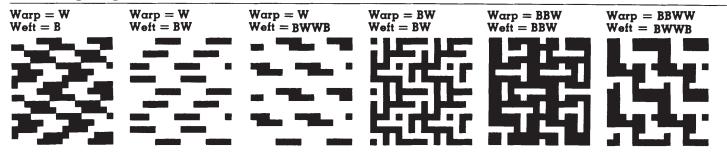
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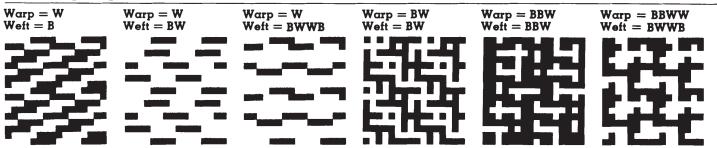


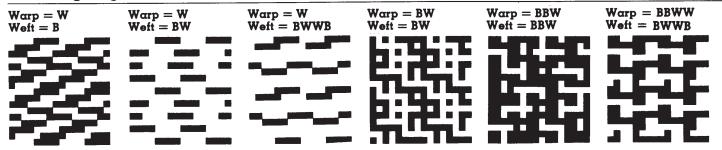


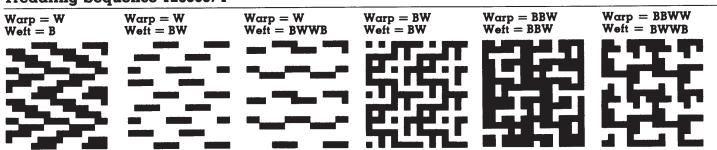


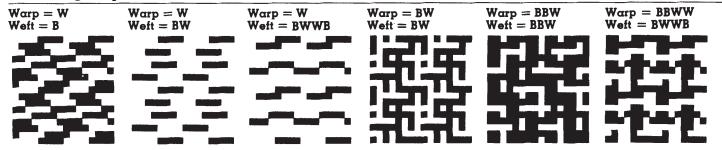


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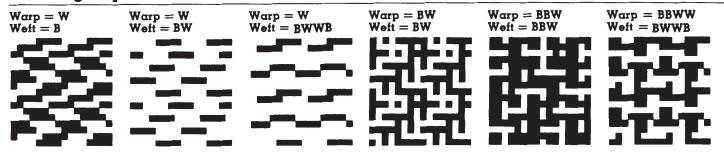


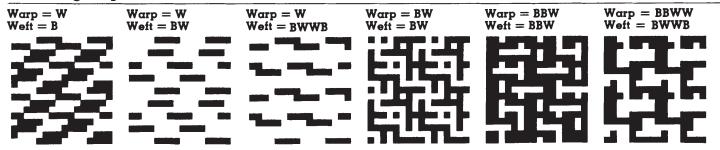




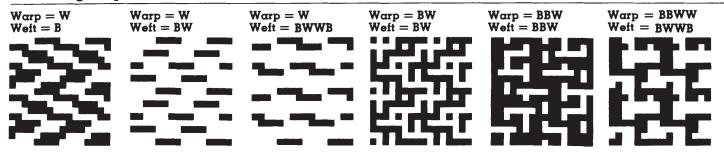


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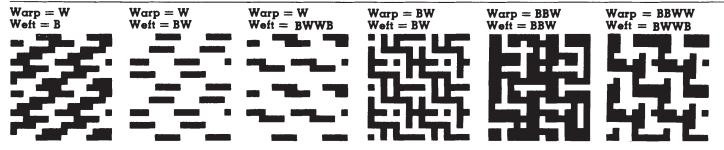




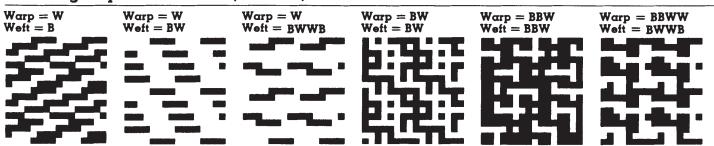
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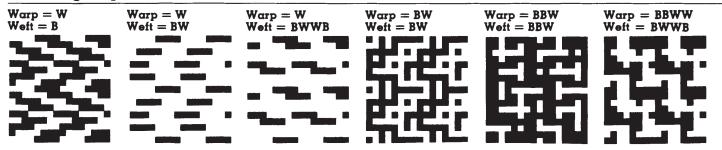
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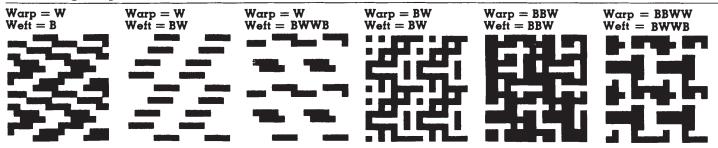
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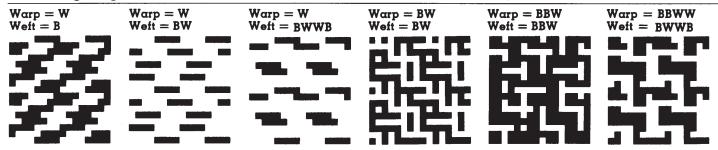


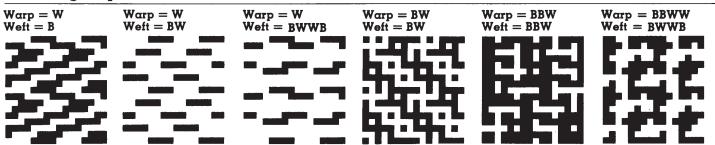
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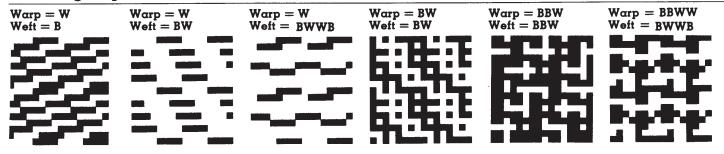


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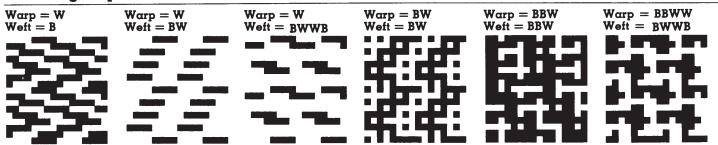




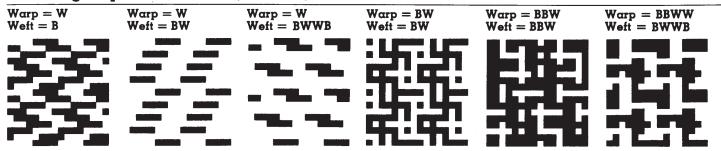




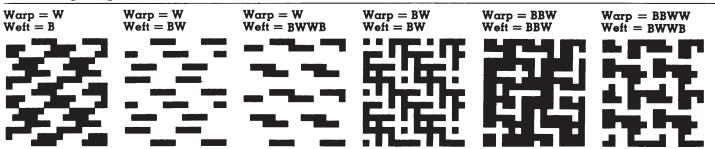
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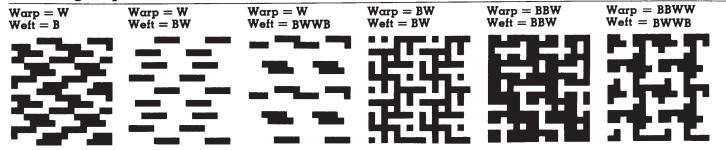
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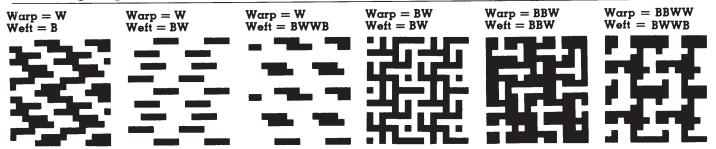


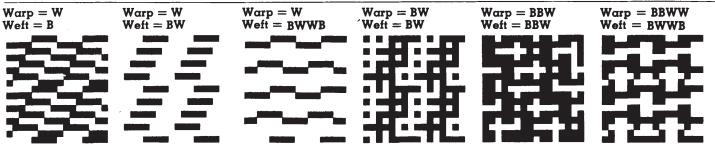
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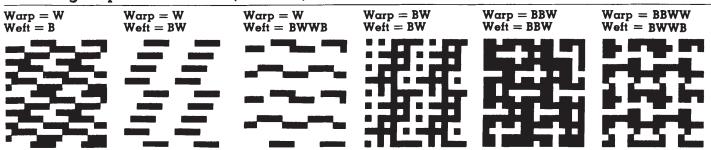
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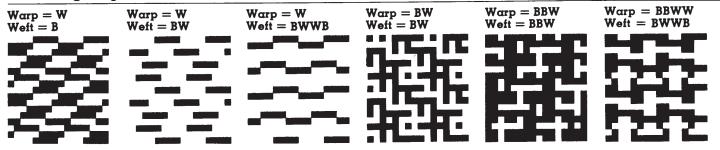




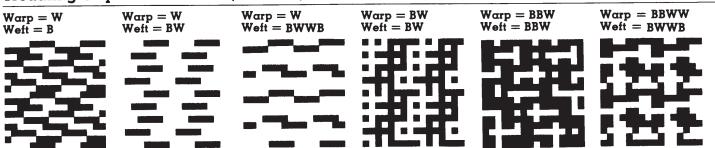


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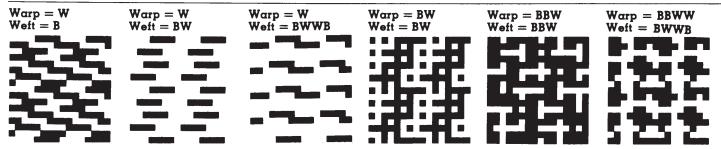




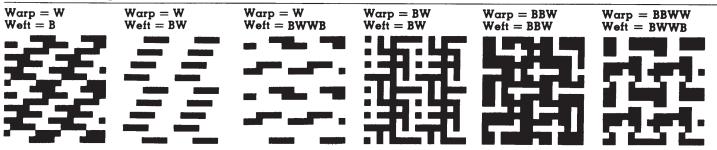
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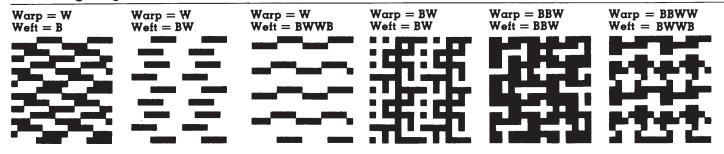


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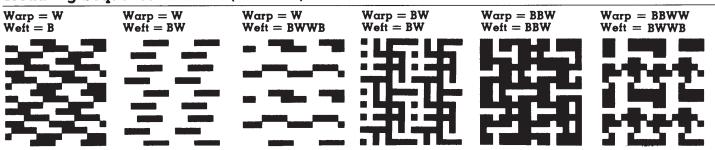


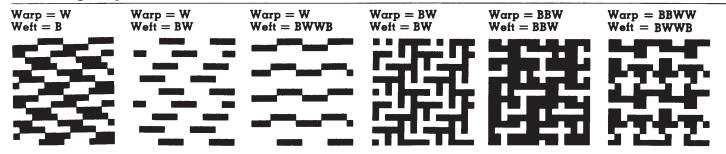
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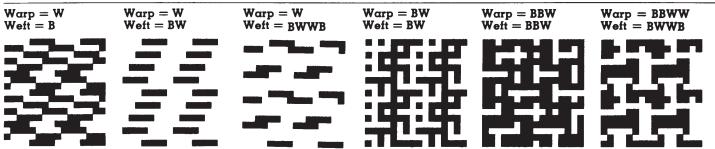


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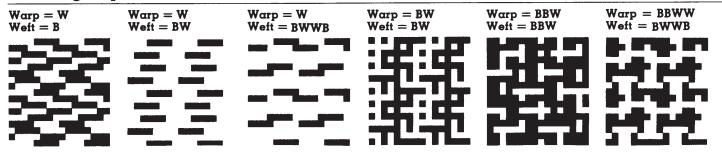


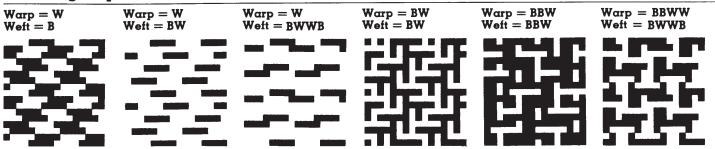


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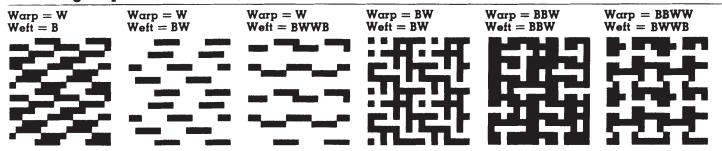


Treadling Sequence 12658374 (12743865)

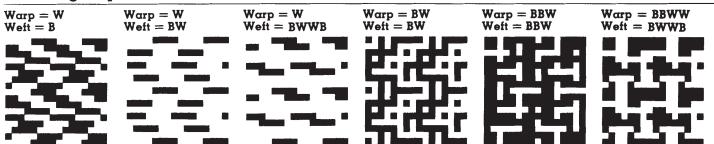




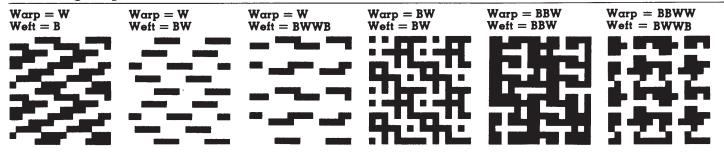
Treadling Sequence 12673584 (12674835)

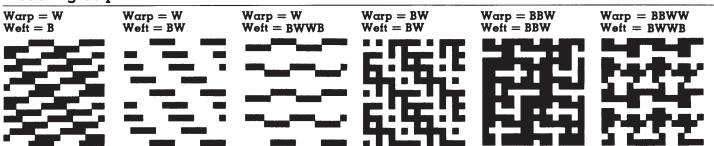


Treadling Sequence 12674853 (12675384)

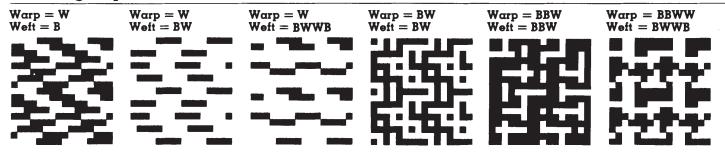


Treadling Sequence 12683574 (12746835)

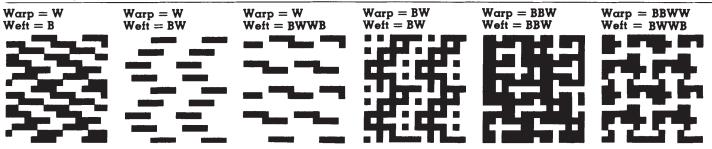




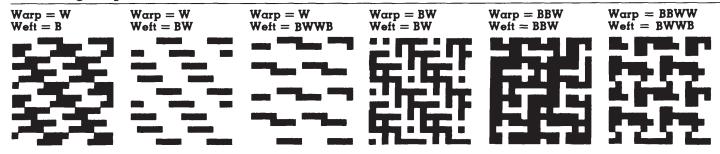
Treadling Sequence 12684753 (12864735)



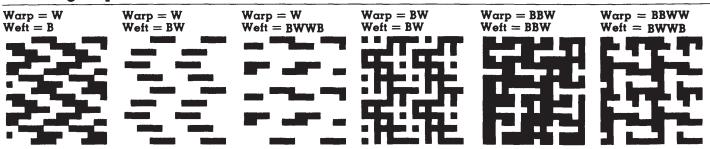
Treadling Sequence 12685374 (12748635)

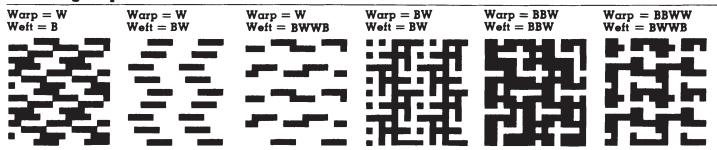


Treadling Sequence 12685734 (12685734)

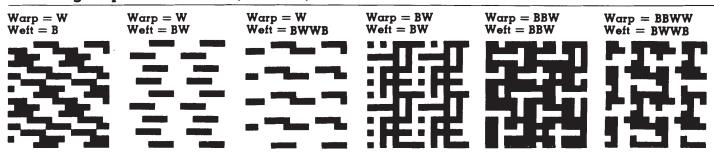


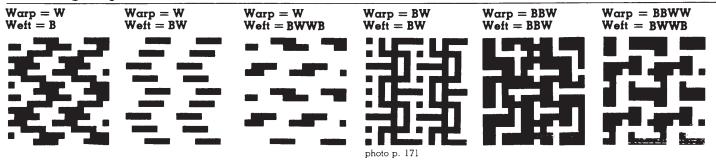
Treadling Sequence 12735864 (12753684)



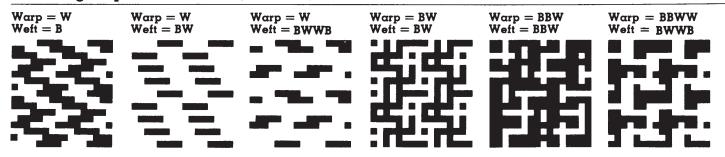


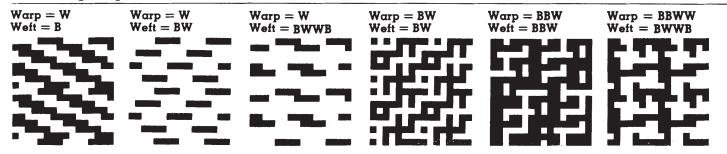
Treadling Sequence 12738564 (12748563)



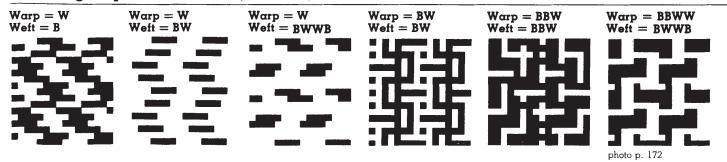


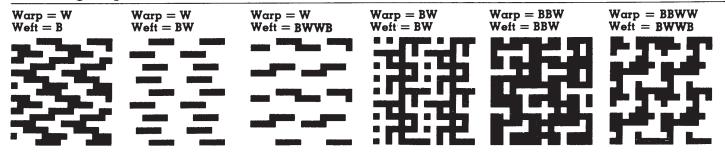
Treadling Sequence 12746853 (12863574)



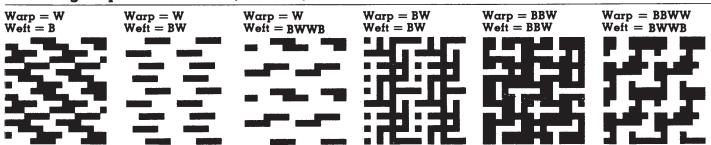


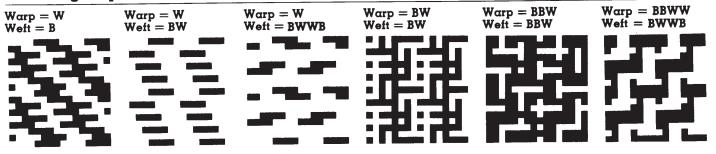
Treadling Sequence 12756483 (12837564)

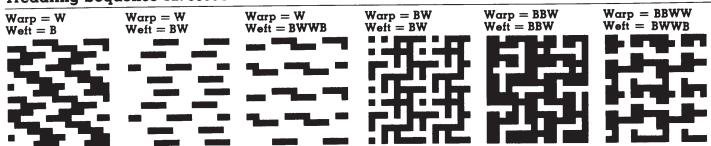


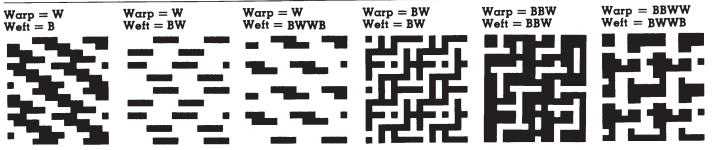


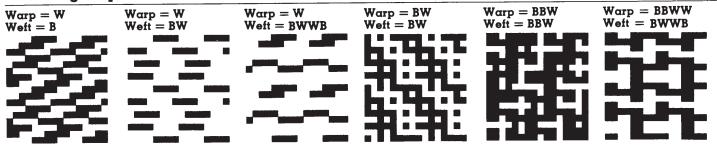
Treadling Sequence 12758463 (12857364)

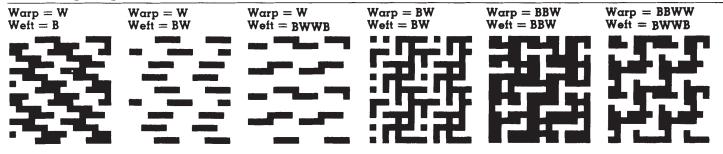


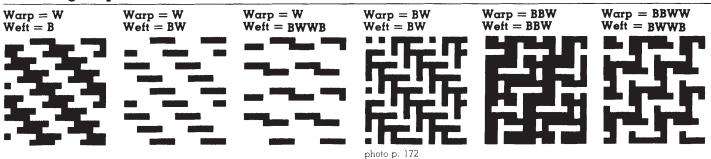


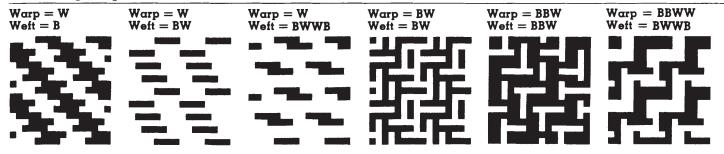




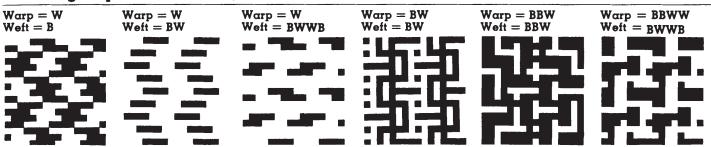




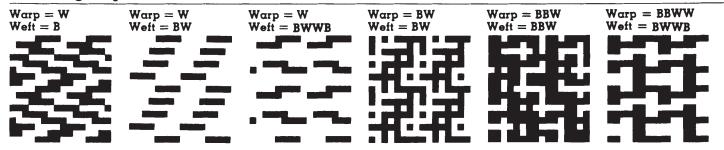


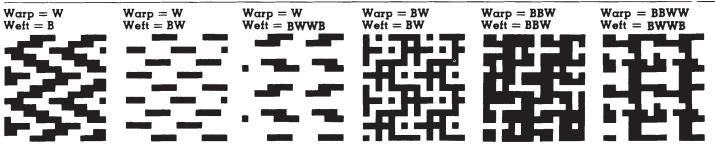


Treadling Sequence 13526847 (13576284)

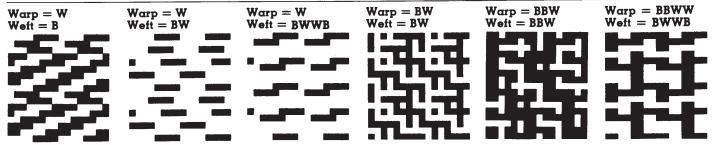


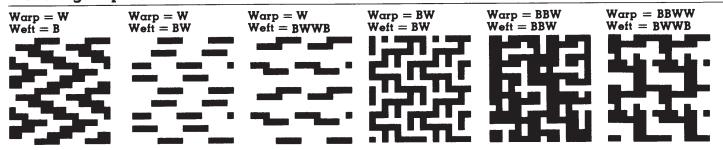
Treadling Sequence 13527486 (13586274)

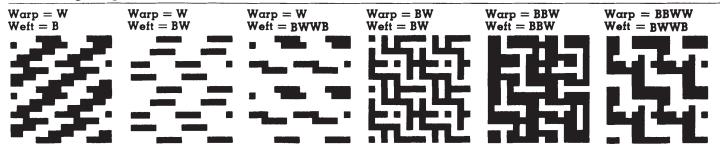


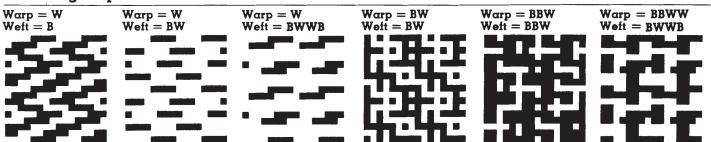


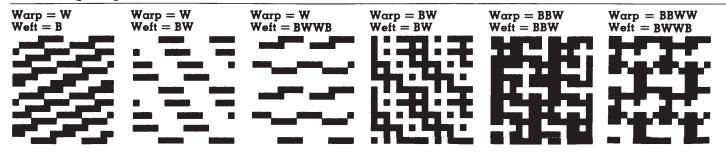
Treadling Sequence 13572486 (13572846)



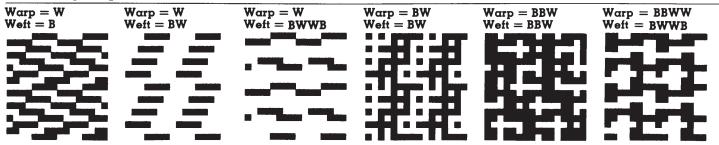




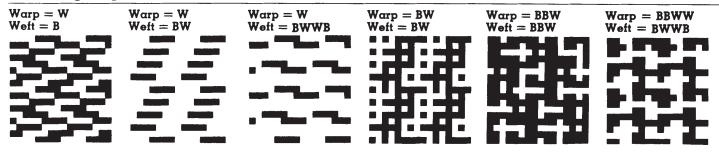


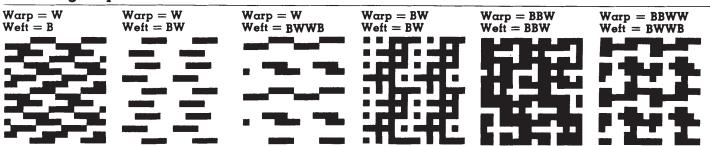


Treadling Sequence 13627485 (13748526)

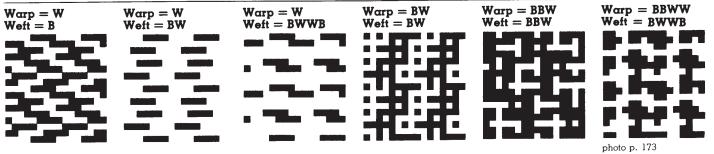


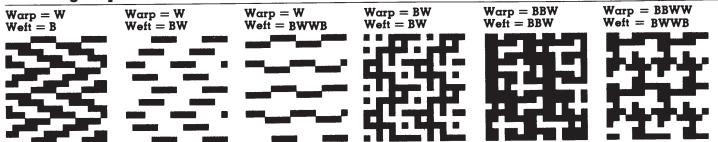
Treadling Sequence 13627584 (13847526)

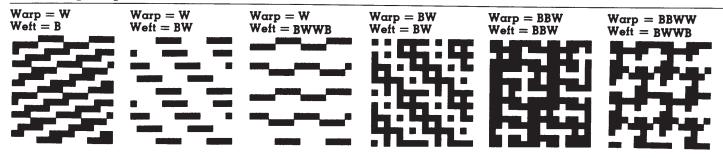


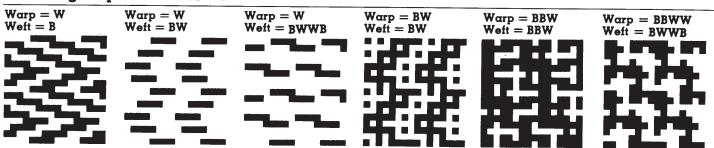


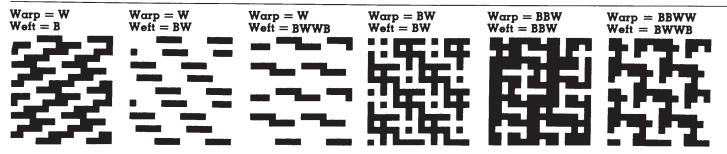
Treadling Sequence 13628574 (13647285)

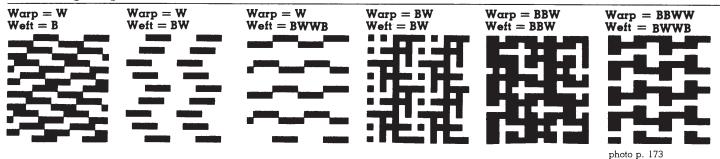


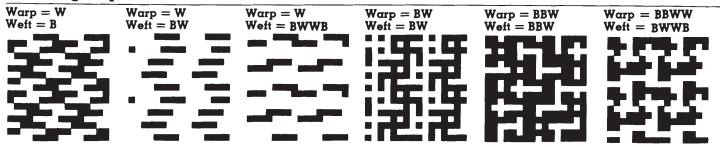


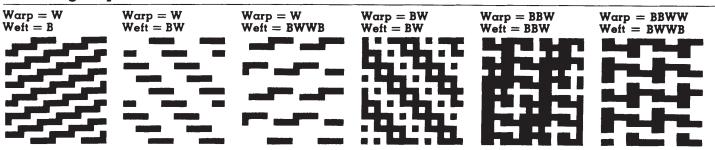


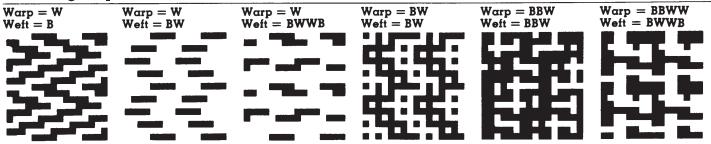


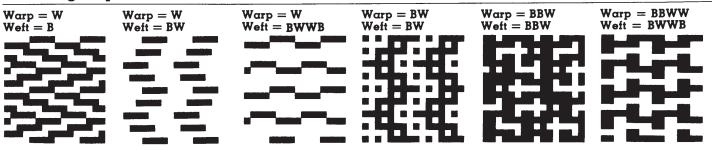












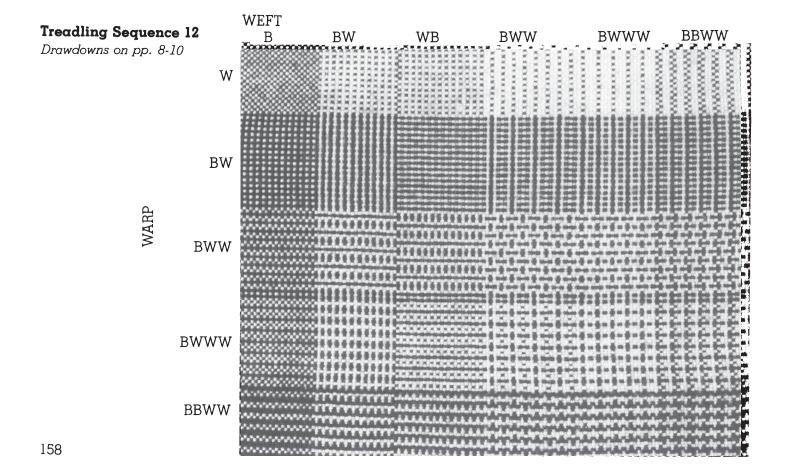
Photographs

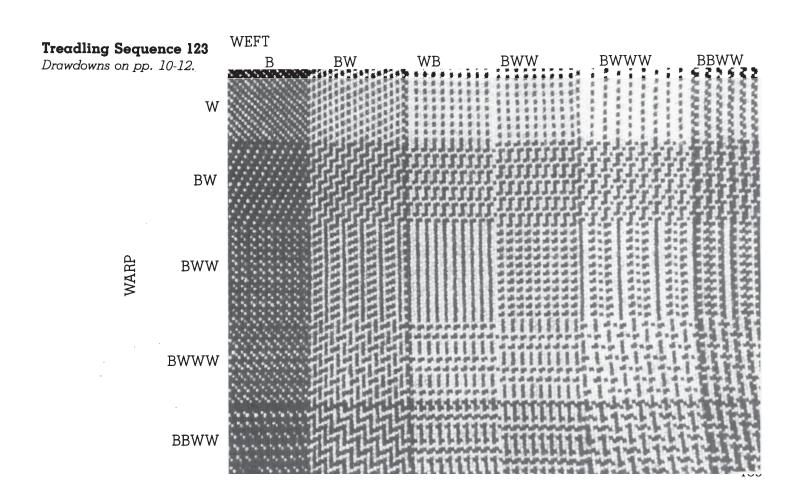
Following are woven swatches of some of the twills illustrated in the previous sections.

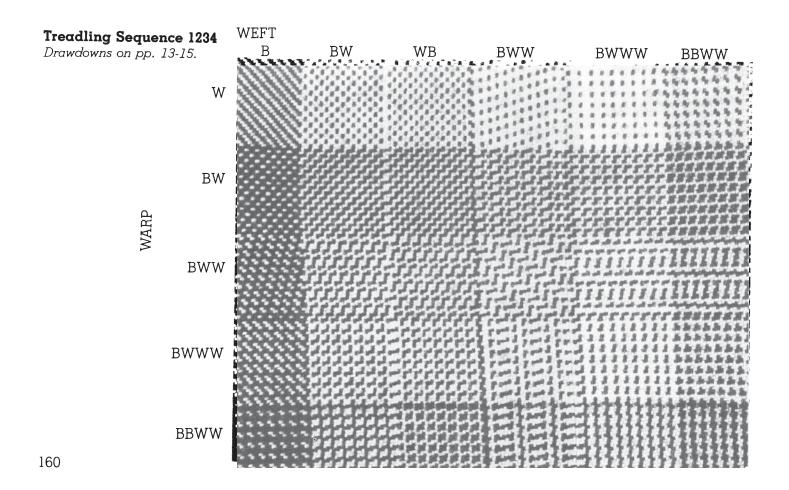
All are woven in black and white 3/12 wool.

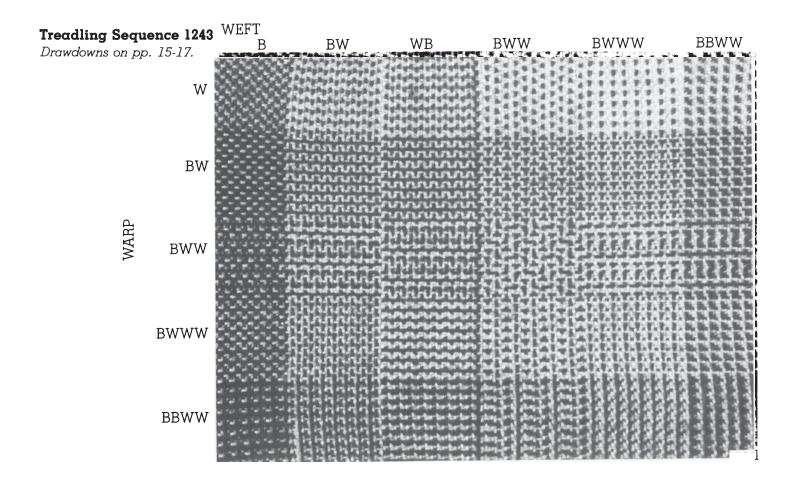
The 2, 3 and 4 harness samplers have been photographically reduced to 75% of the original swatch; 5, 6, 7 and 8 harness samples are shown full size.

Each sample is referenced to its drawdown to help you judge how a pattern will look actually woven.



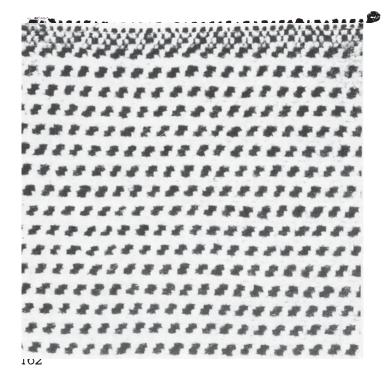


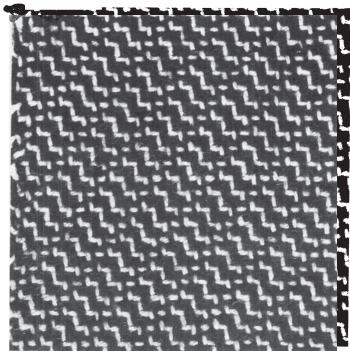




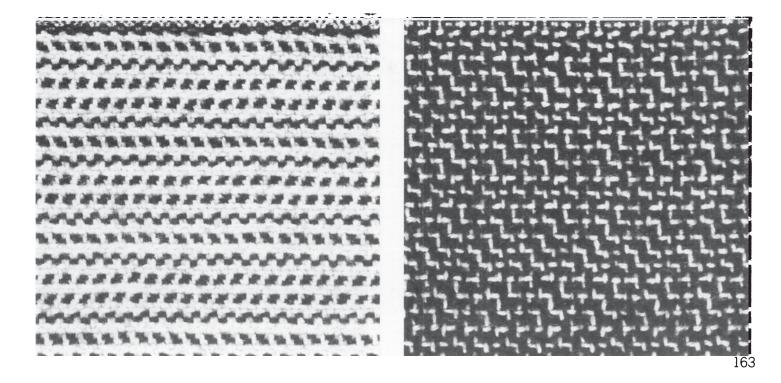
Five Harness Treadling Sequence 12345 Warp = W Weft = BBWW (see drawdown p. 20)

Five Harness Treadling Sequence 12345 Warp = BBW Weft = BBW (see drawdown p. 20)

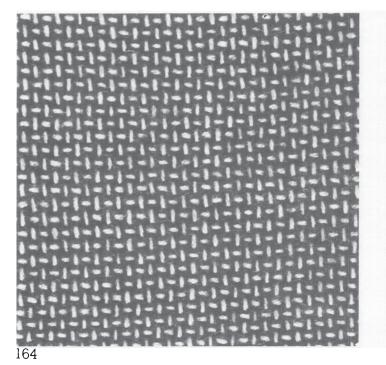


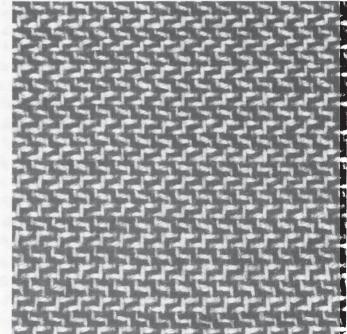


Five Harness Treadling Sequence 12354 Warp = W Weft = BBWW (see drawdown p. 20) Five Harness Treadling Sequence 12354 Warp = BBW Weft = BBW (see drawdown p. 20)

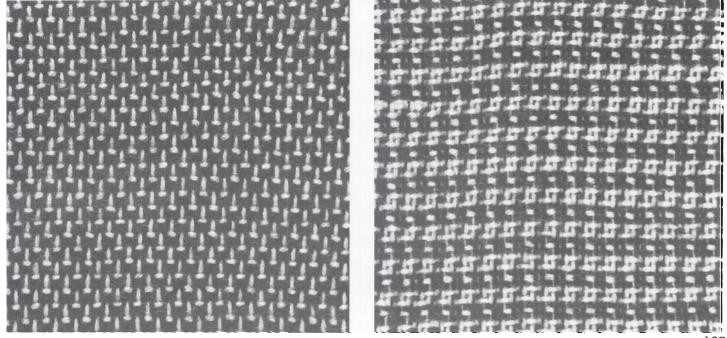


Six Harness Treadling Sequence 123456 Warp = BBW Weft = BBW (see drawdown p. 22) Six Harness Treadling Sequence 123654 Warp = BW Weft = BW (see drawdown p. 24)

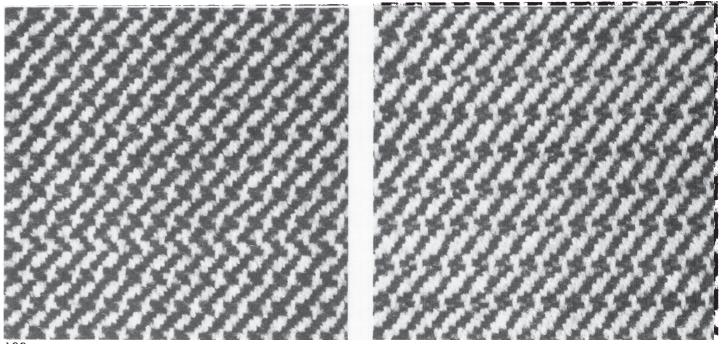




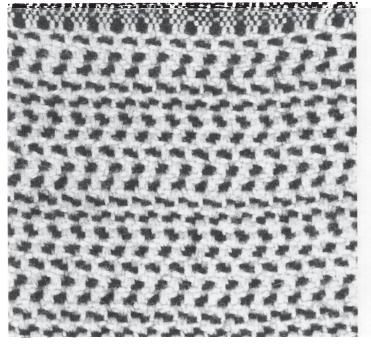
Six Harness Treadling Sequence 124653 Warp = BBW Weft = BBW (see drawdown p. 25) Six Harness Treadling Sequence 135264 Warp = BW Weft = BW (see drawdown p. 28)

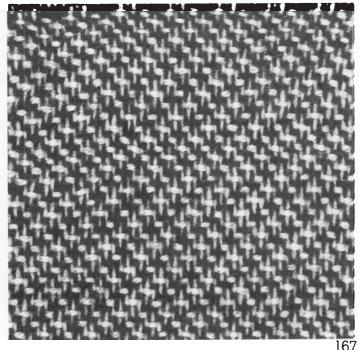


Seven Harness Treadling Sequence 1234765 Warp = W Weft = B (see drawdown p. 31) Seven Harness Treadling Sequence 1235746 Warp = W Weft = B (see drawdown p. 32)



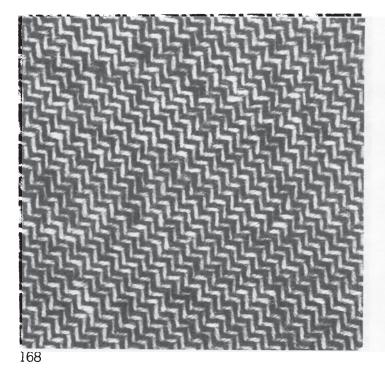
Seven Harness Treadling Sequence 1236754 Warp = W Weft = BBWW (see drawdown p. 35) Seven Harness Treadling Sequence 1357246 Warp = BBW Weft = BBW (see drawdown p. 53)

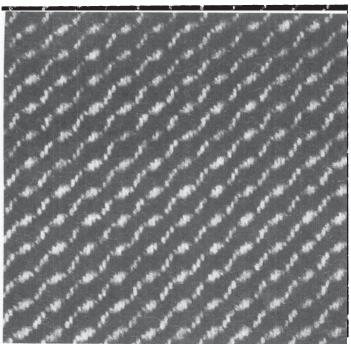




Eight Harness Treadling Sequence 12345678 Warp = BW Weft = BW (see drawdown p. 56)

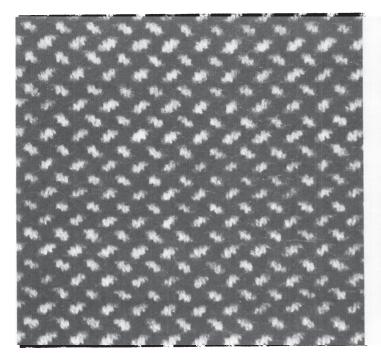
Eight Harness Treadling Sequence 12347586 Warp = W Weft = B (see drawdown p. 60)

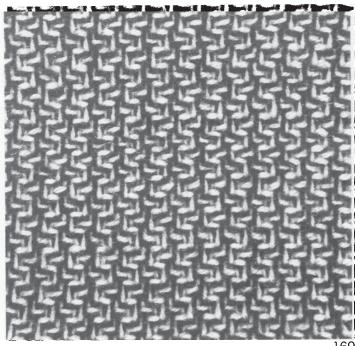




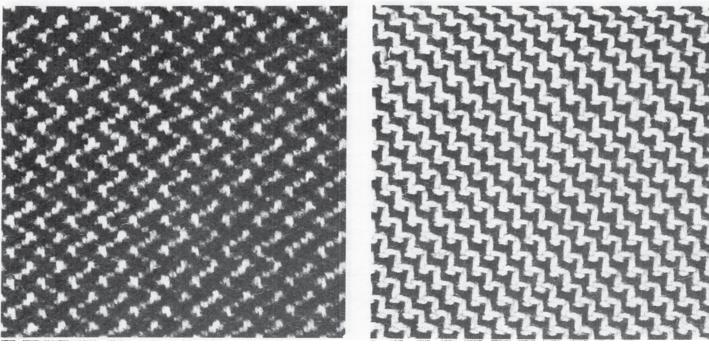
Eight Harness Treadling Sequence 12348765 Warp = W Weft = B (see drawdown p. 62)

Eight Harness Treadling Sequence 12358764 Warp = BW Weft = BW (see drawdown p. 70)



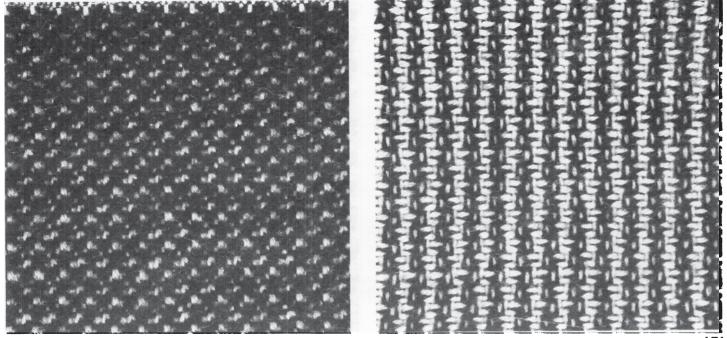


Eight Harness Treadling Sequence 12468753 Warp = W Weft = B (see drawdown p. 97) Eight Harness Treadling Sequence 12475683 Warp = BBWW Weft = BBWW (see drawdown p. 99)

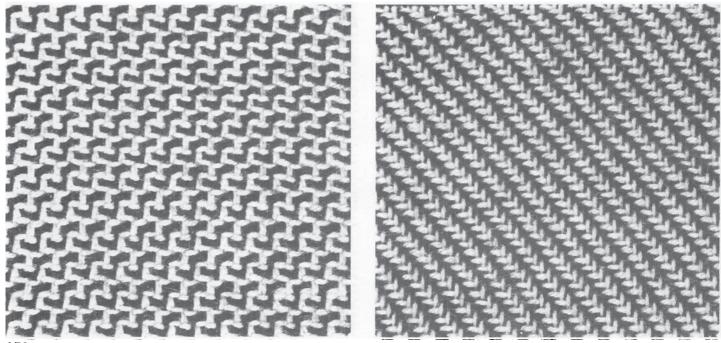


Eight Harness Treadling Sequence 12483675 Warp = W Weft = B (see drawdown p. 105)

Eight Harness Treadling Sequence 12746583 Warp = BW Weft = BW (see drawdown p. 139)



Eight Harness Treadling Sequence 12756483 Warp = BBWW Weft = BBWW (see drawdown p. 140) Eight Harness Treadling Sequence 12863574 Warp = BW Weft = BW (see drawdown p. 144)



Eight Harness Treadling Sequence 13628574 Warp = BBWW Weft = BBWW (see drawdown p. 151) Eight Harness Treadling Sequence 13726485 Warp = BBWW Weft = BBWW (see drawdown p. 153)

