

FIG. 624.

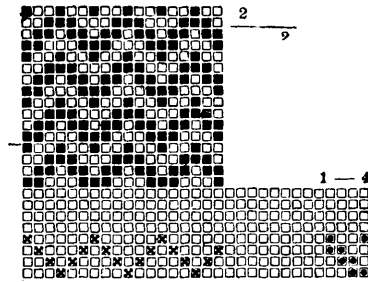


FIG. 625.

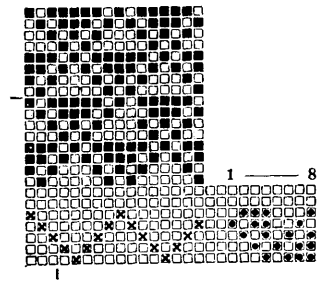
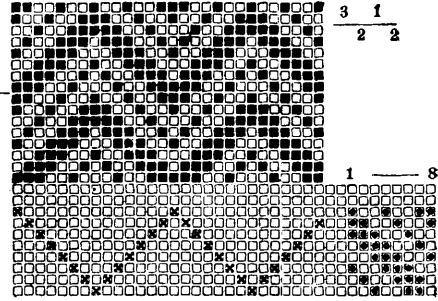


FIG. 626.

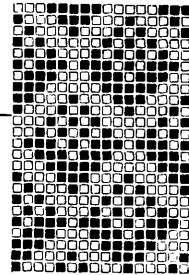


FIG. 627.

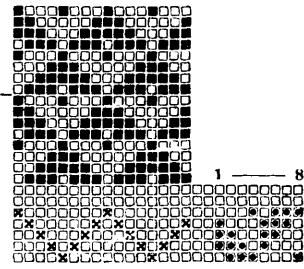


FIG. 628.

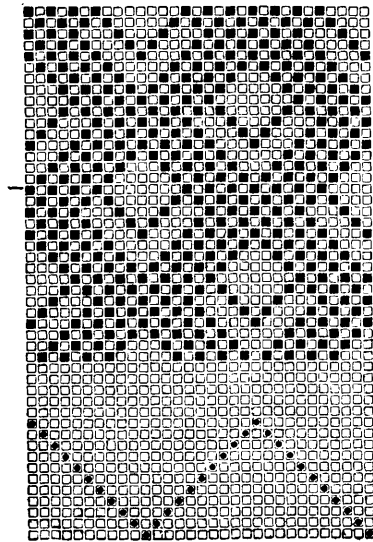


FIG. 629.

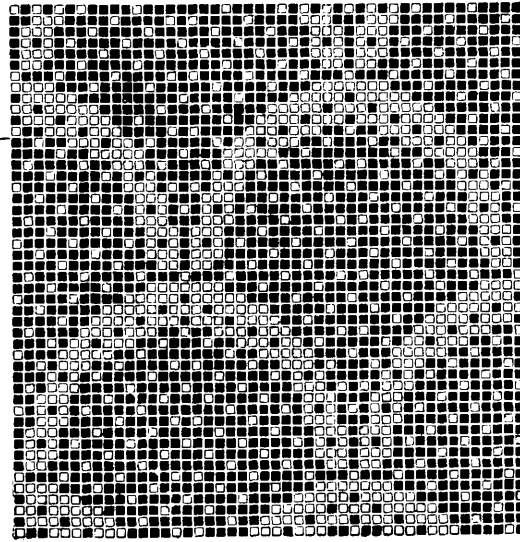


FIG. 630.

HERRINGBONE OR POINTED TWILLS

The true herringbone or pointed twill is one in which the twill at certain points slants in opposite directions from the float of one thread, as shown at Fig. 624.

$$\begin{array}{r} 2 \quad 1 \quad 1 \\ \hline 1 \quad 1 \quad 2 \end{array}$$

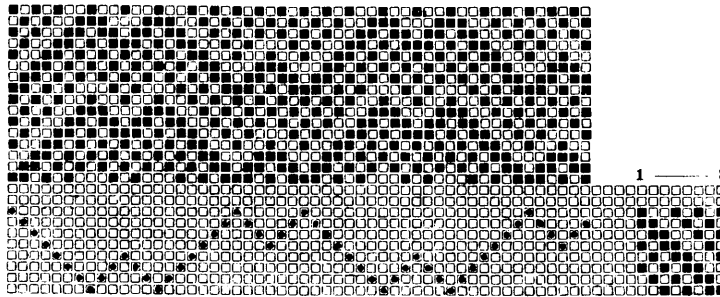
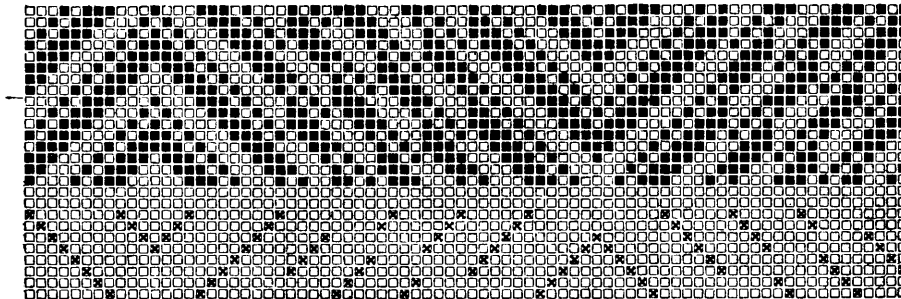


FIG. 631.

$$\begin{array}{r} 8 \quad 1 \\ \hline 1 \quad 3 \end{array}$$

FIG. 632.



$$\begin{array}{r} 3 \quad 1 \\ \hline 2 \quad 2 \end{array}$$

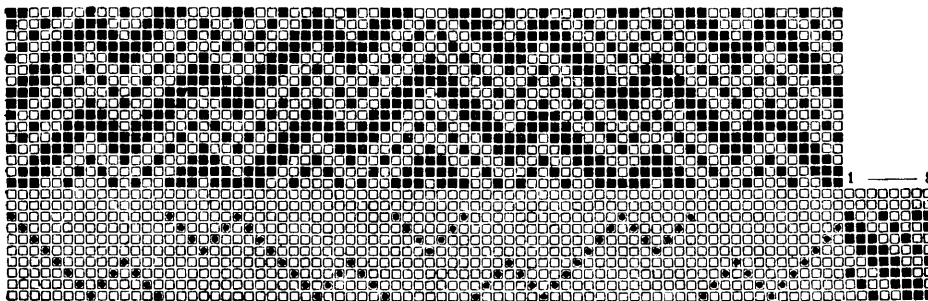


FIG. 633.

reversed, especially when the twill runs for a considerable distance before being reversed, Figs. 380 to 396.

The pointed herringbone effect is obtained with a twill chain and a pointed drawing-in draft, No. 3,

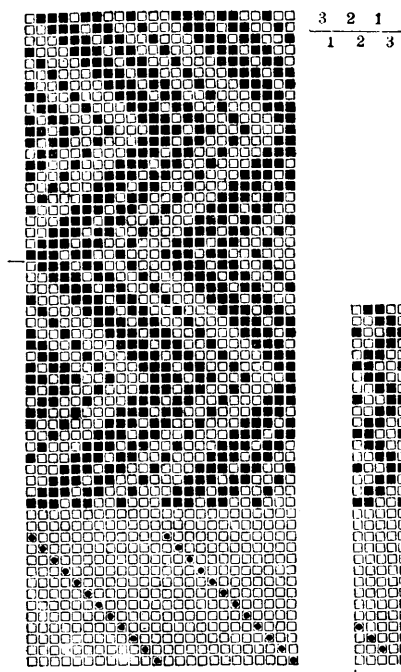


FIG. 637.

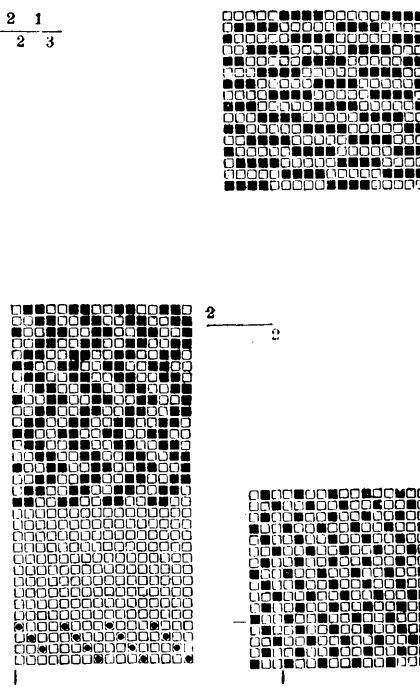


FIG. 636.

FIG. 638.

FIG. 639.

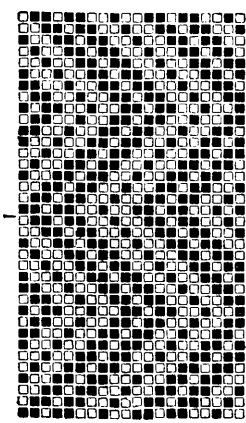


FIG. 640.

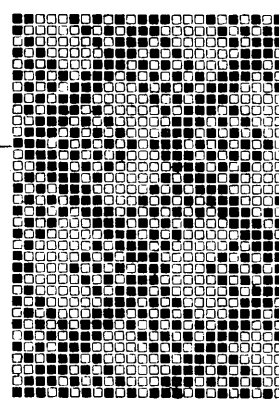


FIG. 641.

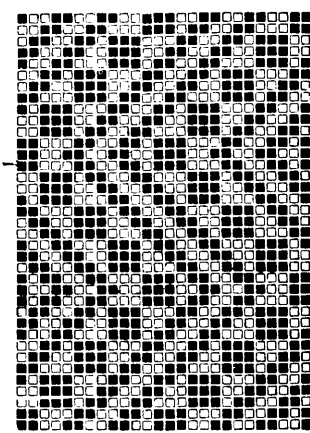


FIG. 642.

FIG. 643.

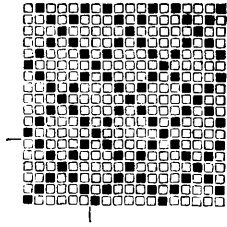


FIG. 644.

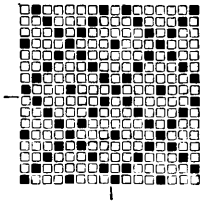


FIG. 645.

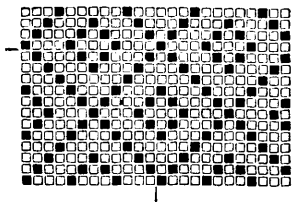
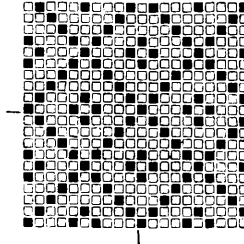


FIG. 646.

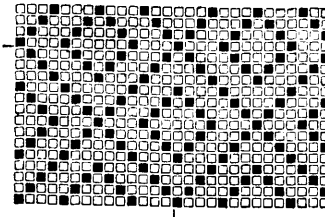


FIG. 647.

FIG. 648.

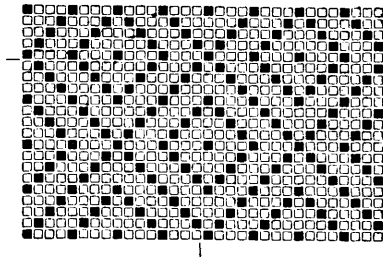


FIG. 649.

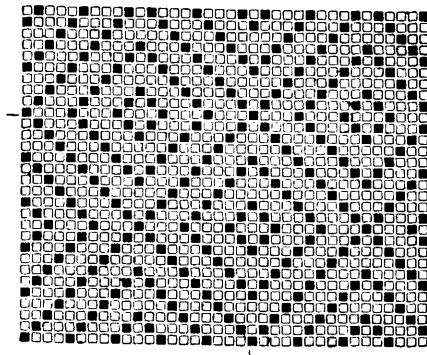
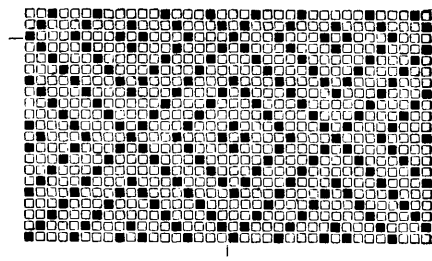


FIG. 650.

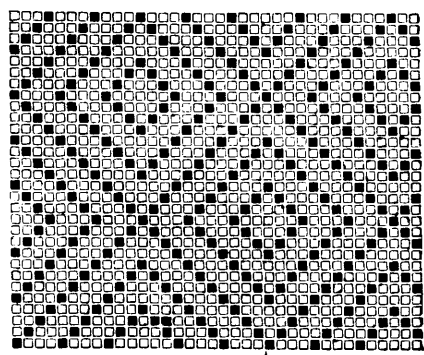


FIG. 651.

FIG. 652.

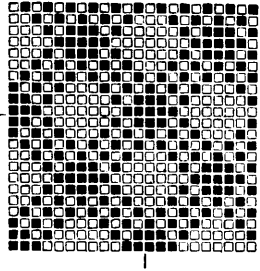


FIG. 653.

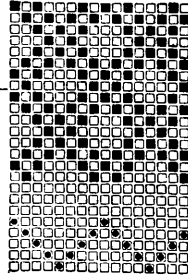


FIG. 654.

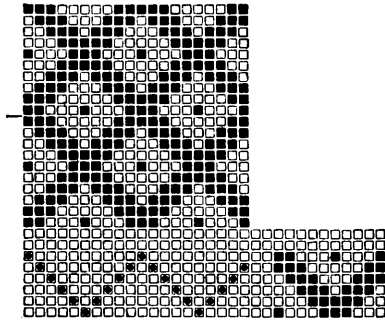
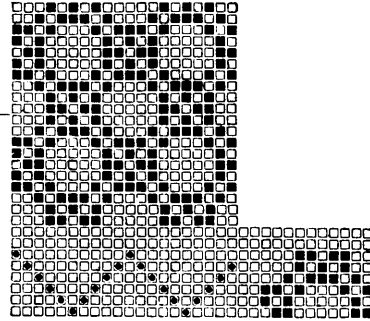


FIG. 655.

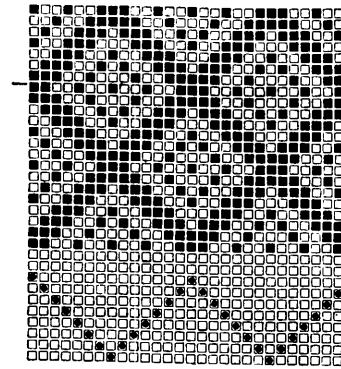


FIG. 656.

FIG. 657.

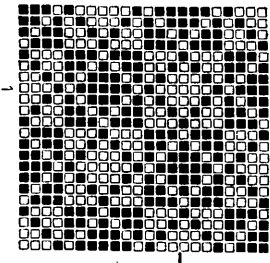


FIG. 658.

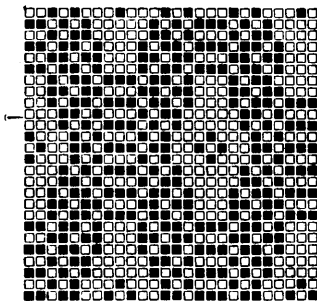
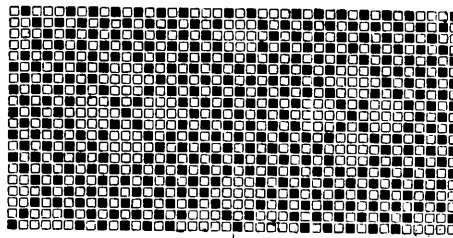


FIG. 659.

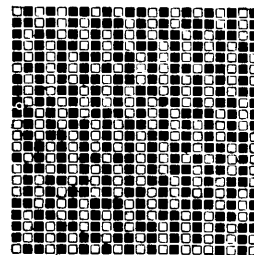


FIG. 660.

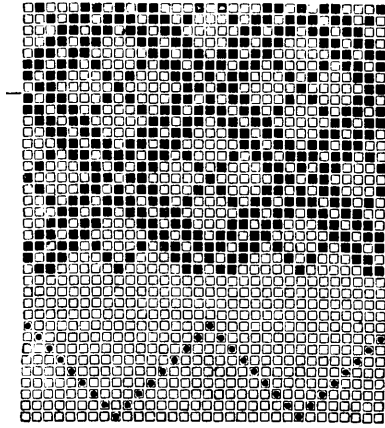


Fig. 661.

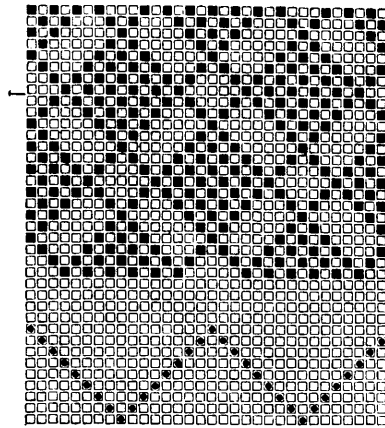


Fig. 662.

Figs. 9 and 10. The simplest form of this draft consists in drawing in straight from the first to the last shaft, then reversing and drawing in straight back to the first shaft, as shown at Fig. 624. This brings but half as many threads on the first and last shafts as on the others. Figs. 624 to 630 and Fig. 642 are examples of pointed or herringbone twills with this method of drawing-in.

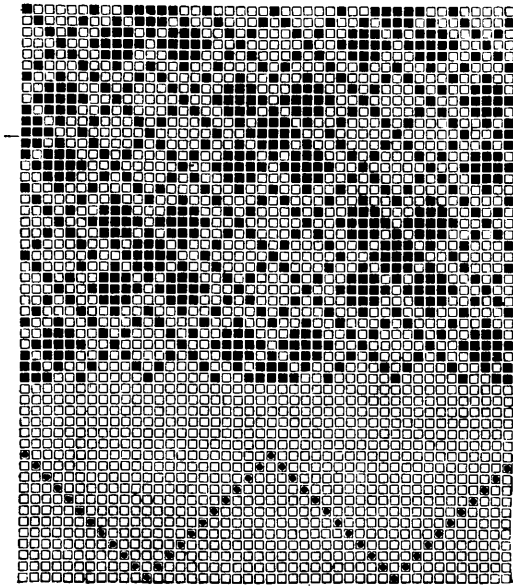


Fig. 663.

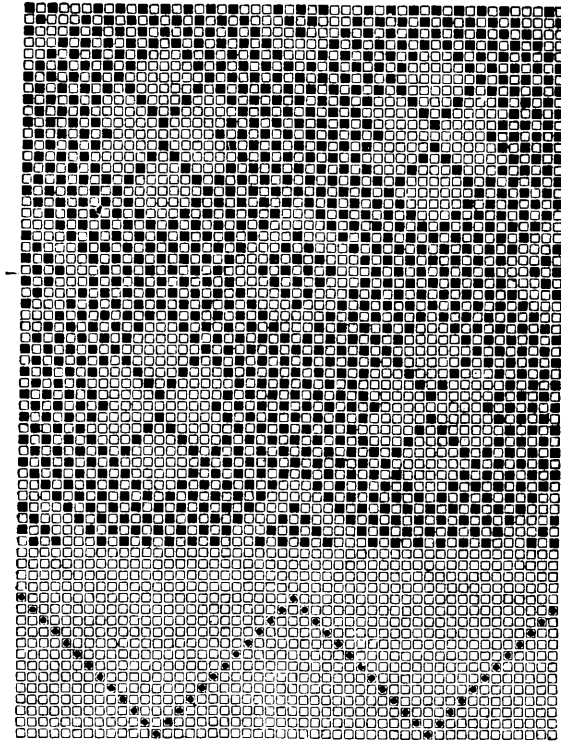


Fig. 664.

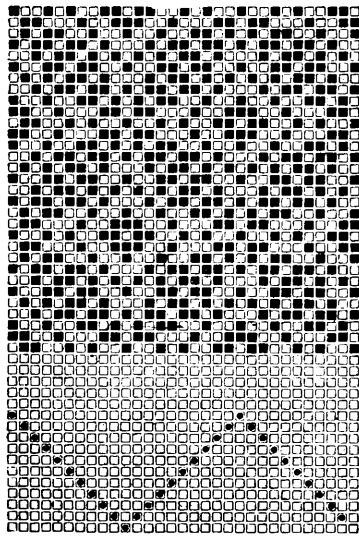


Fig. 665.

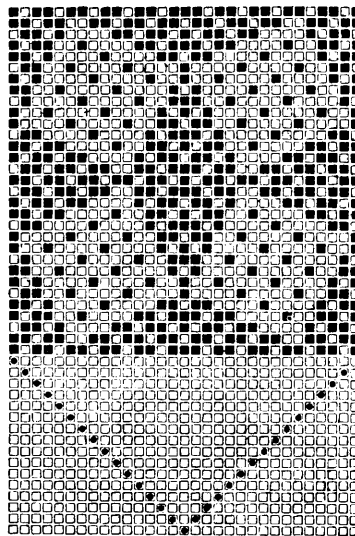


Fig. 666.

- Fig. 624, twill $^2-2$, 4-leaf.
- Fig. 625, twill $^3-2-1-2$, 8-leaf.
- Fig. 626, 5-leaf twill.
- Fig. 627, 6-leaf twill.
- Fig. 628, 5-leaf twill.
- Fig. 629, pattern 16 warp, 16 filling.
- Fig. 630, pattern 30 warp, 36 filling.
- Fig. 642, pattern 13 warp, 13 filling.

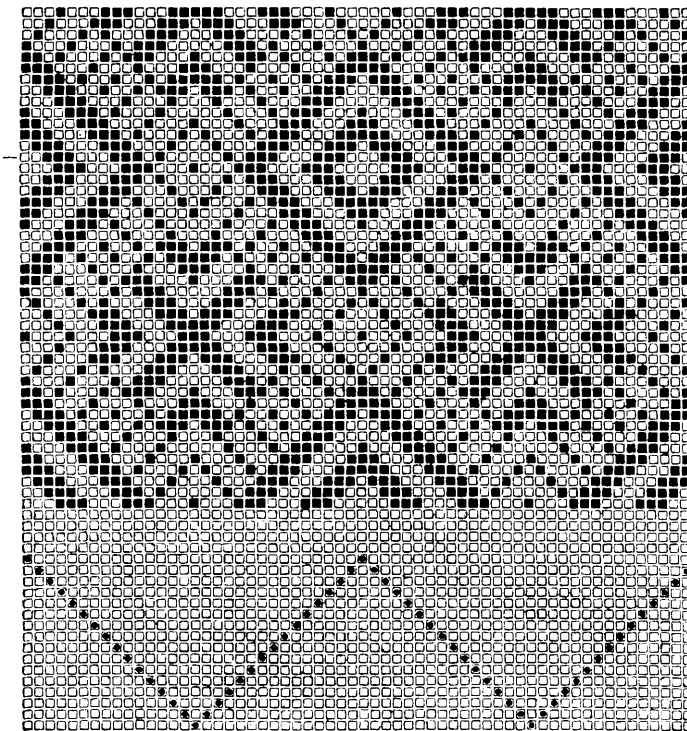


FIG. 667.

In the foregoing pointed-twill drafts the twill runs for the same distance each time before the direction is changed. A great variety of zigzag effects can be obtained by varying the distance over which the twill is carried continuously in the same direction. Several such patterns are shown at Figs. 631 to 635, the arrangement of the twill being shown in each case by the drawing-in draft.

Fig. 631, twill $^2_1-1-1-1-2$.

Fig. 632, twill $^3_1-1-3$.

Fig. 633, twill $^3_2-1-2$.

Fig. 634, twill $^3_1-3-1-1-3$.

Fig. 635, twill $^3_1-1-1-1-1-1-3-1-3$.

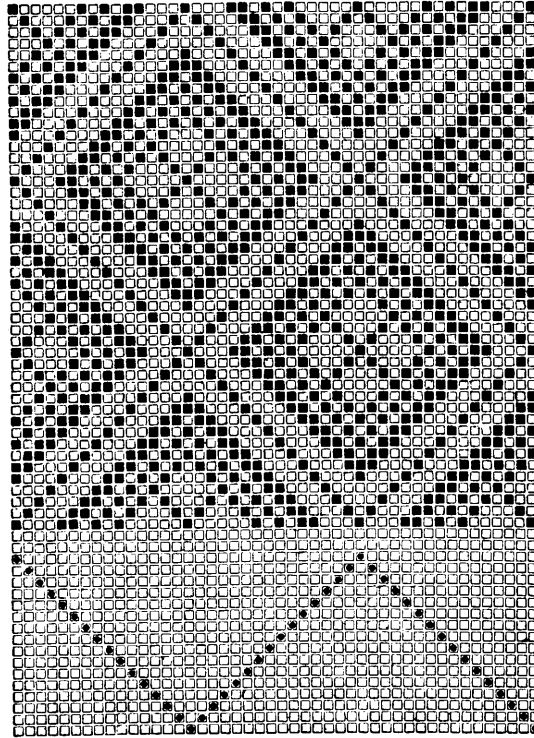


FIG. 668.

The twill in a herringbone weave can be arranged to bring the points at the side of the pattern, as shown at Fig. 638. For such weaves a straight drawing-in draft is used, the twill being reversed after a certain number of picks, as shown at Figs. 636 to 641.

Fig. 636, 9 warp, 16 filling.

Fig. 637, twill $^3_1-2-2-1-3$.

Fig. 638, twill 2_2 .

Fig. 639, twill 1_2 .

Fig. 640, twill $2-1-2-2-1-2$.

Fig. 641, 12 warp, 22 filling.

In Fig. 639 each third warp thread is woven plain, while the two intermediate threads are woven $1-3$. This makes the weave well suited for lightweight

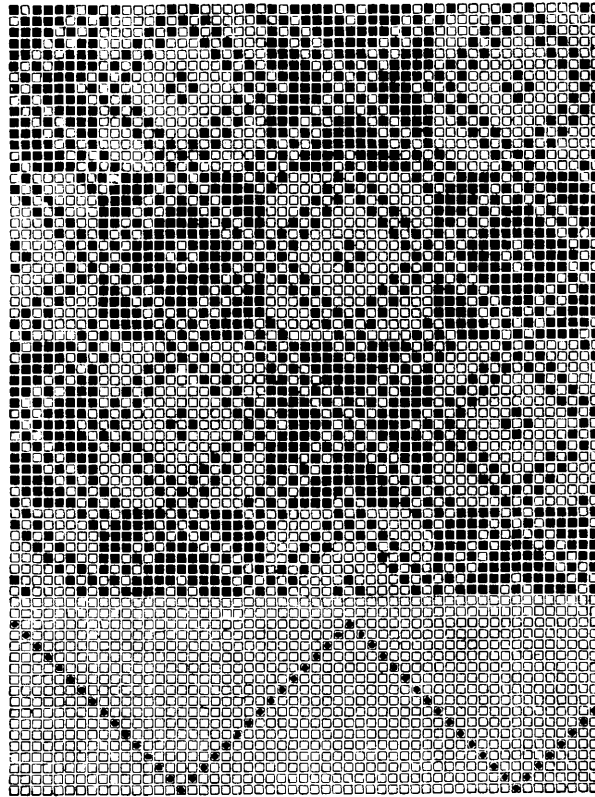


FIG. 669.

fancy cotton warp suitings. The pattern is arranged to bring all the fancy threads on the plain shafts. The cotton threads come on the $1-3$ shafts and also on the plain shafts when the pattern requires it. The filling, which is wool, floats on the face in $3-1$ order, covering the cotton warp.

TWILLS POINTED IN BOTH WARP AND FILLING

By reversing the twill at intervals in both warp and filling the lines intersect at four points, forming squares. The effects are most satisfactory when the diagonally opposite points are formed in the same way.

The patterns can be readily modified by increasing the number of threads from point to point in both

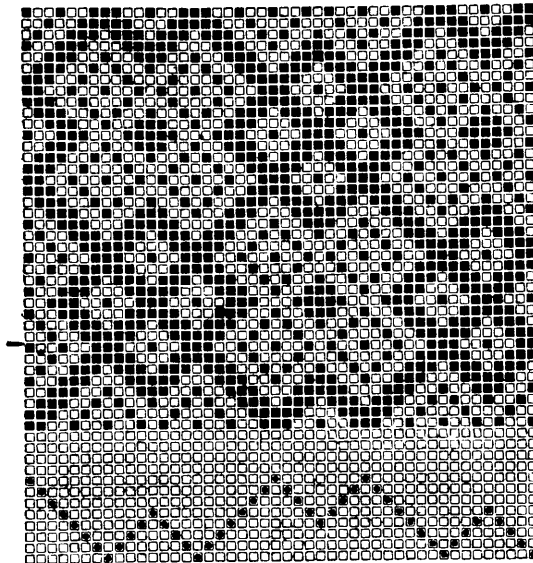


FIG. 670.

warp and filling. This is illustrated by Figs. 643 to 651. The twill, ¹—₃, is the same in all of these patterns, but each has one thread more from point to point than is found in the preceding one: Fig. 643, 4 threads; Fig. 644, 5 threads; Fig. 645, 6 threads; Fig. 646, 7 threads; Fig. 647, 8 threads; Fig. 648, 9 threads; Fig. 649, 10 threads; Fig. 650, 11 threads; Fig. 651, 12 threads.

The drawing-in drafts for these weaves are as follows:

- Fig. 643, 1, 2, 3, 4, 3, 2.
- Fig. 644, 1, 2, 3, 4, 1, 4, 3, 2.
- Fig. 645, 1, 2, 3, 4, 1, 2, 1, 4, 3, 2.
- Fig. 646, 1, 2, 3, 4, 1, 2, 3, 2, 1, 4, 3, 2.
- Fig. 647, 1, 2, 3, 4, 1, 2, 3, 4, 3, 2, 1, 4, 3, 2.
- Fig. 648, 1, 2, 3, 4, 1, 2, 3, 4, 1, 4, 3, 2, 1, 4, 3, 2.
- Fig. 649, 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 1, 4, 3, 2, 1, 4, 3, 2.
- Fig. 650, 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 2, 1, 4, 3, 2, 1, 4, 3, 2.
- Fig. 651, 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4, 3, 2, 1, 4, 3, 2, 1, 4, 3, 2.

The weave in each case is arranged in the filling to correspond with the drawing-in draft.

Figs. 652 to 671 show other examples of this style of twill patterns. The limits of the pattern are indicated on most of these figures by a short line at the side and bottom of the draft.

The pattern is developed by reversing the weave in the filling to correspond with the drawing-in draft. Thus in Fig. 670 the picks should be arranged as follows to correspond with the warp pattern: 1 to 8, reverse to 4, forward to 8, reverse to 1, forward to 5, reverse to 2, total 30 picks.

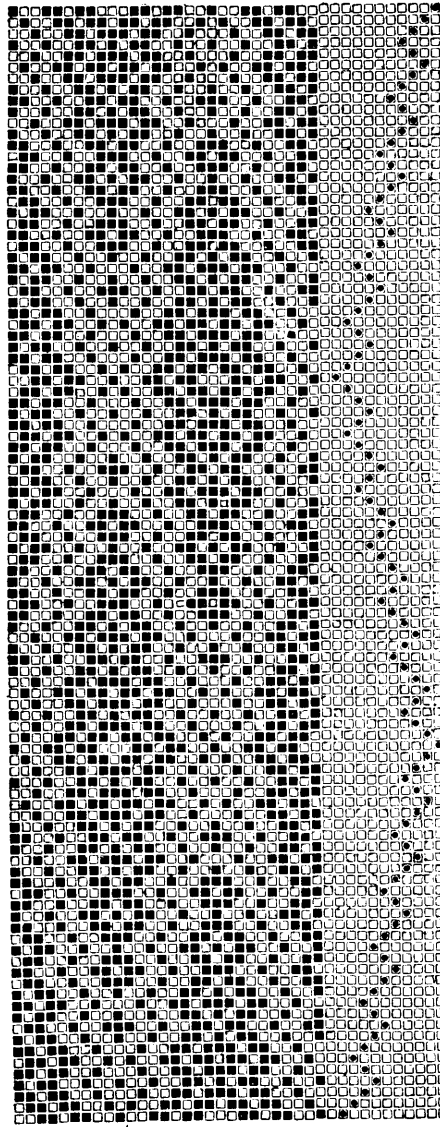


Fig. 671.

Fig. 671 is another pattern of this kind, requiring 10 shafts. The ground weave and drawing-in draft show the method of construction. The weave draft is made by arranging the filling to correspond with the pattern.

Pointed-twill patterns have the general defect that the float at the apex

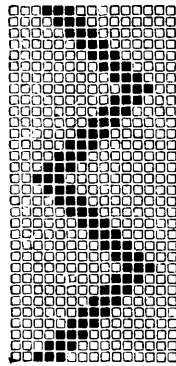


FIG. 672.

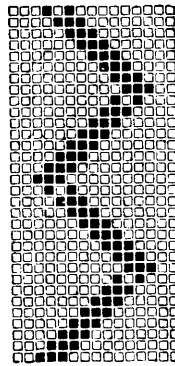


FIG. 673.

is nearly double that of the other floats. When it is important to have the size of the floats practically uniform, the longer floats at the points are broken up by the insertion or removal of risers. This is illustrated at Figs. 672 and 673. Fig. 672 is

a pointed twill reversed filling ways. At the point is found a float of five risers, while the regular float of the twill is but three risers. Fig. 673 shows the same draft in which the float of five at the point has been broken up by the removal of one riser. This causes an increase in the number of shafts required for the weave.

DIVERSIFIED WEAVES

Very attractive patterns can be obtained by adding or removing risers from a ground weave. These alterations are made according to a previously selected motif. Examples are shown at Figs. 674 to 740.

FIG. 674.

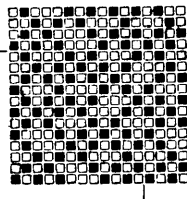


FIG. 675.

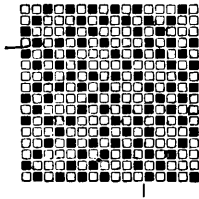


FIG. 676.

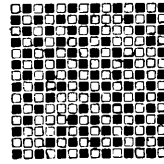


FIG. 677.

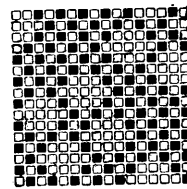
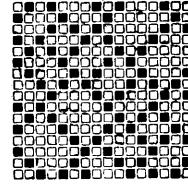


FIG. 678.

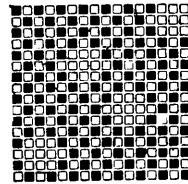


FIG. 679.

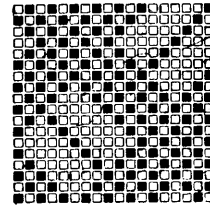


FIG. 680.

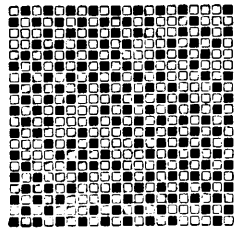


FIG. 681.

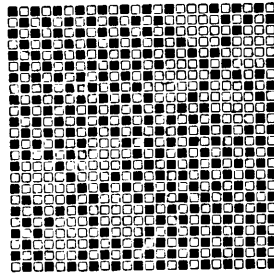


FIG. 682.

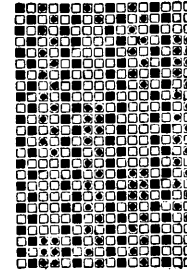


FIG. 683.

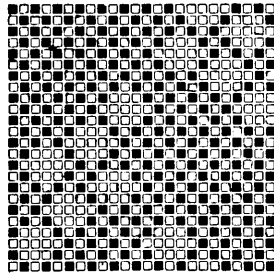


FIG. 684.

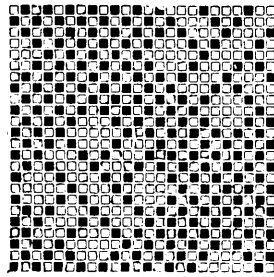


FIG. 685.

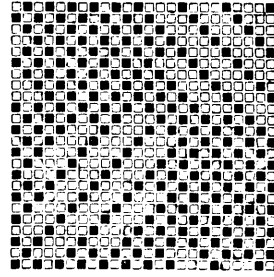


FIG. 686.

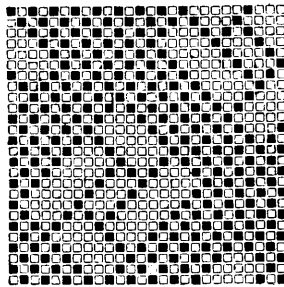


FIG. 687.

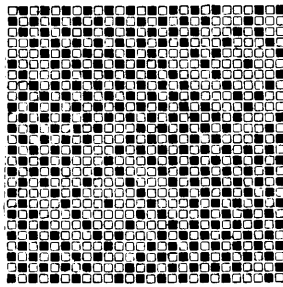


FIG. 688.

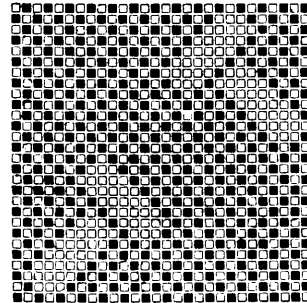


FIG. 689.

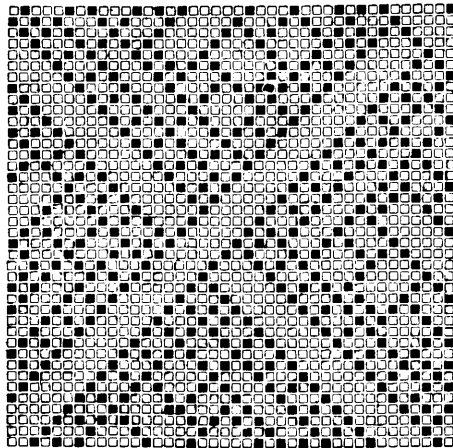


FIG. 690.

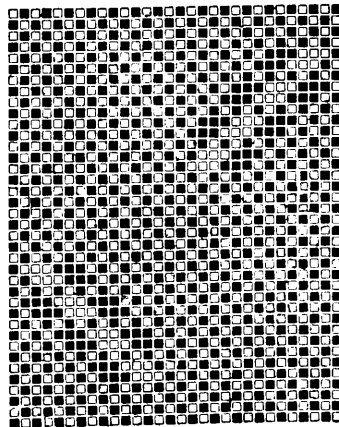


FIG. 691.

DIVERSIFIED PLAIN WEAVES

In Figs. 674 to 693 the ground is a plain weave. Fig. 683 is adapted for a cloth dressed 2 worsted, 2 silk.

In Figs. 683, 691 and 693 points are both added and removed to develop the design. In drafting these

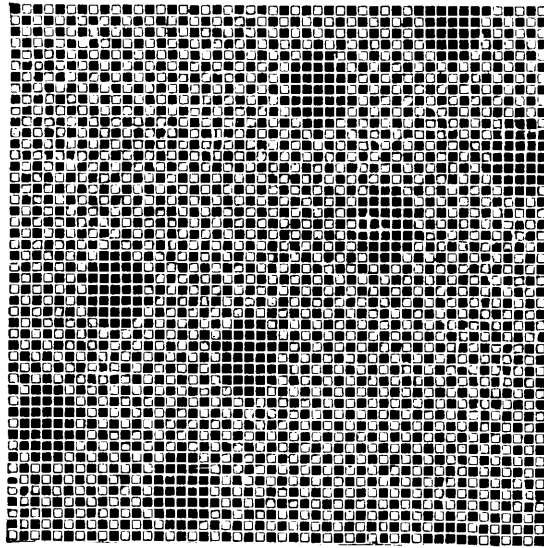


FIG. 692.

weaves the motif is first painted on the draft and the ground weave and floats are then inserted to correspond.

DIVERSIFIED TWILLS

Figs. 694 to 722 show effects obtained on twill weaves by adding or removing risers. Fig. 710 is the motif for Fig. 709, the black squares in this draft representing sinkers, the white squares risers; Fig. 712, the motif for Figs. 714 and 715; Fig. 716, the motif for Fig. 718.

The spotting in several of the other designs is arranged as follows: Figs. 708, 711, 713, 8-leaf satin; Figs. 717, 719 and 722, 5-leaf satin.

DIVERSIFIED SATIN WEAVES

Weave designs formed on a satin ground are shown at Figs. 723 to 729.

Fig. 694	15 × 15
Fig. 695	12 × 12
Fig. 696	15 × 15
Fig. 697	18 × 18
Fig. 698	18 × 18
Fig. 699	24 × 24

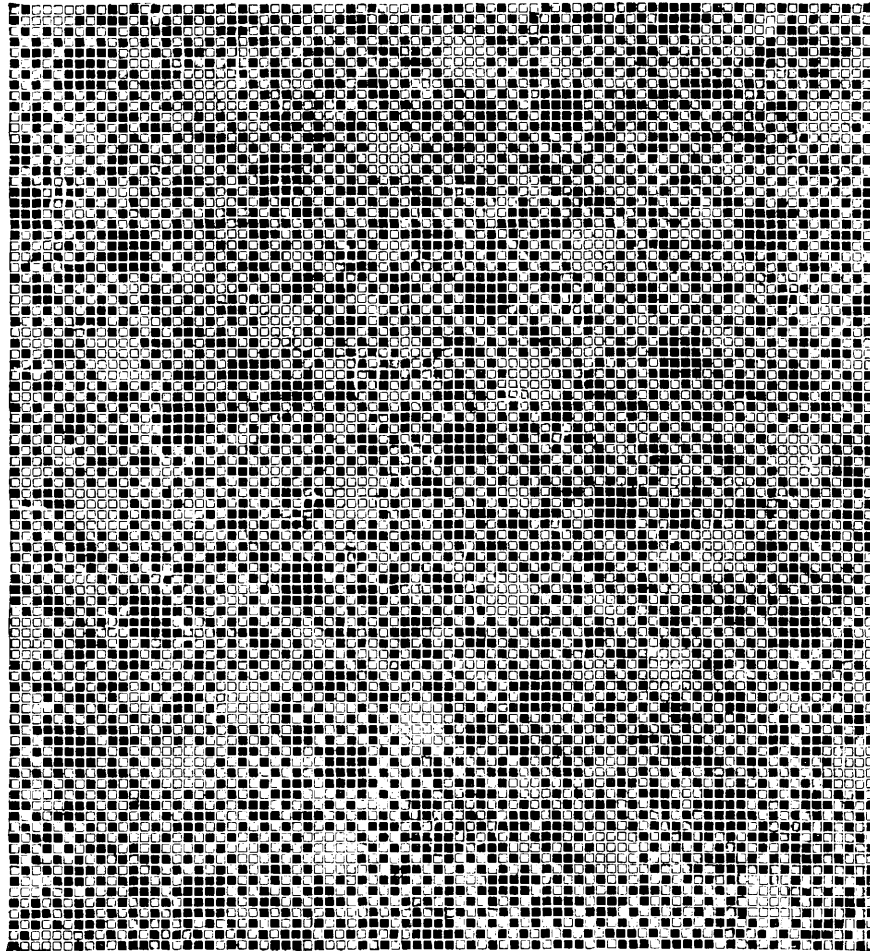


FIG. 693.

Fig. 700	16 × 16
Fig. 701	16 × 16
Fig. 702	16 × 16
Fig. 703	16 × 16
Fig. 704	16 × 16
Fig. 705	16 × 16

FIG. 694.

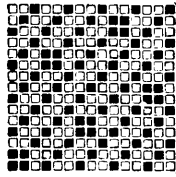


FIG. 695.

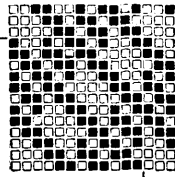


FIG. 696.

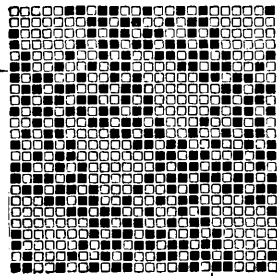
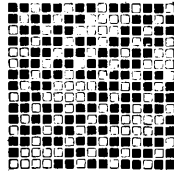


FIG. 697.

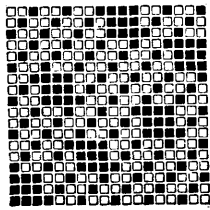


FIG. 698.

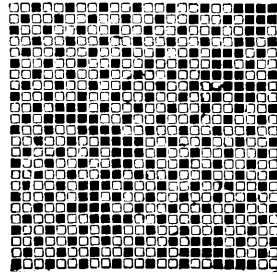


FIG. 699.

FIG. 700.

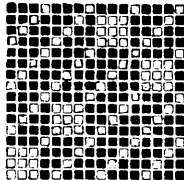


FIG. 701.

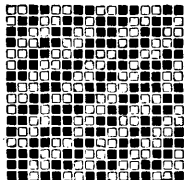


FIG. 702.

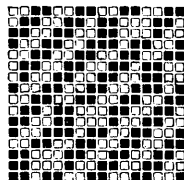


FIG. 703.

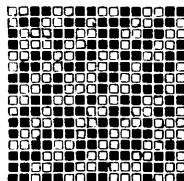
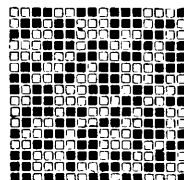


FIG. 704.

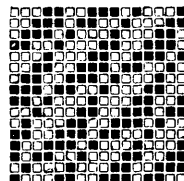


FIG. 705.

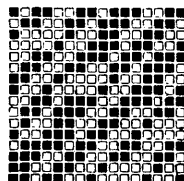


FIG. 706.

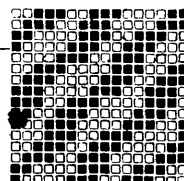


FIG. 707.

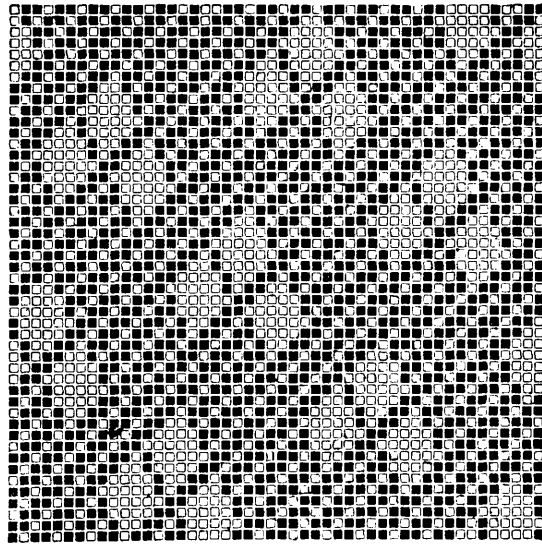


FIG. 708.

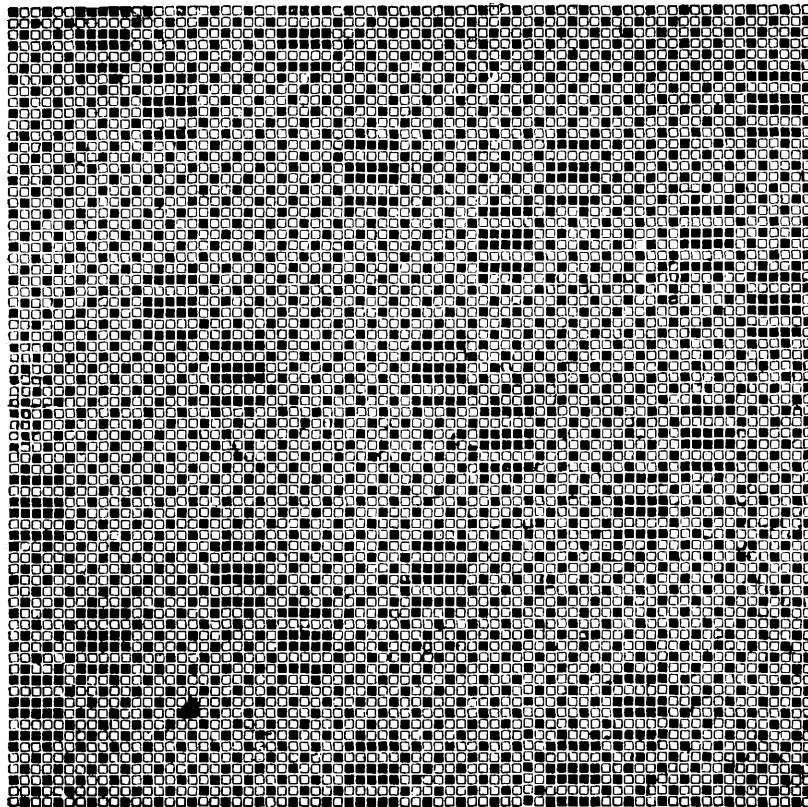


FIG. 709.

FIG. 710.

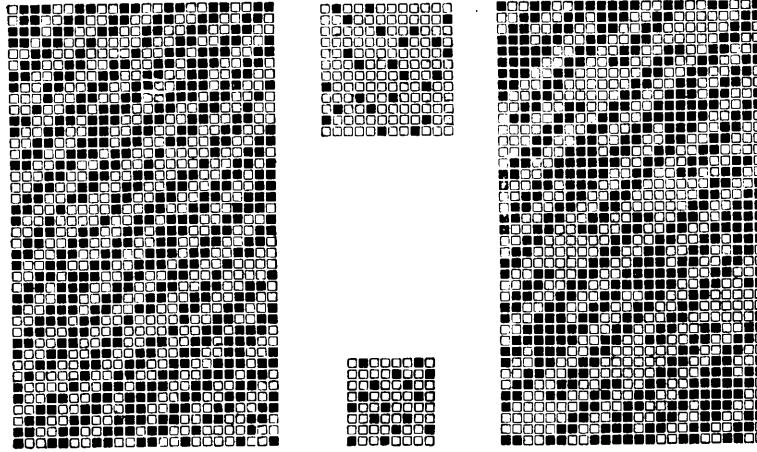


FIG. 711.

FIG. 712.

FIG. 713.

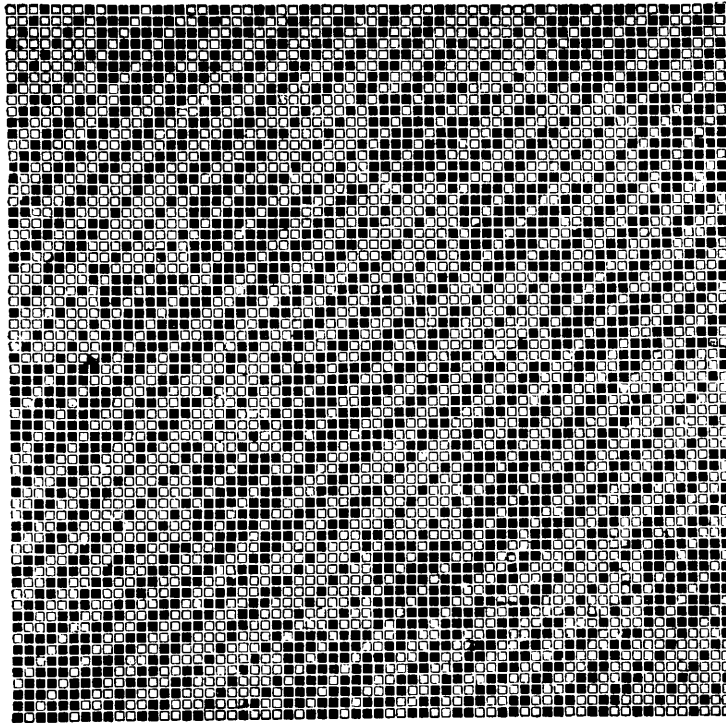


FIG. 714.

Fig. 706	16 × 16
Fig. 707	12 × 12
Fig. 708	48 × 48
Fig. 709	72 × 72
Fig. 711	24 × 40

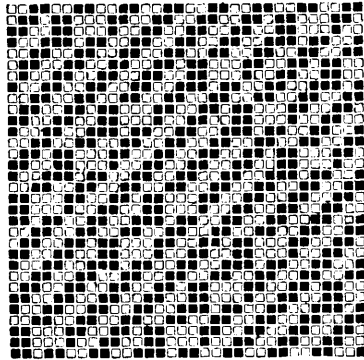


FIG. 715.

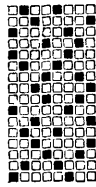


FIG. 716.

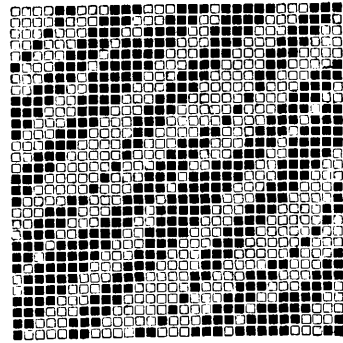


FIG. 717.

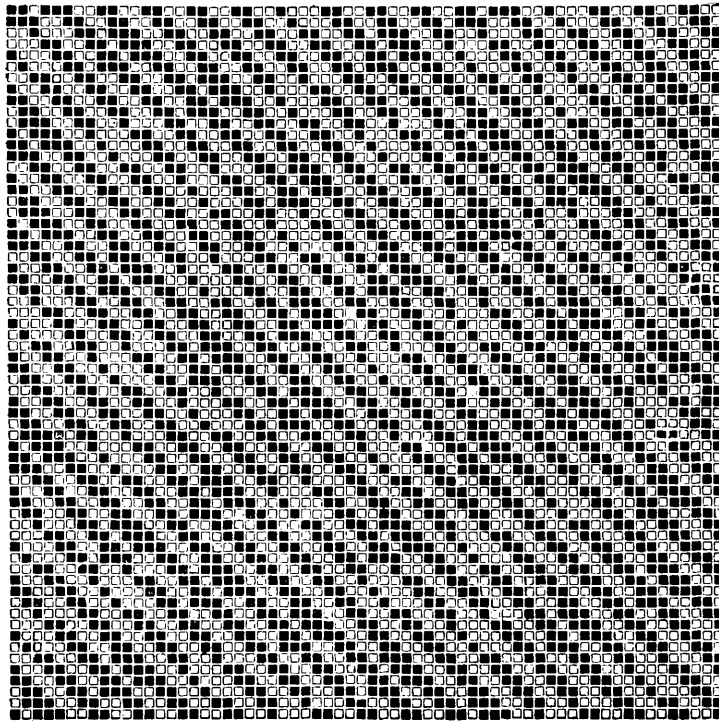


FIG. 718.

Fig. 713	24 × 40
Fig. 714	64 × 64
Fig. 715	32 × 32
Fig. 717	30 × 30
Fig. 718	64 × 64
Fig. 719	30 × 30

FIG. 719.

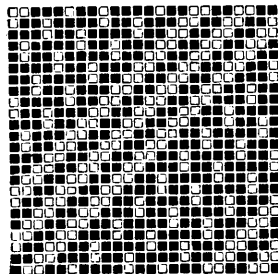
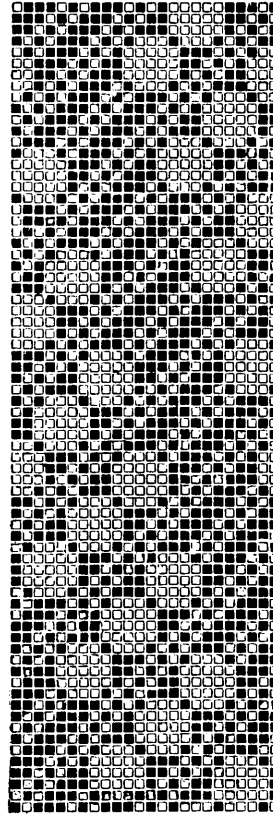
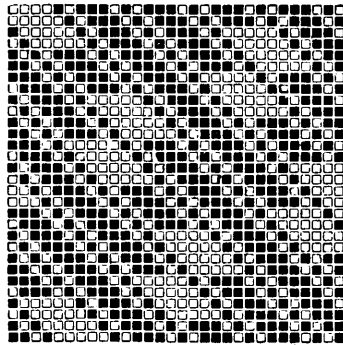


FIG. 721.

FIG. 720.

Fig. 720	24 × 72
Fig. 721	24 × 24
Fig. 722	60 × 60
Fig. 723	16 × 80
Fig. 724	16 × 16
Fig. 725	20 × 20
Fig. 726	12 × 12

Fig. 727	40 × 40
Fig. 728	40 × 40
Fig. 729	48 × 48

DIVERSIFIED RIB WEAVES

Very pleasing effects can be obtained by grouping floats on a diagonal rib weave, Figs. 730 to 740. Particularly suitable for such a groundwork is the 9-leaf weave shown at Fig. 731, from which are derived Figs. 734, 735, 737 and 738.

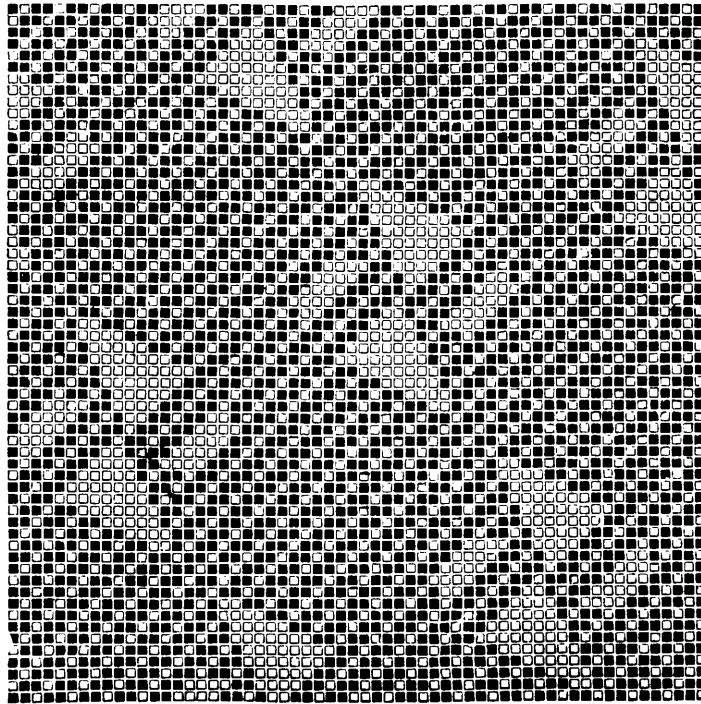


FIG. 722.

Fig. 730	18 × 18
Fig. 732	18 × 18
Fig. 733	24 × 60
Fig. 734	45 × 45
Fig. 735	54 × 27
Fig. 736	26 × 78

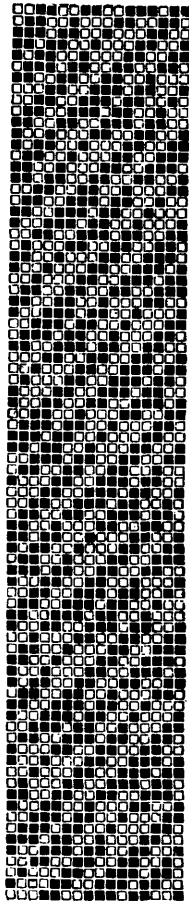


FIG. 723.

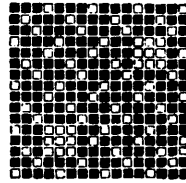


FIG. 724.

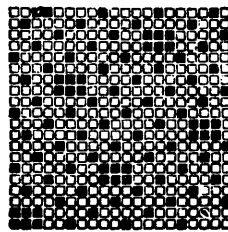


FIG. 725.

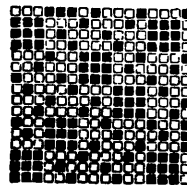


FIG. 726.

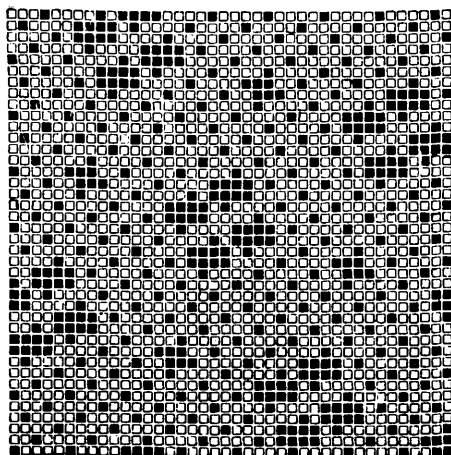


FIG. 727.

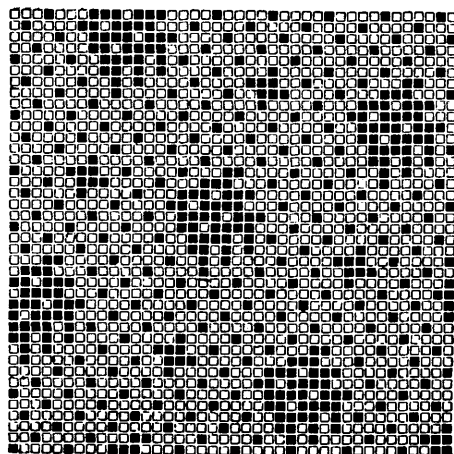


FIG. 728.

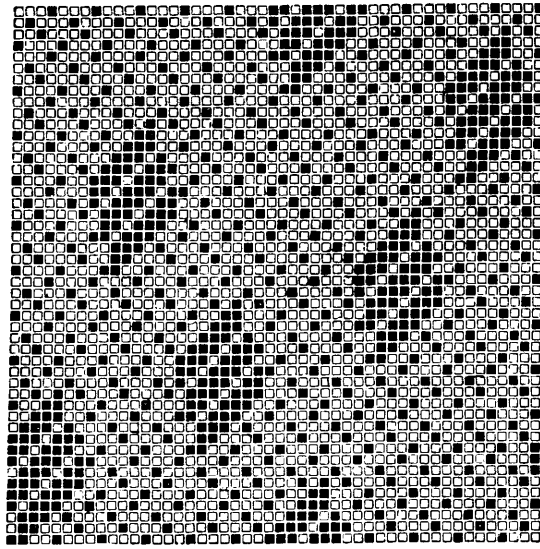


FIG. 729.

FIG. 730.

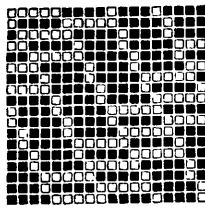


FIG. 731.

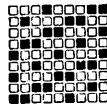


FIG. 732.

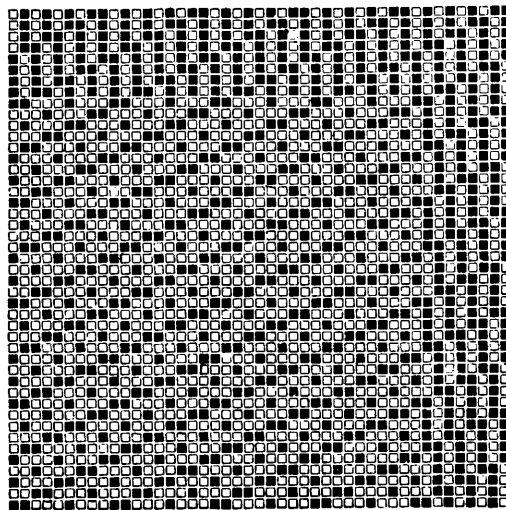
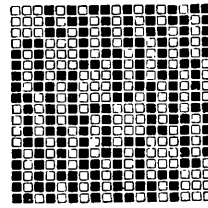


FIG. 734.

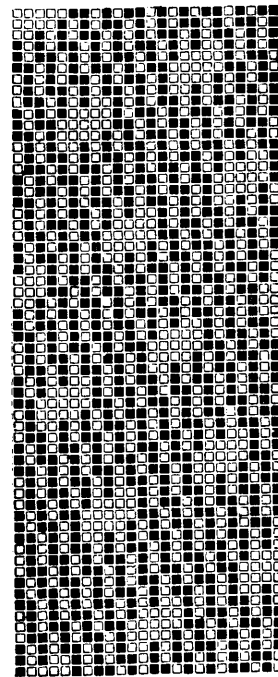


FIG. 733.

Fig. 737	. . . . .	18 × 18
Fig. 738	. . . . .	18 × 36
Fig. 739	. . . . .	26 × 104
Fig. 740	. . . . .	32 × 96

FIG. 735.

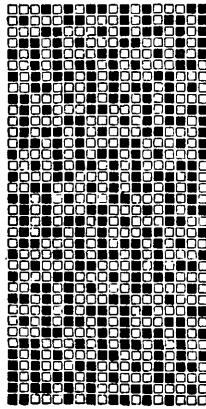
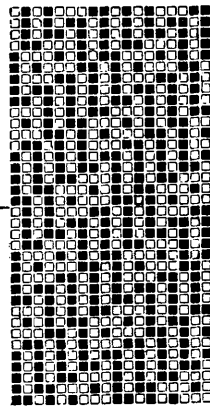
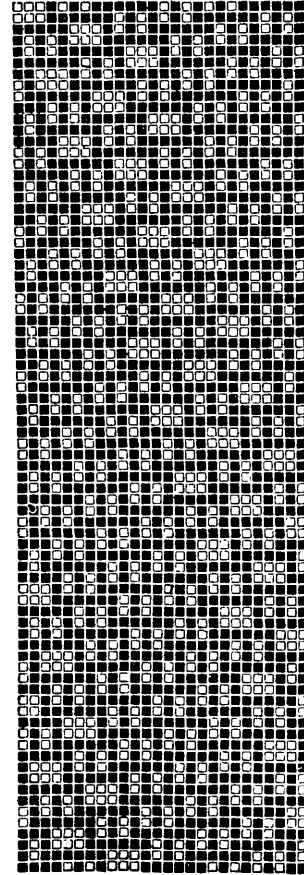
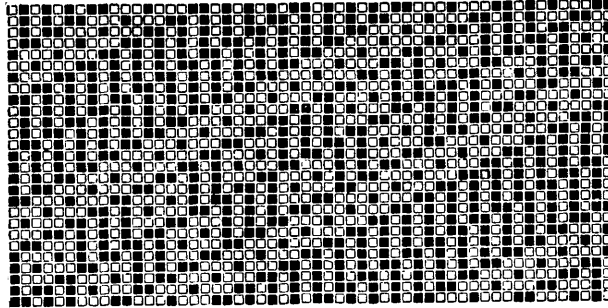


FIG. 736.

FIG. 737.

FIG. 738.

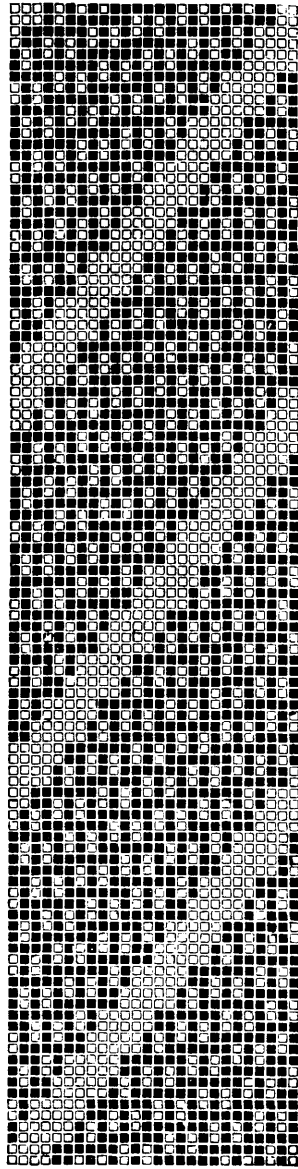


FIG. 739.

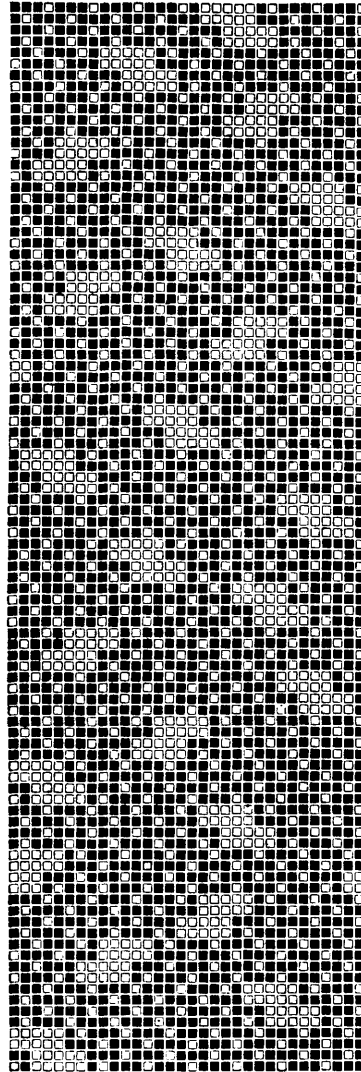


FIG. 740.

HONEYCOMB WEAVES

Attractive effects are obtained by arranging groups of warp and filling floats with a plain weave to form raised and sunken squares, the face of the cloth resembling a honeycomb. The honeycomb effect is especially pronounced when coarse cotton or zephyr yarn is used.

The ordinary honeycomb weaves are 4, 5, 6 or 7 harness pointed designs, Figs. 741 to 745. Modified forms are shown at Figs. 746 to 749, in which the honeycomb square is developed by two threads in each direction. Similar effects are obtained by throwing pronounced warp and filling floats on a plain weave, as shown at Figs. 750 to 755.

FIG. 741.

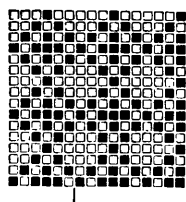


FIG. 742.

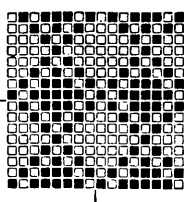


FIG. 743.

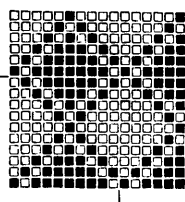


FIG. 744.

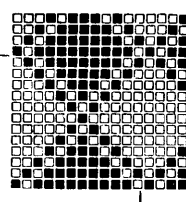


FIG. 745.

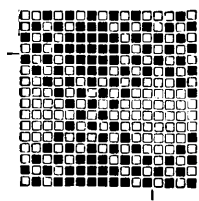


FIG. 746.

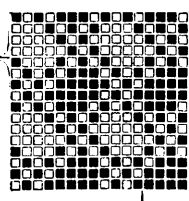


FIG. 747.

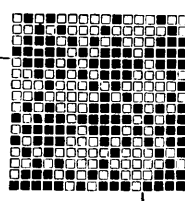


FIG. 748.

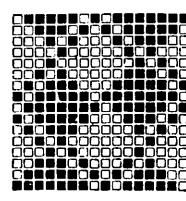


Fig. 741	6 × 6
Fig. 742	8 × 8
Fig. 743	10 × 10
Fig. 744	12 × 12
Fig. 745	12 × 12
Fig. 746	12 × 12
Fig. 747	12 × 12

FIG. 749.

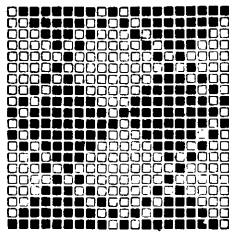


FIG. 750.

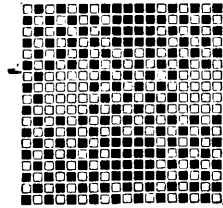
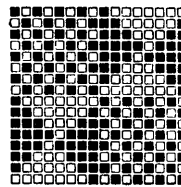


FIG. 751.

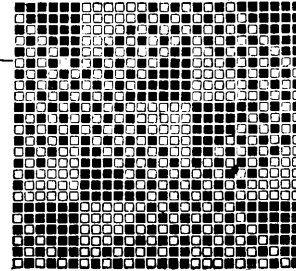


FIG. 752.

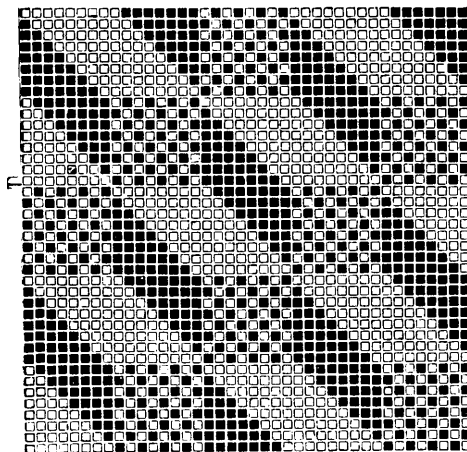


FIG. 753.

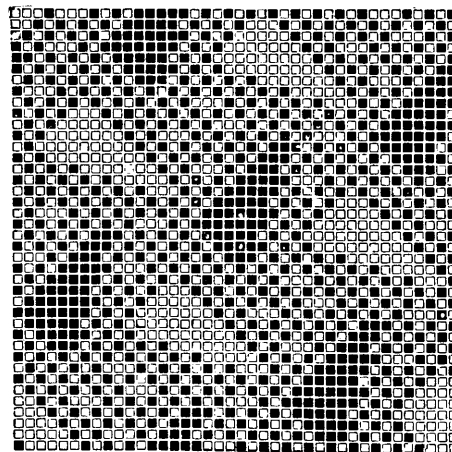


FIG. 754.

Fig. 748	16 × 16
Fig. 749	20 × 20
Fig. 750	16 × 16
Fig. 751	12 × 12
Fig. 752	20 × 18
Fig. 753	24 × 24
Fig. 754	40 × 40
Fig. 755	40 × 40

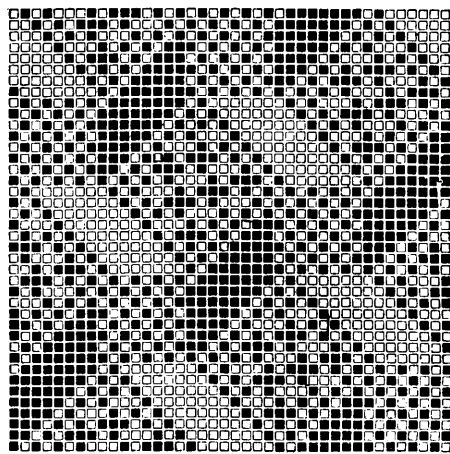


FIG. 755.

Fig. 759	10 × 10
Fig. 760	12 × 12
Fig. 761	16 × 16
Fig. 762	20 × 20
Fig. 763	24 × 24

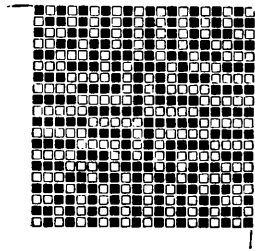


FIG. 762.

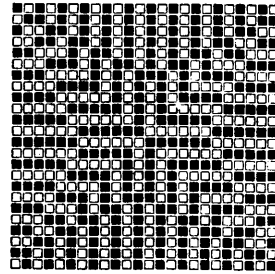


FIG. 763.

LACE OR MOCK LENO WEAVES

These weaves are designed to cause apertures or open spaces in the cloth, and are called lace or mock leno weaves from the resemblance to lace and leno fabrics.

The mock leno weave is used chiefly for ladies' dress goods. The open or lace effect is often height-

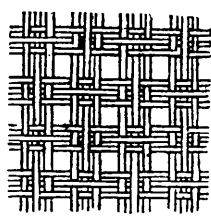


FIG. 764.



FIG. 765.

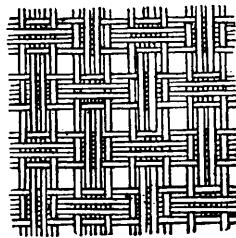


FIG. 766.



FIG. 767.

ened by making the goods with a plain back of a contrasting color, which shows through the openings in the face weave.

Groups of three or more warp or filling threads are interlaced in such a way that the threads of each group can come together easily in one bunch, while they are separated from the adjacent groups by reason of the last thread of one group and the first thread of the next group being interlaced in directly opposite order. Such an intersection prevents the two threads from coming together and causes an opening at this point.

A 6-leaf mock leno weave is shown at Fig. 765. The interlacing of the threads is shown at Fig. 764. As pick 2 floats under threads 1, 2 and 3, and over threads 4, 5 and 6, picks 1 and 3, which interlace the

warp in the same order, are left free to approach each other so that picks 1, 2 and 3 are brought together in a bunch. Picks 4, 5 and 6 are likewise brought together because pick 5 floats over and under each successive group of 3 warp threads, allowing picks 4 and 6 to come together and form a group with pick 5. The two groups of three picks each are separated by the breaks in the weave between picks 3 and 4, and

FIG. 768.

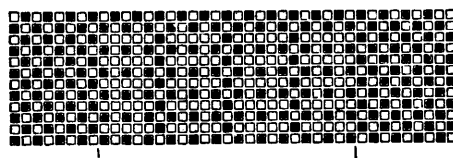
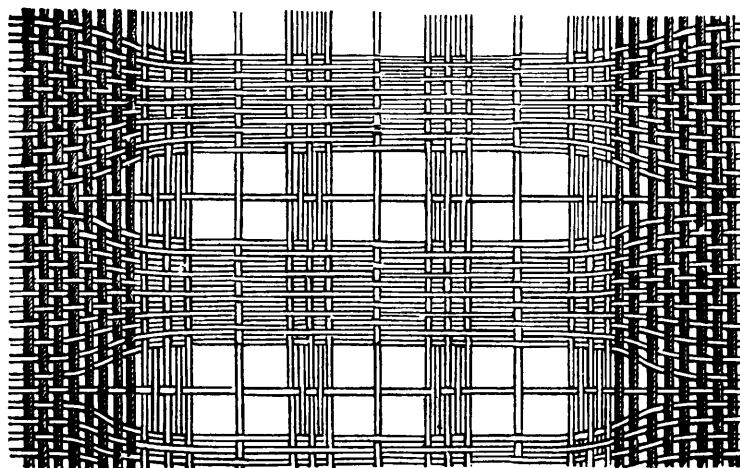


FIG. 769.

between picks 6 and 1, causing an open space in the cloth at each of these points.

The floating of warp threads 2 and 5 alternately under and over successive groups of three picks, together with the breaks between threads 3 and 4 and between threads 6 and 1, causes in like manner a slit or open space in the warp between threads 3 and 4 and between threads 6 and 1.

These slits in the warp can be enlarged by reeding 3 threads in a dent and bringing a wire of the reed between threads 3 and 4 and also between threads 6 and 1. Skipping a dent at each of these points makes the slit still wider.

FIG. 770.

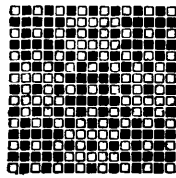


FIG. 771.

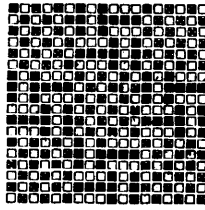


FIG. 772.

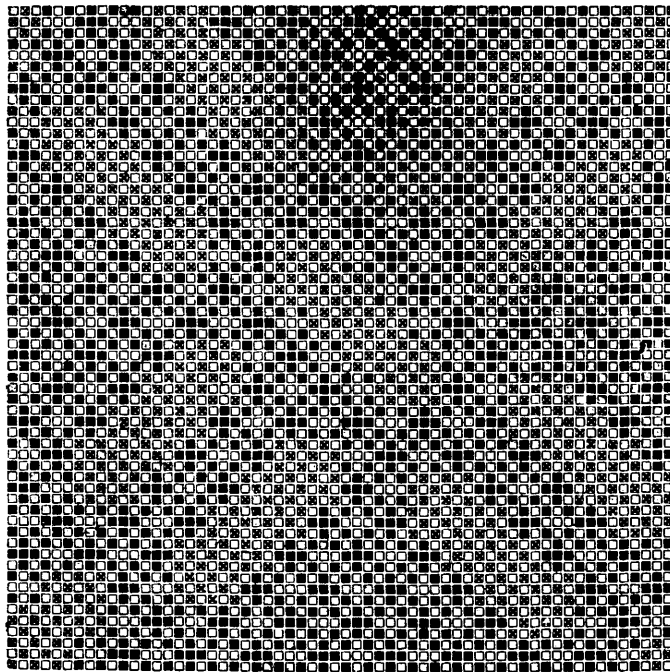
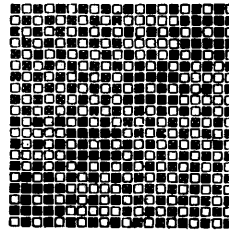


FIG. 773.

A 4 and 4 mock leno weave is shown at Figs. 766 and 767. From what has been said regarding the 3 and 3 weave, Fig. 765, it is evident that the best effect will be obtained at Figs. 766 and 767 by reeding 4

threads in a dent and bringing a reed wire or empty dent between threads 4 and 5 and between threads 8 and 1.

A 5 and 5 mock leno weave is shown at Fig. 770.

Fig. 769 shows a weave for the mock leno stripe effect, Fig. 768.

Very attractive patterns are obtained by combining these lace weaves with a plain ground weave, Figs. 771 to 773.

Fig. 765	6 × 6
Fig. 767	8 × 8
Fig. 769	40 × 12
Fig. 770	10 × 10
Fig. 771	12 × 12
Fig. 772	20 × 20
Fig. 773	60 × 60

Lace effects may also be obtained by weaving alternate groups of cotton and woolen threads in warp and filling, and afterward carbonizing the goods to remove the cotton.

WEAVES THAT DEFLECT CERTAIN THREADS

A peculiar effect is given to the cloth by the weaves shown at Figs. 774 to 794. It arises from the fact that the effect threads in the cloth do not retain the position indicated on the draft. Owing to the method of interlacing the effect picks, these threads are drawn in a slanting direction in the cloth.

FIG. 774.

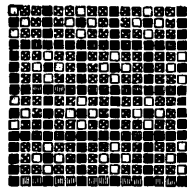


FIG. 775.

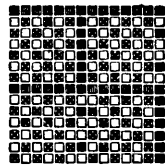


FIG. 776.

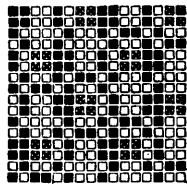
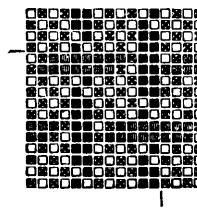


FIG. 777.

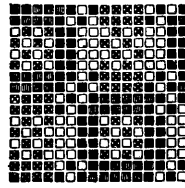


FIG. 778.

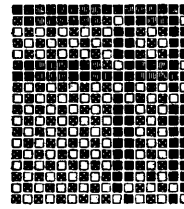


FIG. 779.

A different color is usually selected for the deflected threads. Mohair and loosely twisted two-color twist heighten the effect.

In Figs. 774 to 794 the effect threads in warp and filling are indicated by the black squares. The warp color pattern begins with the first thread at the left. The filling color pattern begins with the first thread at the bottom of the draft.

Unfortunately the changed position of the threads is not shown in the drafts. In Figs. 774, 775 and 794, the threads assume a curved or undulating form.

Figs. 786, 789, 791 and 793 are of special interest because the warp and filling threads separate, taking the position shown at Fig. 785. When the cloth is stretched, the threads are forced back into the position shown in the weave drafts, forming a rib effect.

FIG. 780.

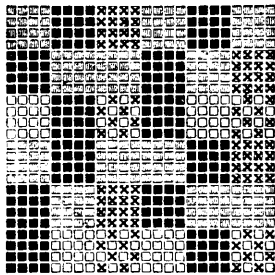


FIG. 781.

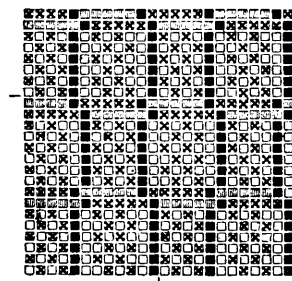
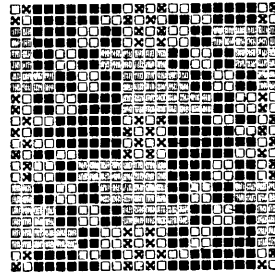


FIG. 782.

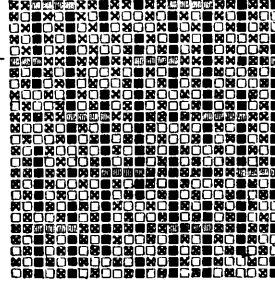


FIG. 783.

The filling floating on the face is indicated by the shaded squares. To increase the undulating effect of the filling, a weave that will facilitate the approach of the effect threads to each other is used. This is well illustrated by the twill in Fig. 794.

If Fig. 787 is woven with the warp and filling pattern, 4 red, 2 black, the part (a) will show a black and red checked effect, while in the part (b) the red will be completely covered.

In the following color patterns the words "light" and "dark" are used to indicate the contrasting colors in the pattern, such as light shade and dark shade, fine and coarse, worsted and mohair, etc. Usually the effect thread is ply yarn and coarser than the ground yarn.

FIG. 784.

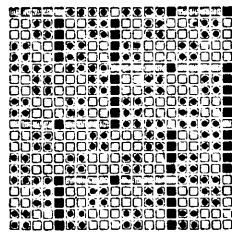


FIG. 785.



FIG. 786.

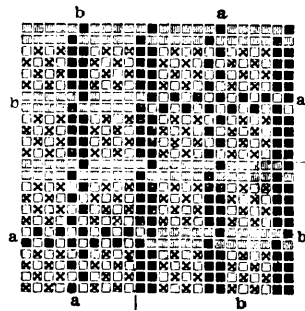
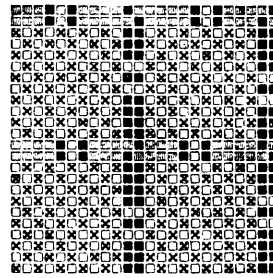


FIG. 787.

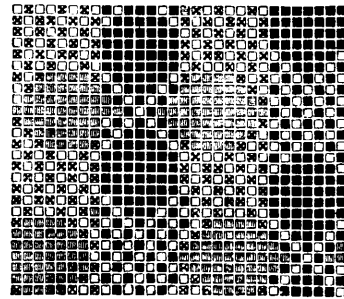


FIG. 788.

FIG. WEAVE

- | | | |
|-----|---------|---|
| 774 | 6 × 8 | Warp, 1 dark, 2 light; filling, 1 dark, 3 light |
| 775 | 14 × 4 | Warp, 6 light, 1 dark; filling, 6 light, 1 dark |
| 776 | 12 × 12 | Warp, 4 light, 2 dark; filling, 4 light, 2 dark |
| 777 | 16 × 16 | Warp, 2 dark, 2 light; filling, 2 dark, 2 light |
| 778 | 16 × 16 | Warp, 4 light, 4 dark; filling, 2 dark, 2 light, 2 dark |

WEAVES THAT DEFLECT CERTAIN THREADS 173

FIG.	WEAVE
779	16 × 18 Warp, 9 light, 2 dark, 3 light, 2 dark ; filling, 11 light, 2 dark, 3 light, 2 dark
780	24 × 24 Warp, 8 dark, 4 light ; filling, 4 light, 8 dark
781	24 × 24 Warp, 2 light, 8 dark, 2 light ; fill- ing, 2 light, 8 dark, 2 light
782	12 × 16 Warp, 4 light, 2 dark ; filling, 6 light, 2 dark
783	12 × 20 Warp, 2 light, 1 dark ; filling, 4 light, 1 dark
784	20 × 20 Warp, 4 light, 1 dark ; filling, 4 light, 1 dark

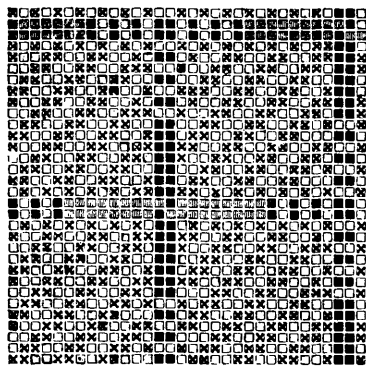


FIG. 789.

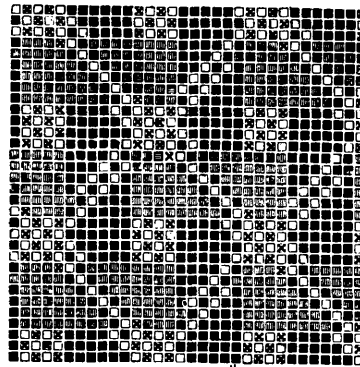


FIG. 790.

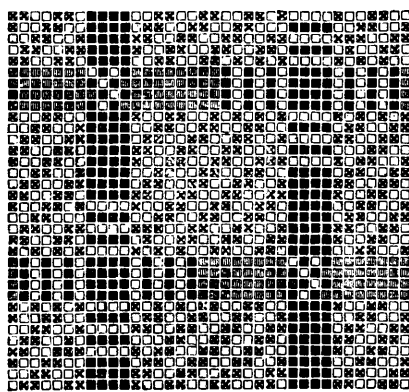


FIG. 791.

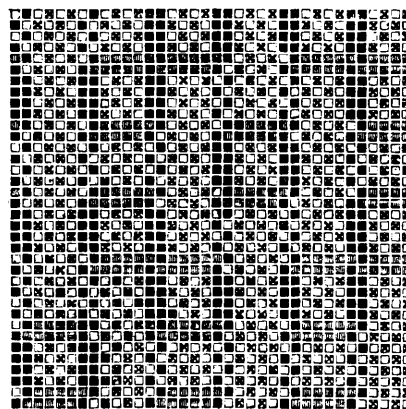


FIG. 792.

FIG.	WEAVE	
786	24 × 24	Warp, 10 light, 2 dark; filling, 10 light, 2 dark
787	24 × 24	Warp, 4 light, 2 dark; filling, 4 light, 2 dark
788	30 × 26	Warp, 8 light, 7 dark; filling, 7 dark, 6 light
789	32 × 32	Warp, 13 light, 2 dark, 14 light, 2 dark, 1 light; filling, same as warp
790	20 × 20	Warp, 1 dark, 4 light, 5 dark; filling, 3 light, 6 dark, 1 light
791	36 × 34	Warp, 7 light, 4 dark, 14 light, 4 dark, 7 light; filling, 8 light, 4 dark, 13 light, 4 dark, 5 light
792	36 × 36	Warp, 2 dark, 4 light; filling, 2 dark, 4 light
793	12 × 14	Warp, 8 light, 4 dark; filling, 10 light, 4 dark
794	52 × 22	Warp, 9 light, 1 dark, 6 light, 1 dark, 9 light; filling, 10 light, 1 dark

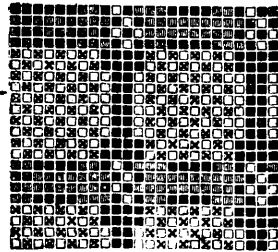


FIG. 793.

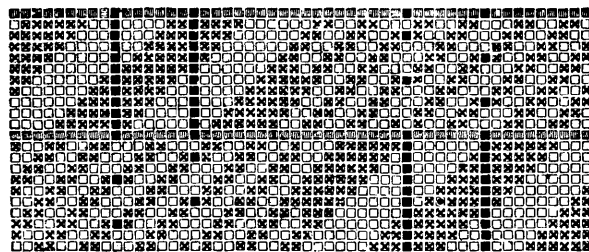


FIG. 794.

CREPE WEAVES

These are weaves in which the warp and filling are interlaced so as to give the cloth a mixed or uniformly mottled appearance. The more uniform this mixed effect is, the better is the crêpe effect considered to be. In constructing crêpe fabrics great care must be taken to avoid stripe effects and to have each thread stitched with floats of practically the same length. Crêpe weaves are used for all varieties of fabrics.

No general rules for the construction of these weaves can be laid down, as each weave is peculiar to itself, but examples will be given to show how they are drafted. A number of the most frequently used crêpe weaves are shown at Figs. 795 to 919. The limits of the pattern are indicated by the lines at the left side and the bottom of the respective drafts.

The crêpe weaves, Figs. 795 to 919, are drafted as follows :

Fig. 795.

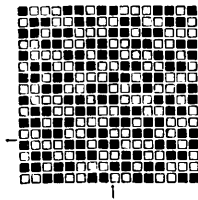


Fig. 796.

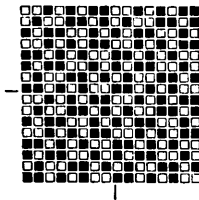


Fig. 797.

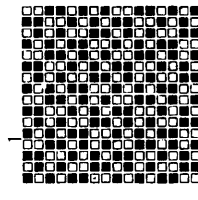


Fig. 798.

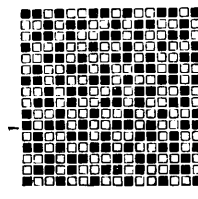
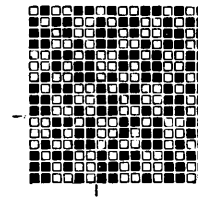


Fig. 799.

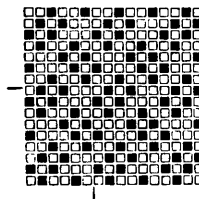


Fig. 800.

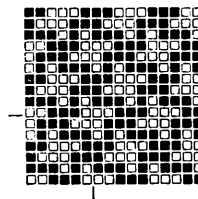


Fig. 801.

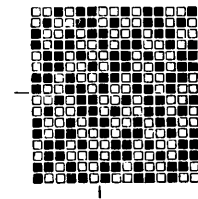


Fig. 802.

Fig. 795	8 × 4
Fig. 796	8 × 8
Fig. 797	8 × 4
Fig. 798	6 × 6
Fig. 799	6 × 6
Fig. 800	6 × 6
Fig. 801	6 × 6
Fig. 802	6 × 8

FIG. 803.

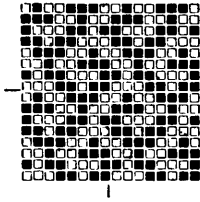


FIG. 804.

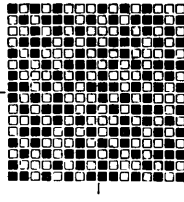


FIG. 805.

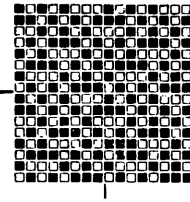


FIG. 806.

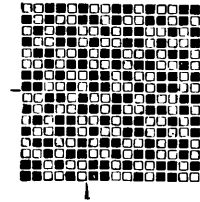
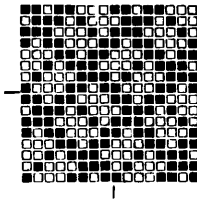


FIG. 807.

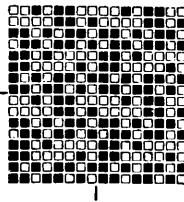


FIG. 808.

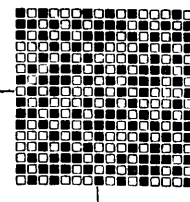


FIG. 809.

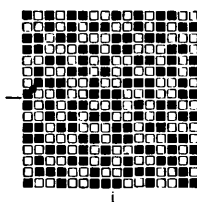


FIG. 810.

FIG. 811.

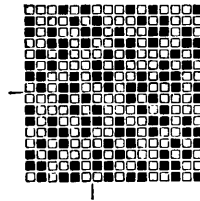


FIG. 812.

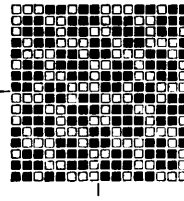


FIG. 813.

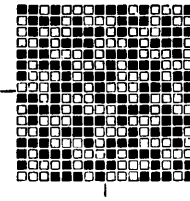


FIG. 814.

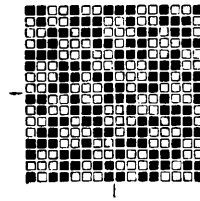
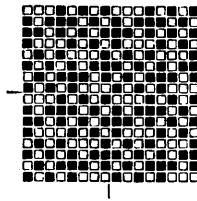


FIG. 815.

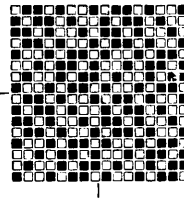


FIG. 816.

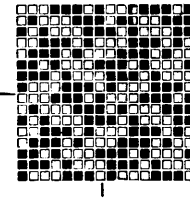


FIG. 817.

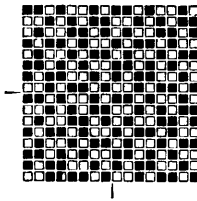


FIG. 818.

Fig. 803	8×8
Fig. 804	8×8
Fig. 805	8×8
Fig. 806	8×8
Fig. 807	6×8
Fig. 808	8×8
Fig. 809	8×8
Fig. 810	8×8

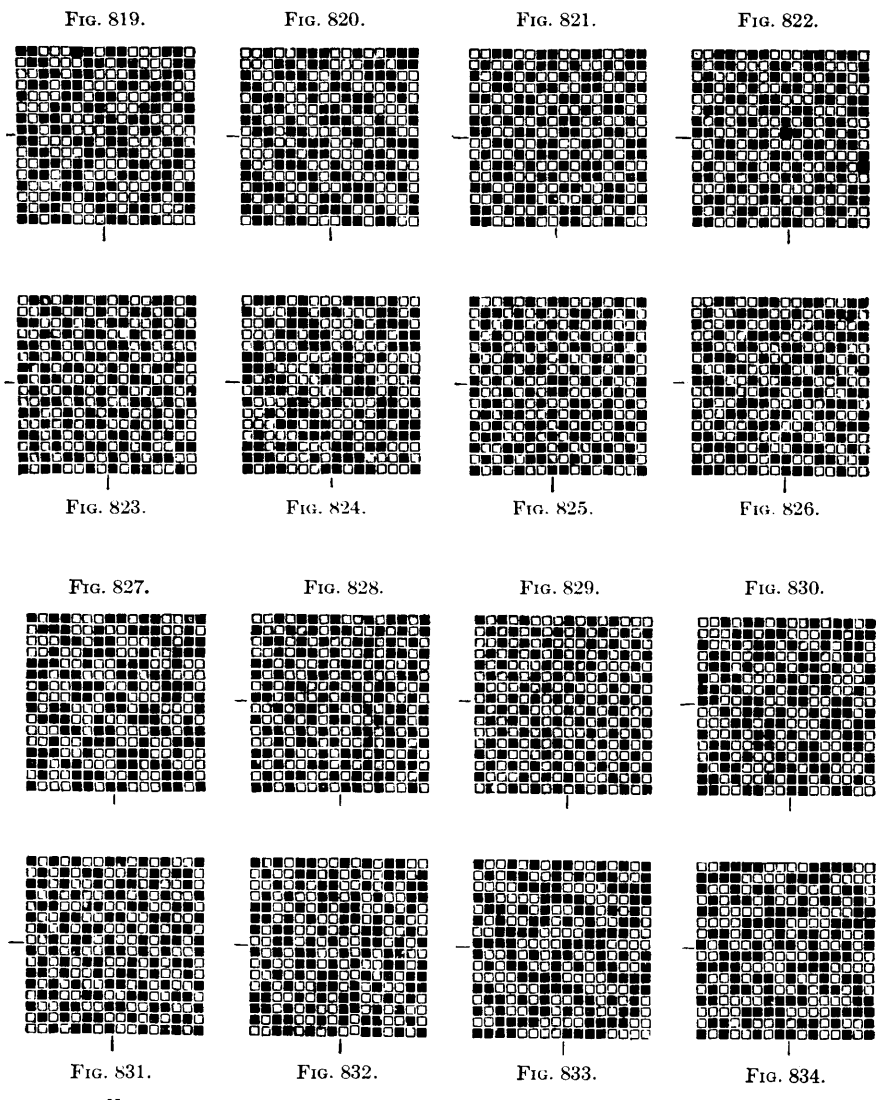


Fig. 811	6 × 8
Fig. 812	8 × 8
Fig. 813	8 × 8
Fig. 814	8 × 8
Fig. 815	8 × 8
Fig. 816	8 × 8
Fig. 817	8 × 8
Fig. 818	8 × 8

FIG. 835.

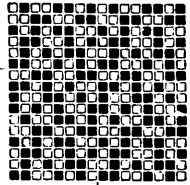


FIG. 836.

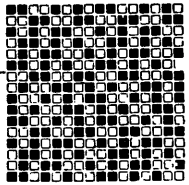


FIG. 837.

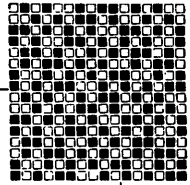


FIG. 838.

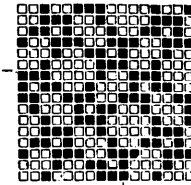


FIG. 839.

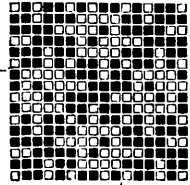


FIG. 840.

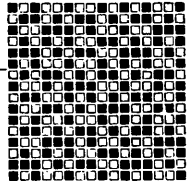


FIG. 841.

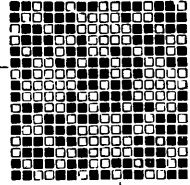


FIG. 842.

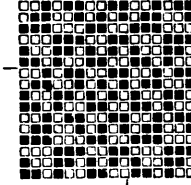


FIG. 843.

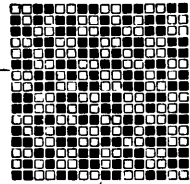


FIG. 844.

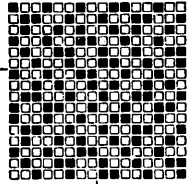


FIG. 845.

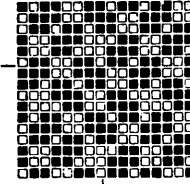


FIG. 846.

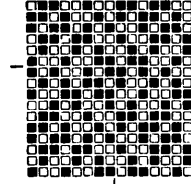


FIG. 847.

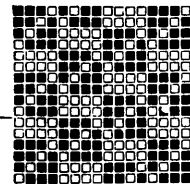


FIG. 848.

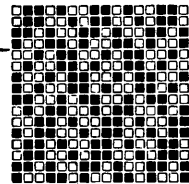


FIG. 849.

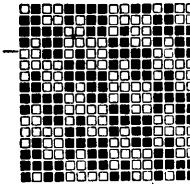


FIG. 850.

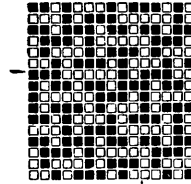


Fig. 819	8 × 8
Fig. 820	8 × 8
Fig. 821	8 × 8
Fig. 822	8 × 8
Fig. 823	8 × 8
Fig. 824	8 × 8
Fig. 825	8 × 8
Fig. 826	8 × 8

FIG. 851.

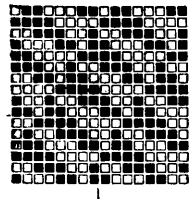


FIG. 852.

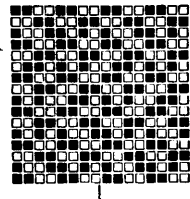


FIG. 853.

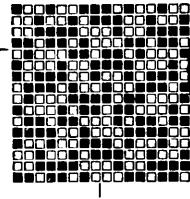


FIG. 854.

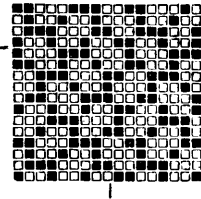


FIG. 855.

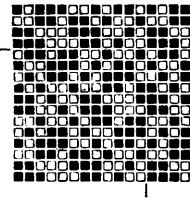


FIG. 856.

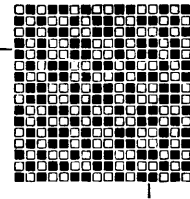


FIG. 857.

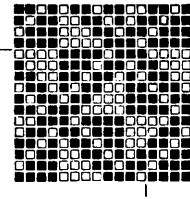


FIG. 858.

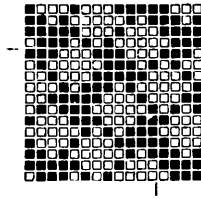


FIG. 859.

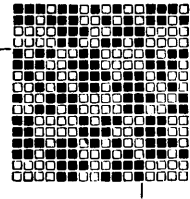


FIG. 860.

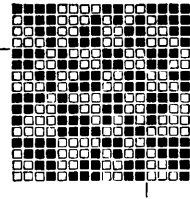


FIG. 861.

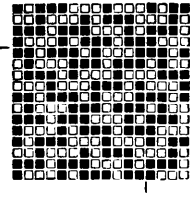


FIG. 862.

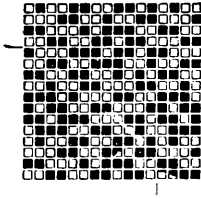


FIG. 863.

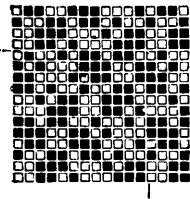


FIG. 864.

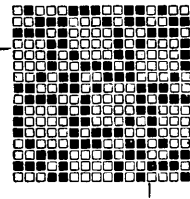


FIG. 865.

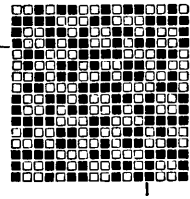


FIG. 866.

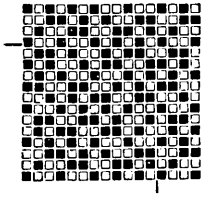


Fig. 827	8 × 8
Fig. 828	8 × 8
Fig. 829	8 × 8
Fig. 830	8 × 8
Fig. 831	8 × 8
Fig. 832	8 × 8
Fig. 833	8 × 8
Fig. 834	8 × 8
Fig. 835	8 × 10
Fig. 836	8 × 10
Fig. 837	8 × 10
Fig. 838	10 × 10
Fig. 839	10 × 10
Fig. 840	10 × 10
Fig. 841	10 × 10
Fig. 842	10 × 10
Fig. 843	8 × 10
Fig. 844	10 × 10
Fig. 845	10 × 10
Fig. 846	10 × 10
Fig. 847	12 × 6
Fig. 848	6 × 12
Fig. 849	12 × 6

FIG. 867.

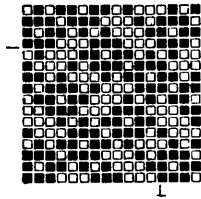


FIG. 868.

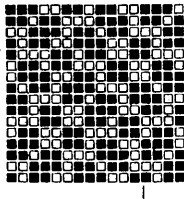


FIG. 869.

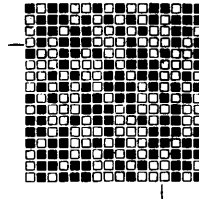


FIG. 870.

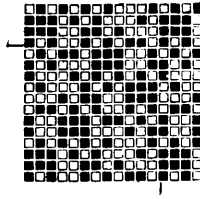


FIG. 871.

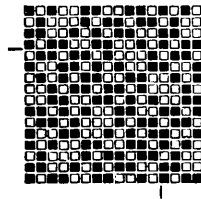


FIG. 872.

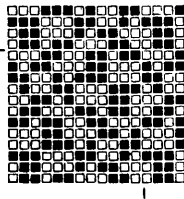


FIG. 873.

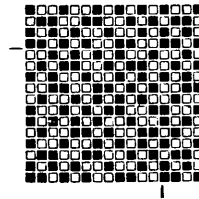


FIG. 874.

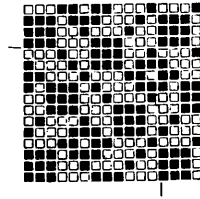


Fig. 850	10 × 10
Fig. 851	8 × 12
Fig. 852	8 × 12
Fig. 853	10 × 12
Fig. 854	10 × 12
Fig. 855	12 × 12
Fig. 856	12 × 12
Fig. 857	12 × 12
Fig. 858	12 × 12
Fig. 859	12 × 12
Fig. 860	12 × 12
Fig. 861	12 × 12
Fig. 862	12 × 12
Fig. 863	12 × 12
Fig. 864	12 × 12
Fig. 865	12 × 12
Fig. 866	12 × 12
Fig. 867	12 × 12
Fig. 868	12 × 12
Fig. 869	12 × 12
Fig. 870	12 × 12
Fig. 871	12 × 12
Fig. 872	12 × 12

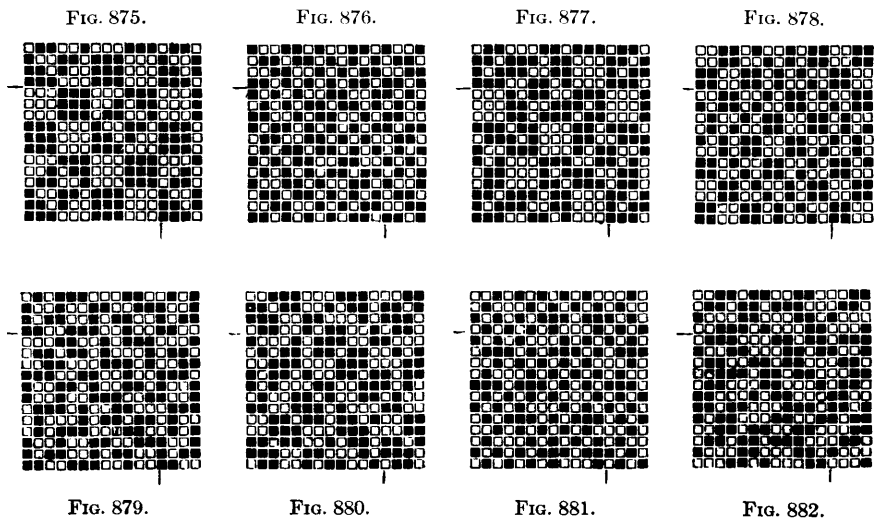


FIG. 879.

FIG. 880.

FIG. 881.

FIG. 882.

Fig. 873	12 × 12
Fig. 874	12 × 12
Fig. 875	12 × 12
Fig. 876	12 × 12
Fig. 877	12 × 12
Fig. 878	12 × 12
Fig. 879	12 × 12
Fig. 880	12 × 12
Fig. 881	12 × 12
Fig. 882	12 × 12
Fig. 883	12 × 12
Fig. 884	12 × 12
Fig. 885	12 × 12
Fig. 886	12 × 12
Fig. 887	12 × 12
Fig. 888	12 × 14
Fig. 889	12 × 16
Fig. 890	16 × 12
Fig. 891	16 × 16
Fig. 892	16 × 16
Fig. 893	16 × 16
Fig. 894	16 × 16
Fig. 895	16 × 16

FIG. 883.

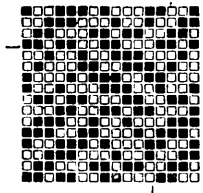


FIG. 884.

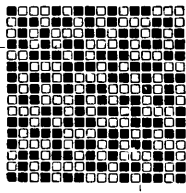


FIG. 885.

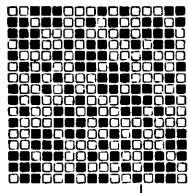


FIG. 886.

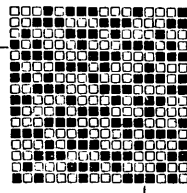


FIG. 887.

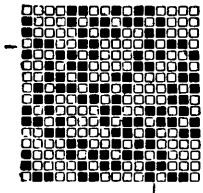


FIG. 888.

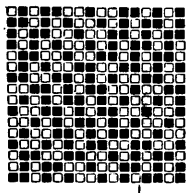


FIG. 889.

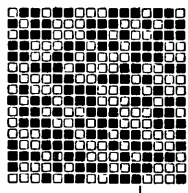


FIG. 890.

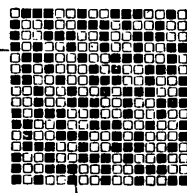


Fig. 896	16 × 16
Fig. 897	16 × 16
Fig. 898	16 × 16
Fig. 899	16 × 16
Fig. 900	16 × 16
Fig. 901	16 × 16
Fig. 902	16 × 16
Fig. 903	16 × 16

FIG. 891.

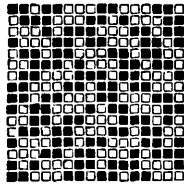


FIG. 892.

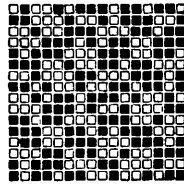


FIG. 893.

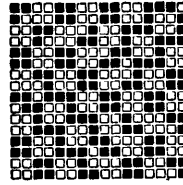


FIG. 894.

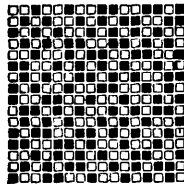
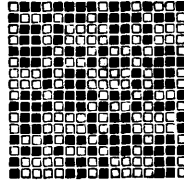


FIG. 895.

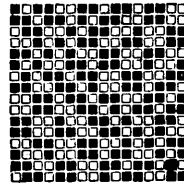


FIG. 896.

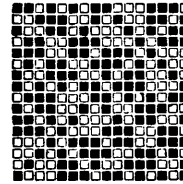


FIG. 897.

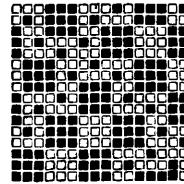


FIG. 898.

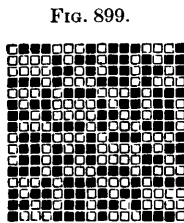


FIG. 899.

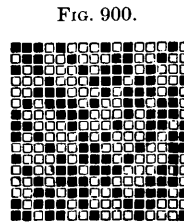


FIG. 900.

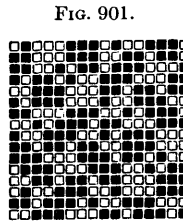


FIG. 901.

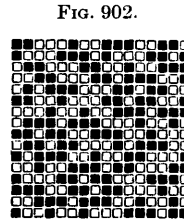


FIG. 902.

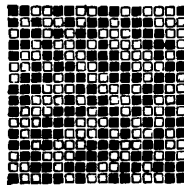


FIG. 903.

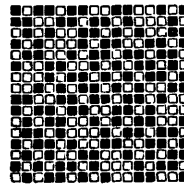


FIG. 904.

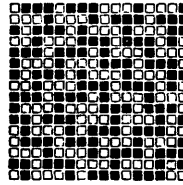


FIG. 905.

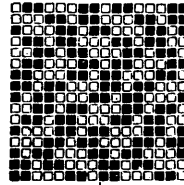


FIG. 906.

Fig. 904	16 × 16
Fig. 905	16 × 16
Fig. 906	8 × 16
Fig. 907	16 × 16
Fig. 908	16 × 12

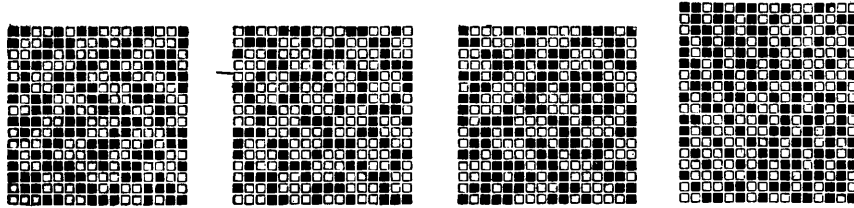


FIG. 907. FIG. 908. FIG. 909. FIG. 910.

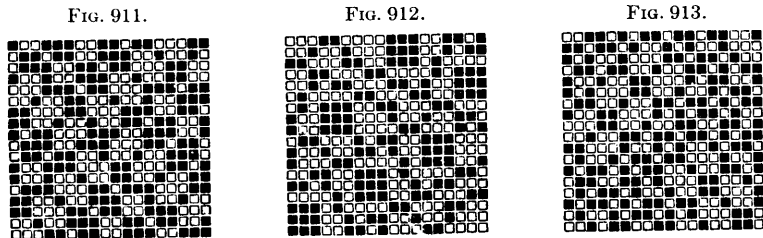


FIG. 911. FIG. 912. FIG. 913.

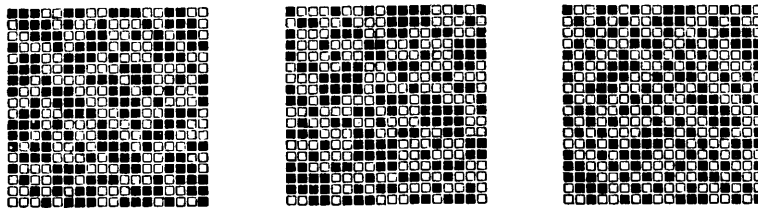


FIG. 914. FIG. 915. FIG. 916.

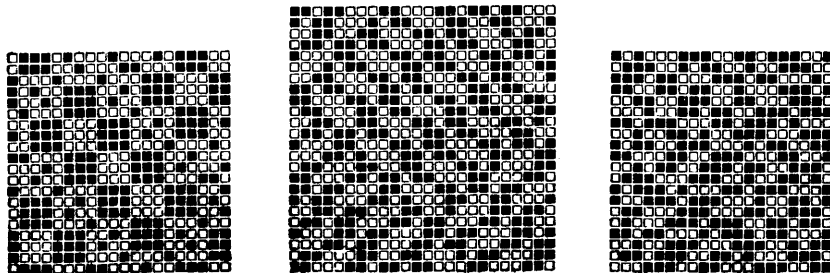


FIG. 917. FIG. 918. FIG. 919.

Fig. 909	16 × 16
Fig. 910	16 × 18
Fig. 911	18 × 18
Fig. 912	18 × 18
Fig. 913	18 × 18
Fig. 914	18 × 18
Fig. 915	18 × 18
Fig. 916	18 × 18
Fig. 917	20 × 20
Fig. 918	24 × 24
Fig. 919	20 × 20

CRÊPE WEAVES DERIVED FROM SATIN WEAVES

The satin weave is first drafted and then one or more stitching points are added, either above, below or at one side of the satin points, the number depending on the distance between the latter. Other weaves may be drafted in the space between the satin points, the size of the weave pattern depending on the number of threads in the satin weave. Several examples are shown at Figs. 920 to 931. The points or risers of the original satin weave are indicated by different type in a part of each draft.

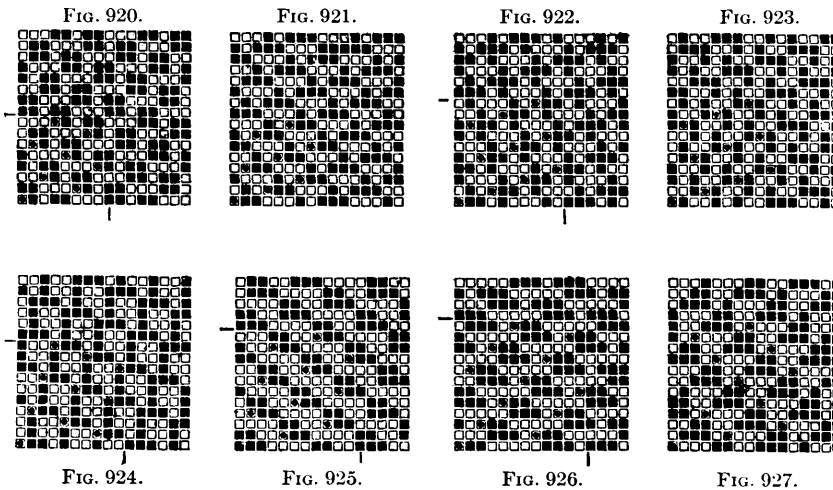


Fig. 920	8 × 8
Fig. 921	8 × 8
Fig. 922	10 × 10
Fig. 923	10 × 10
Fig. 924	10 × 10
Fig. 925	11 × 11
Fig. 926	12 × 12
Fig. 927	12 × 12
Fig. 928	13 × 13
Fig. 929	13 × 13
Fig. 930	15 × 15
Fig. 931	16 × 16

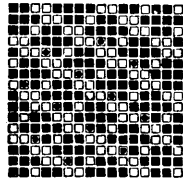


FIG. 928.

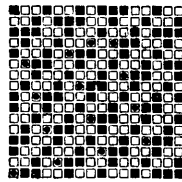


FIG. 929.

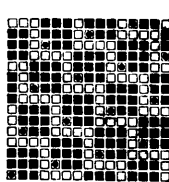


FIG. 930.

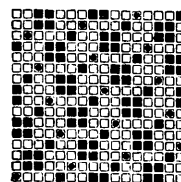


FIG. 931.

CRÊPE EFFECTS BY ARRANGING FLOATS IN SATIN ORDER

A great variety of crêpe effects can be obtained by forming a group of risers and then arranging it in satin order with any desired number of threads in the pattern. The resulting weave may have warp and filling threads floating too far; these must be stitched down in some regular order to connect the groups. Examples are shown at Figs. 932 to 996.

Above each of the first nine drafts, Figs. 932 to 940,

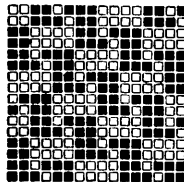


FIG. 932.

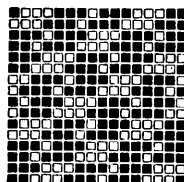


FIG. 933.

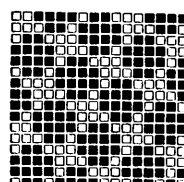


FIG. 934.

is placed the group of floats that is arranged in crêpe weave order.

- Fig. 932 10 × 10 5-leaf satin, 1, 4, 2, 5, 3
- Fig. 933 10 × 10 5-leaf satin, 1, 3, 5, 2, 4
- Fig. 934 10 × 10 5-leaf satin, 1, 4, 2, 5, 3
- Fig. 935 10 × 10 5-leaf satin, 1, 4, 2, 5, 3

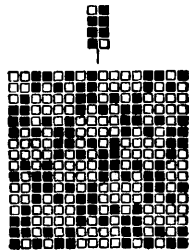


FIG. 935.

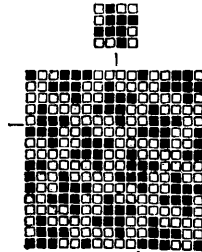


FIG. 936.

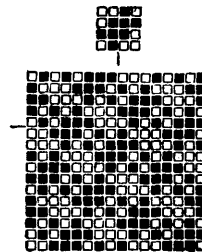


FIG. 937.

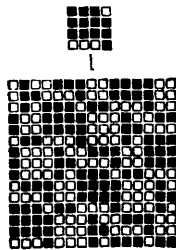


FIG. 938.

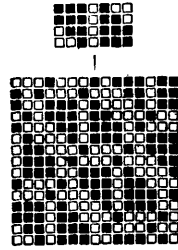


FIG. 939.

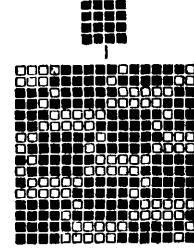


FIG. 940.

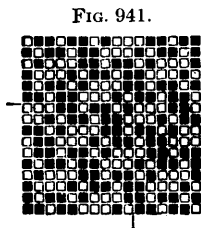


FIG. 941.

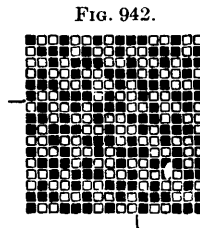


FIG. 942.

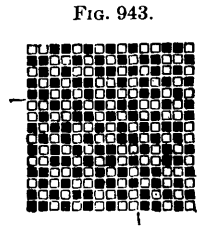


FIG. 943.

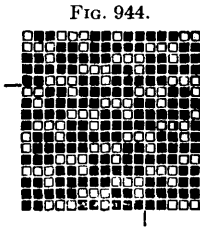


FIG. 944.

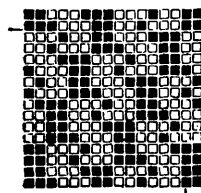


FIG. 945.

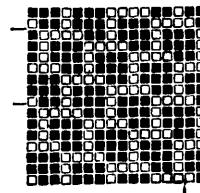


FIG. 946.

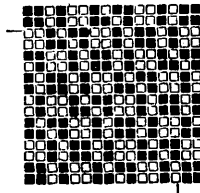


FIG. 947.

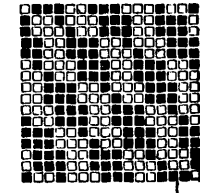


FIG. 948.

Fig. 936	. . . .	10 × 10	5-leaf satin, 1, 4, 2, 5, 3
Fig. 937	. . . .	10 × 10	5-leaf satin, 2, 5, 3, 4, 1
Fig. 938	. . . .	15 × 15	5-leaf satin, 1, 3, 5, 2, 4
Fig. 939	. . . .	15 × 15	5-leaf satin, 1, 3, 5, 2, 4
Fig. 940	. .	16 × 16	8-leaf satin, 1, 4, 7, 2, 5, 8, 3, 6
Fig. 941	. . . . . . . .	10 × 10	5-leaf satin
Fig. 942	. . . . . . . .	10 × 10	5-leaf satin
Fig. 943	. . . . . . . .	10 × 10	5-leaf satin
Fig. 944	. . . . . . . .	11 × 11	11-leaf satin
Fig. 945	. . . . . . . .	14 × 14	7-leaf satin
Fig. 946	. . . . . . . .	14 × 7	7-leaf satin

FIG. 949.

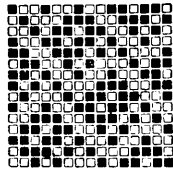


FIG. 950.

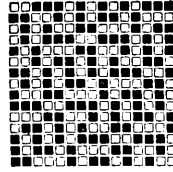


FIG. 951.

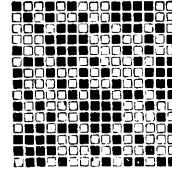


FIG. 952.

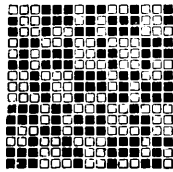
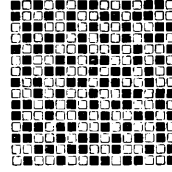


FIG. 953.

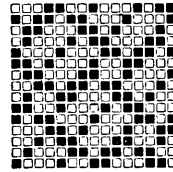


FIG. 954.

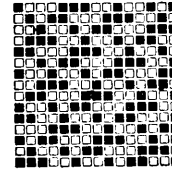


FIG. 955.

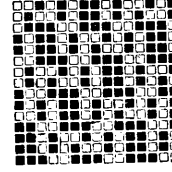


FIG. 956.

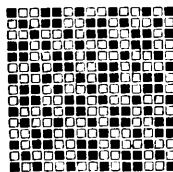


FIG. 957.

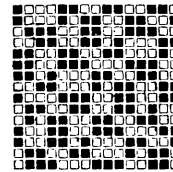


FIG. 958.

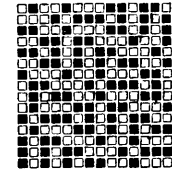


FIG. 959.

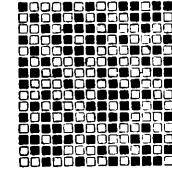


FIG. 960.

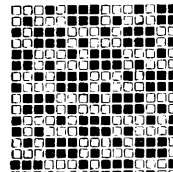


FIG. 961.

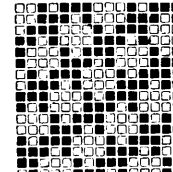


FIG. 962.

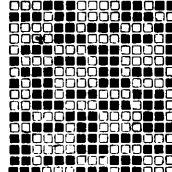


FIG. 963.

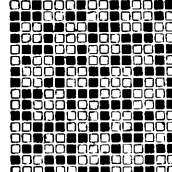


FIG. 964.

Fig. 947	. . . . .	14 × 14	7-leaf satin
Fig. 948	. . . . .	14 × 14	7-leaf satin
Fig. 949	. . . . .	15 × 15	5-leaf satin
Fig. 950	. . . . .	15 × 15	5-leaf satin
Fig. 951	. . . . .	15 × 15	5-leaf satin
Fig. 952	. . . . .	15 × 15	5-leaf satin
Fig. 953	. . . . .	15 × 15	5-leaf satin
Fig. 954	. . . . .	15 × 15	5-leaf satin
Fig. 955	. . . . .	15 × 15	15-leaf satin
Fig. 956	. . . . .	10 × 15	5-leaf satin
Fig. 957	. . . . .	15 × 15	15-leaf satin
Fig. 958	. . . . .	15 × 15	5-leaf satin

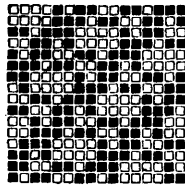


FIG. 965.

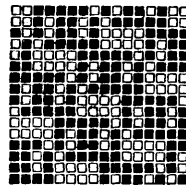


FIG. 966.

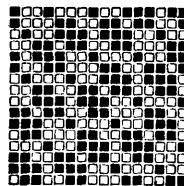


FIG. 967.

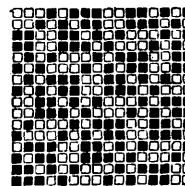


FIG. 968.

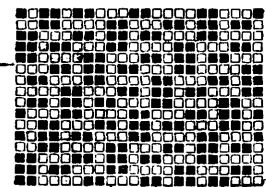


FIG. 969.

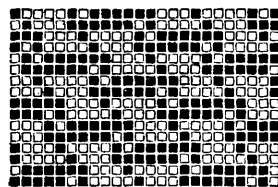


FIG. 970.

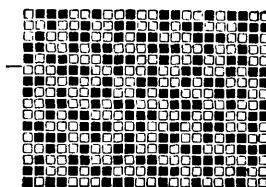


FIG. 971.

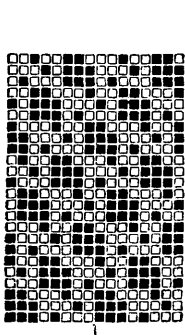


FIG. 972.

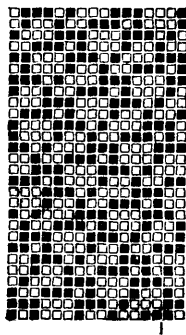


FIG. 973.

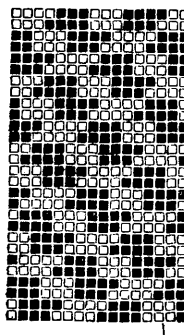


FIG. 974.

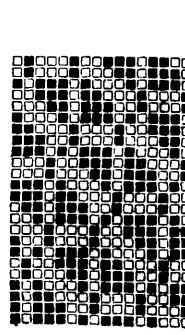


FIG. 975.

Fig. 959	. . . . .	15 × 15	5-leaf satin
Fig. 960	. . . . .	15 × 15	5-leaf satin
Fig. 961	. . . . .	8 × 16	8-leaf satin
Fig. 962	. . . . .	16 × 16	16-leaf satin
Fig. 963	. . . . .	16 × 16	8-leaf satin

FIG. 976.

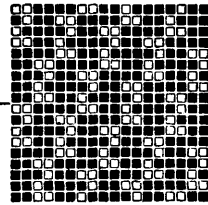


FIG. 977.

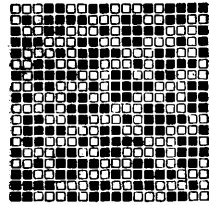


FIG. 978.

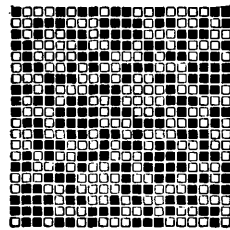
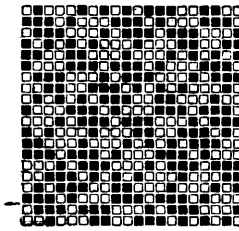


FIG. 979.

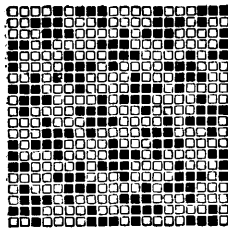


FIG. 980.

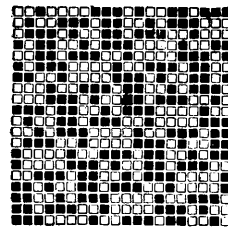


FIG. 981.

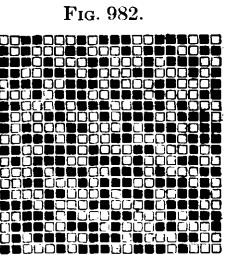


FIG. 982.

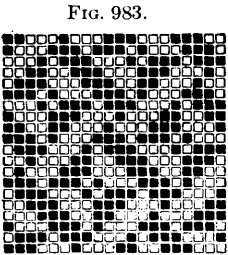


FIG. 983.

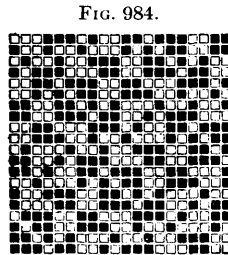


FIG. 984.

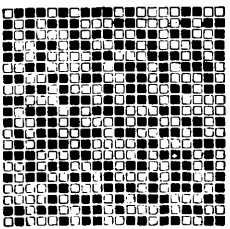


FIG. 985.

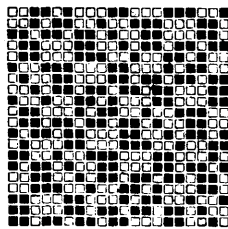


FIG. 986.

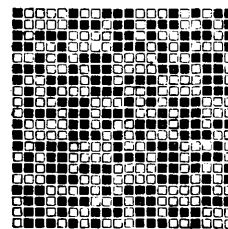


FIG. 987.

Fig. 964	. . . . .	16 × 16	8-leaf satin
Fig. 965	. . . . .	16 × 16	8-leaf satin
Fig. 966	. . . . .	16 × 16	8-leaf satin
Fig. 967	. . . . .	16 × 16	8-leaf satin

FIG. 988.

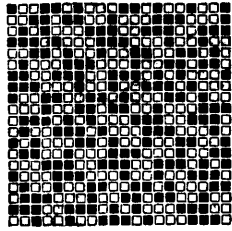


FIG. 989.

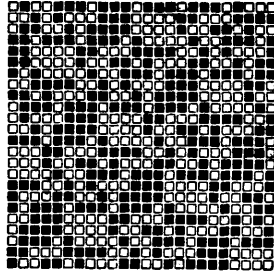


FIG. 990.

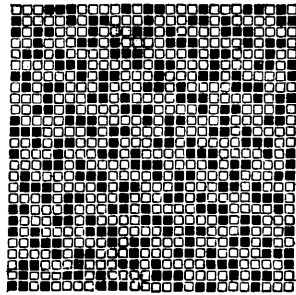
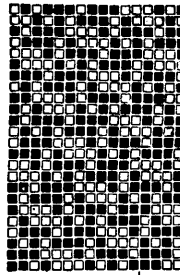


FIG. 991.

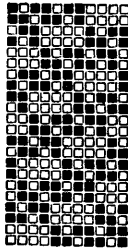


FIG. 992.

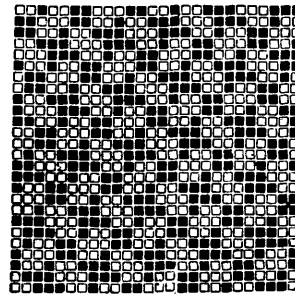


FIG. 993.

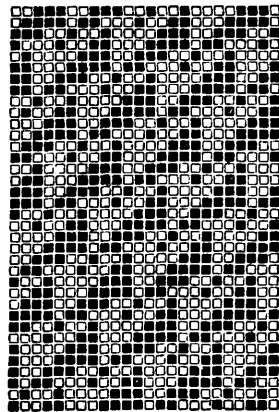


FIG. 994.

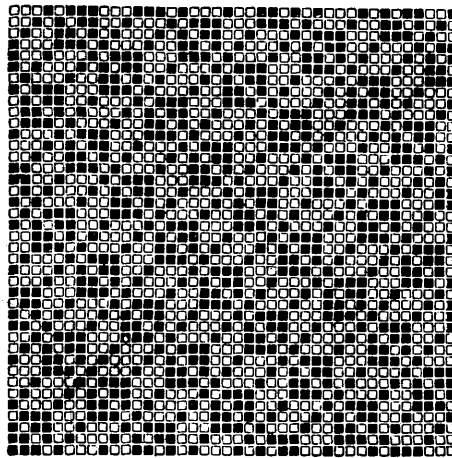


FIG. 995.

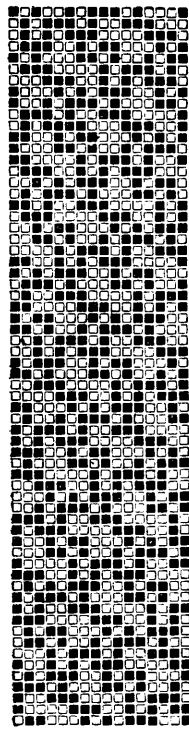


FIG. 996.

	Fig. 968 . . .	16 × 16	8-leaf satin
	Fig. 969 . . .	22 × 11	11-leaf satin
	Fig. 970 . . .	16 × 16	8-leaf satin
	Fig. 971 . . .	22 × 11	11-leaf satin
	Fig. 972 . . .	8 × 24	8-leaf satin
	Fig. 973 . . .	14 × 28	14-leaf satin
	Fig. 974 . . .	14 × 28	14-leaf satin
	Fig. 975 . . .	16 × 24	8-leaf satin
	Fig. 976 . . .	18 × 9	9-leaf satin
	Fig. 977 . . .	18 × 18	18-leaf satin
	Fig. 978 . . .	20 × 20	5-leaf satin
	Fig. 979 . . .	20 × 20	5-leaf satin
	Fig. 980 . . .	20 × 20	10-leaf satin
	Fig. 981 . . .	20 × 20	10-leaf satin
	Fig. 982 . . .	20 × 20	10-leaf satin
	Fig. 983 . . .	20 × 20	5-leaf satin
	Fig. 984 . . .	20 × 20	5-leaf satin
	Fig. 985 . . .	20 × 20	5-leaf satin
	Fig. 986 . . .	20 × 20	5-leaf satin
	Fig. 987 . . .	20 × 20	5-leaf satin
	Fig. 988 . . .	20 × 20	5-leaf satin
	Fig. 989 . . .	24 × 24	8-leaf satin
	Fig. 990 . . .	12 × 24	modified satin
	Fig. 991 . . .	26 × 26	26-leaf satin
	Fig. 992 . . .	11 × 22	modified satin

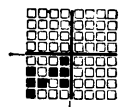


FIG. 997.

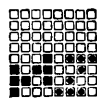


FIG. 998.

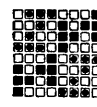


FIG. 999.

	Fig. 993 . . .	26 × 26	26-leaf satin
	Fig. 994 . . .	18 × 36	modified satin
	Fig. 995 . . .	40 × 40	modified satin
	Fig. 996 . . .	16 × 64	modified satin

CRÊPE BY TRANSPOSITION OF WEAVES IN CHECKERBOARD ORDER

Crêpe weaves are obtained by arranging a base weave in different positions in the different squares of the draft in regular and reversed form.

If, for example, an 8-leaf crêpe is wanted, the threads of the pattern are divided in each direction on the drafting paper into two equal parts, which divides the entire area into four equal parts. A balanced weave is then drafted in the lower left-hand square, as shown at Fig. 997.

The same weave reversed, risers and sinkers being transposed, is then drafted in the lower right-hand square, beginning with the last thread in the left-hand square so that the two threads will break with each other, Fig. 998. The upper half of the weave is then drafted, making the upper left-hand square like the lower right, and the upper right-hand square like the lower left, Fig. 999.

An unlimited number of attractive and useful crêpe weaves can be drafted by this method. Examples are shown at Figs. 1000 to 1027.

Fig. 1000	. . . . .	6 × 6
Fig. 1001	. . . . .	6 × 6
Fig. 1002	. . . . .	6 × 6
Fig. 1003	. . . . .	6 × 8
Fig. 1004	. . . . .	8 × 8
Fig. 1005	. . . . .	8 × 8
Fig. 1006	. . . . .	8 × 8

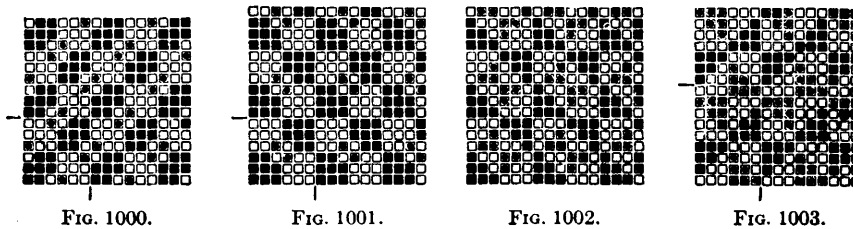


Fig. 1007	. . . . .	8 × 8
Fig. 1008	. . . . .	8 × 8
Fig. 1009	. . . . .	8 × 8
Fig. 1010	. . . . .	8 × 8
Fig. 1011	. . . . .	10 × 10
Fig. 1012	. . . . .	8 × 8
Fig. 1013	. . . . .	8 × 8
Fig. 1014	. . . . .	10 × 10
Fig. 1015	. . . . .	10 × 10

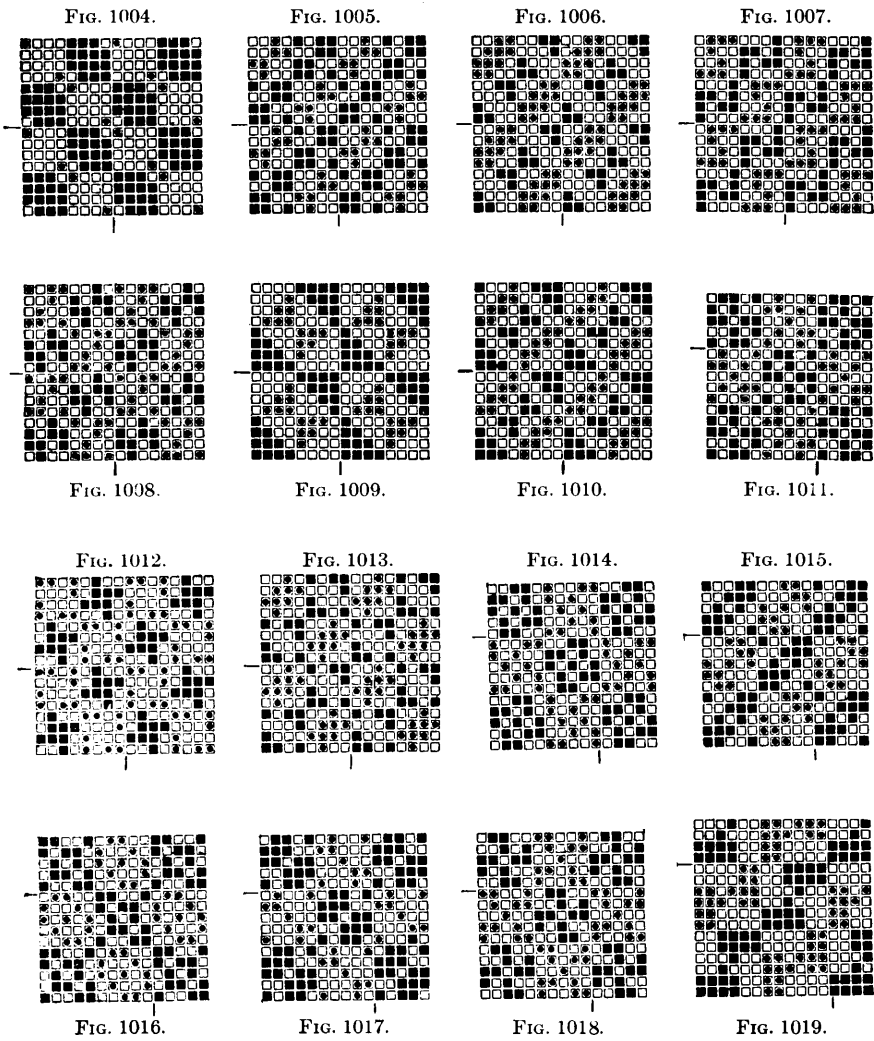
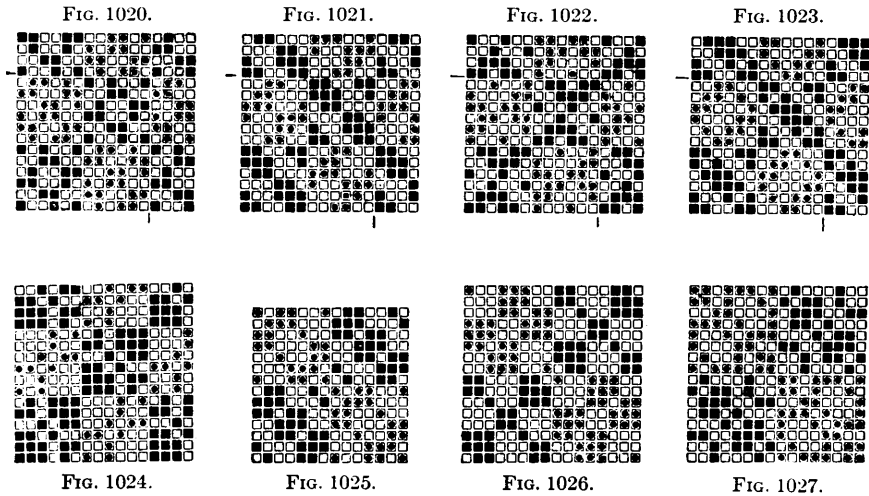


Fig. 1016	. . . . .	10 × 10
Fig. 1017	. . . . .	10 × 10
Fig. 1018	. . . . .	10 × 10
Fig. 1019	. . . . .	12 × 12
Fig. 1020	. . . . .	12 × 12
Fig. 1021	. . . . .	12 × 12
Fig. 1022	. . . . .	12 × 12
Fig. 1023	. . . . .	12 × 12
Fig. 1024	. . . . .	12 × 12
Fig. 1025	. . . . .	14 × 14
Fig. 1026	. . . . .	16 × 16
Fig. 1027	. . . . .	16 × 16

CRÊPE WEAVES BY REARRANGING OTHER WEAVES

Another method of drafting crêpe weaves consists in rearranging the threads of other weaves. A large number of crêpe weaves can be obtained by keeping the general character of the base weave unchanged, but changing the order in which the threads are arranged. The threads are either laid out in a predetermined order on a new draft, or the drawing-in draft is arranged to give the order desired.

Such rearrangements sometimes cause too long a



float of the filling threads, making it necessary to stitch the floats by inserting single points in order that the firmness of the fabric may not be impaired.

CRÊPE WEAVES BY REARRANGEMENT OF THE WARP THREADS

This method of crêpe weave construction is very useful because it enables the designer to combine twill and crêpe stripe effects in the same pattern without any increase in the number of shafts. The ground weave requires a straight drawing-in draft, while the crêpe is obtained by cross drafts. This method of drafting is illustrated at Fig. 1028, which shows four drawing-in drafts (*a*, *b*, *c*, *d*) with the same chain, giving the straight twill (*a*) and three crêpe effects (*b*, *c*, *d*).

In this way many weave effects can be produced in one pattern without an increase in the number of shafts. The method is very useful in weaving different patterns on one pattern warp. Other examples are shown at Figs. 1029 to 1067.

The foundation weave is either drafted at the upper left-hand corner, as at Fig. 1044, or indicated by a formula above the draft, as at Fig. 1029.

Fig. 1029	. . . . .	11 × 11
Fig. 1030	. . . . .	11 × 11
Fig. 1031	. . . . .	11 × 11

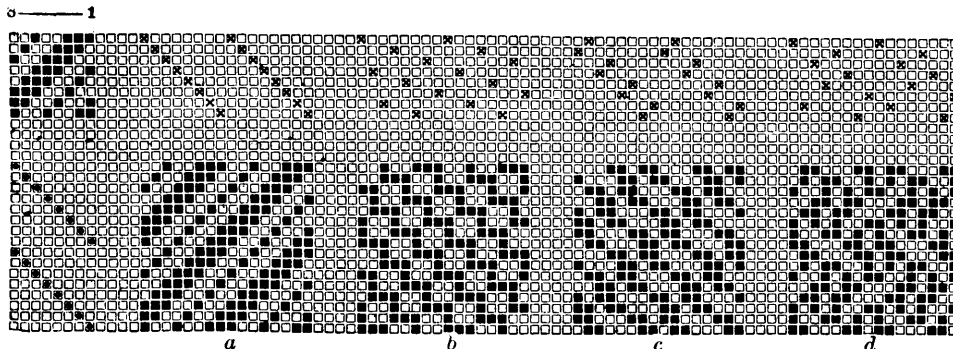


FIG. 1028.

Fig. 1032	. . . . .	12 × 12
Fig. 1033	. . . . .	12 × 12
Fig. 1034	. . . . .	12 × 12
Fig. 1035	. . . . .	14 × 14
Fig. 1036	. . . . .	14 × 14
Fig. 1037	. . . . .	14 × 14
Fig. 1038	. . . . .	16 × 16
Fig. 1039	. . . . .	16 × 16
Fig. 1040	. . . . .	16 × 16
Fig. 1041	. . . . .	16 × 16
Fig. 1042	. . . . .	16 × 16
Fig. 1043	. . . . .	16 × 16
Fig. 1044	. . . . .	8 shafts

FIG. 1029.

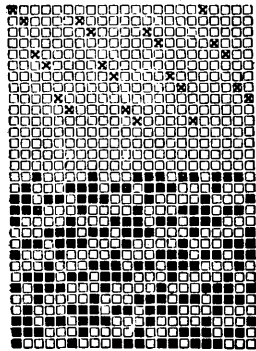
$$\begin{array}{r} 3 \ 1 \ 1 \\ \hline 2 \ 2 \ 2 \end{array}$$


FIG. 1030.

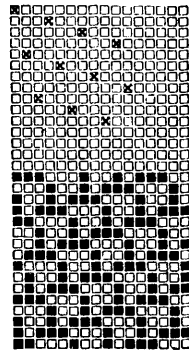
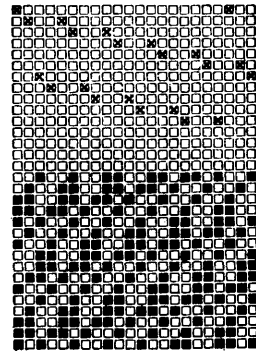
$$\begin{array}{r} 3 \ 1 \ 1 \\ \hline 1 \ 2 \ 3 \end{array}$$


FIG. 1031.

$$\begin{array}{r} 3 \ 1 \ 1 \\ \hline 2 \ 3 \ 1 \end{array}$$


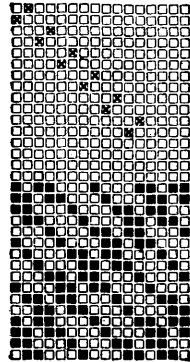
$$\begin{array}{r} 3 \ 1 \ 1 \\ \hline 2 \ 3 \ 2 \end{array}$$


FIG. 1032.

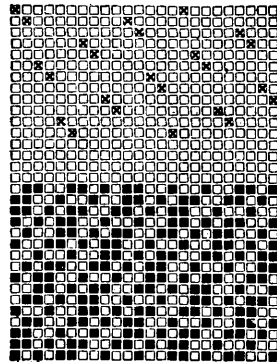
$$\begin{array}{r} 3 \ 1 \ 1 \ 1 \\ \hline 1 \ 2 \ 2 \ 1 \end{array}$$


FIG. 1033.

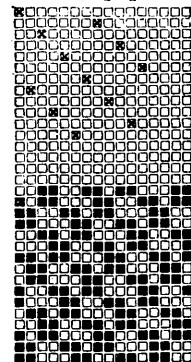
$$\begin{array}{r} 3 \ 2 \ 1 \\ \hline 2 \ 2 \ 2 \end{array}$$


FIG. 1034.

FIG. 1035.

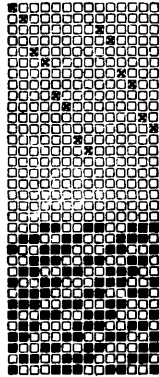
$$\begin{array}{r} 12211 \\ \hline 11122 \end{array}$$


FIG. 1036.

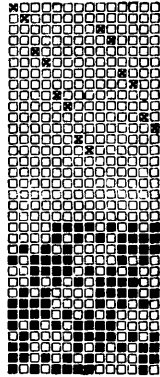
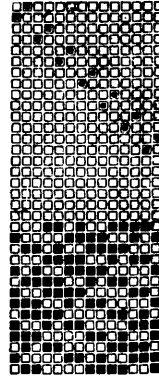
$$\begin{array}{r} 331 \\ \hline 133 \end{array}$$


FIG. 1037.

$$\begin{array}{r} 12211 \\ \hline 11122 \end{array}$$


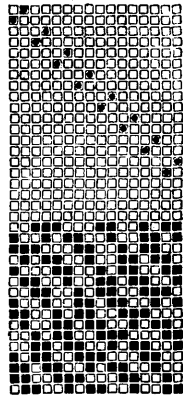
$$\begin{array}{r} 3212 \\ \hline 3212 \end{array}$$


FIG. 1038.

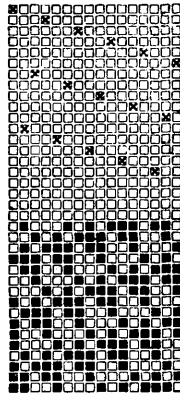
$$\begin{array}{r} 3311 \\ \hline 1133 \end{array}$$


FIG. 1039.

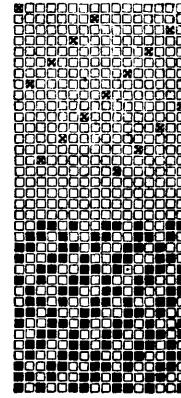
$$\begin{array}{r} 3212 \\ \hline 3212 \end{array}$$


FIG. 1040.

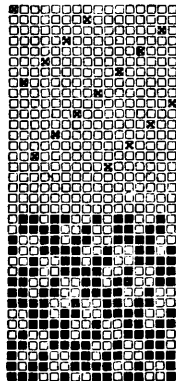
$$\begin{array}{r} 432 \\ \hline 322 \end{array}$$


FIG. 1041.

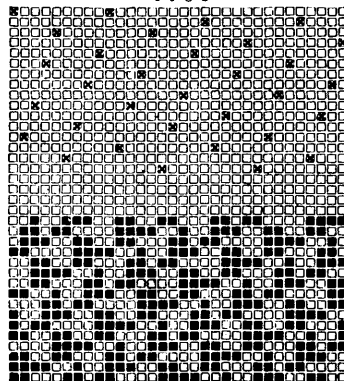
$$\begin{array}{r} 3311 \\ \hline 1133 \end{array}$$


FIG. 1042.

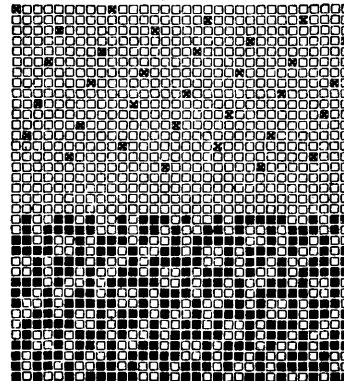
$$\begin{array}{r} 432 \\ \hline 322 \end{array}$$


FIG. 1043.

Fig. 1045	. . . . .	8 shafts
Fig. 1046	. . . . .	8 shafts
Fig. 1047	. . . . .	8 shafts
Fig. 1048	. . . . .	8 shafts
Fig. 1049	. . . . .	8 shafts
Fig. 1050	. . . . .	8 shafts
Fig. 1051	. . . . .	10 shafts

FIG. 1044.

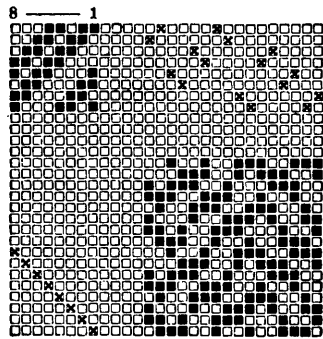


FIG. 1045.

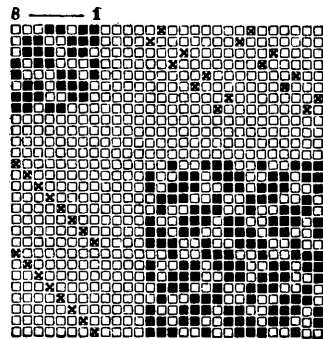
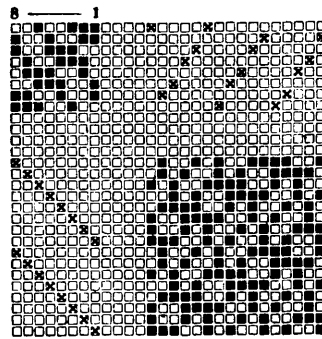


FIG. 1046.

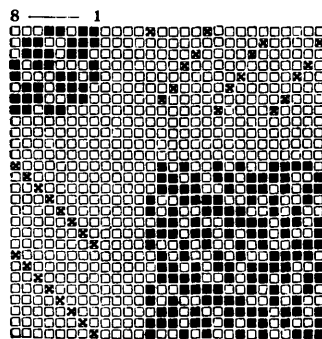


FIG. 1047.

Fig. 1052	. . . . .	8 shafts
Fig. 1053	. . . . .	8 shafts
Fig. 1054	. . . . .	8 shafts
Fig. 1055	. . . . .	8 shafts
Fig. 1056	. . . . .	10 shafts
Fig. 1057	. . . . .	12 shafts
Fig. 1058	. . . . .	12 shafts
Fig. 1059	. . . . .	12 shafts

FIG. 1048.

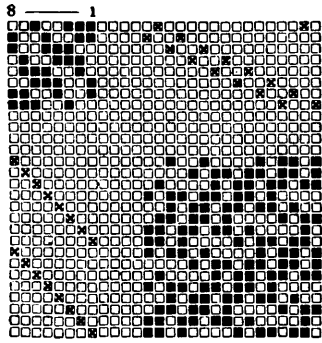
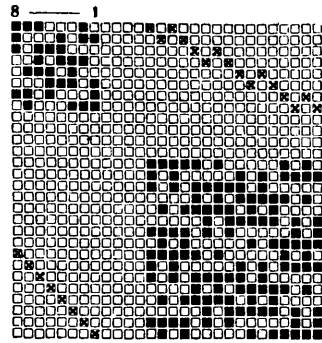


FIG. 1049.



16 ————— 1

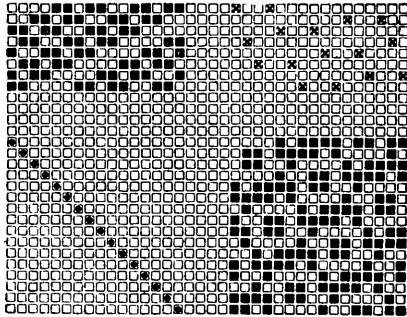


FIG. 1050.

10 ————— 1

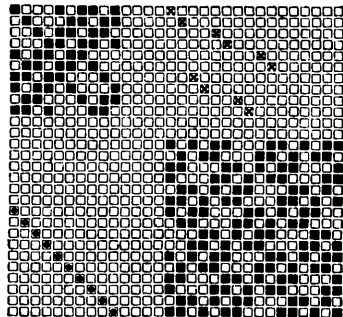


FIG. 1051.

FIG. 1052.

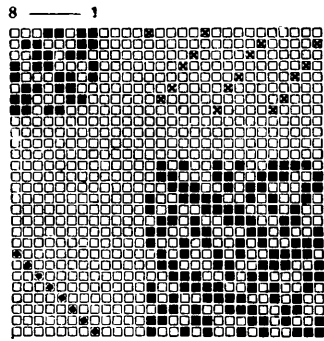
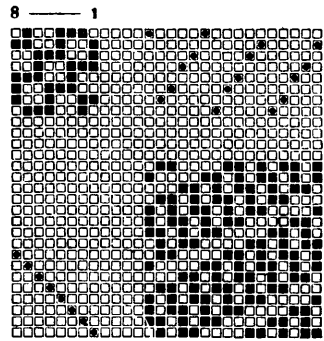


FIG. 1053.



8 ————— 1

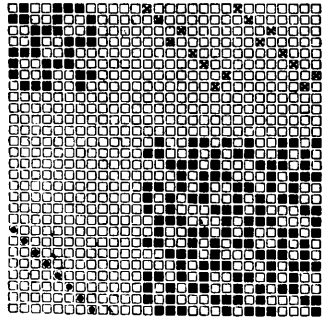


FIG. 1054.

10 ————— 1

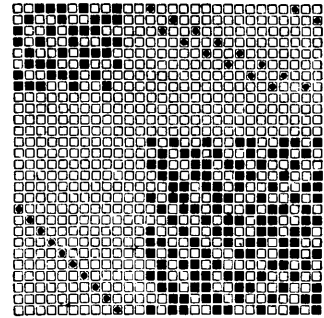


FIG. 1055.

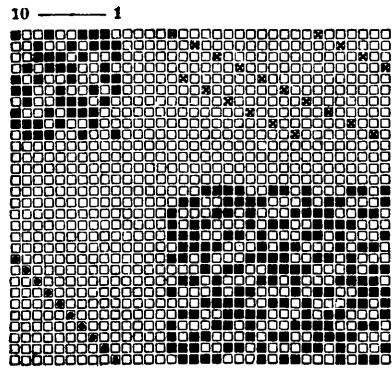


FIG. 1056.

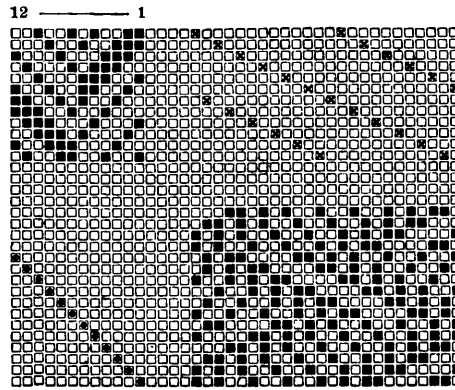


FIG. 1057.

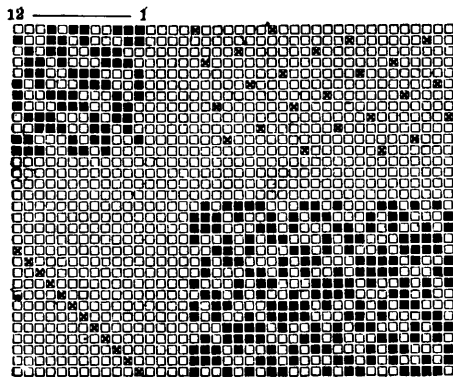


FIG. 1058.

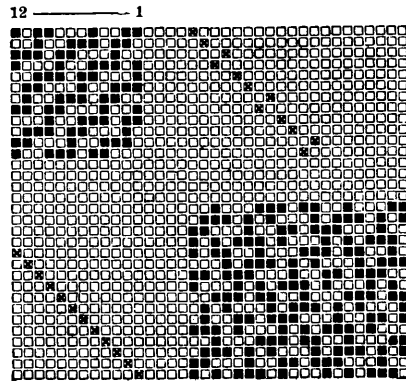


FIG. 1059.

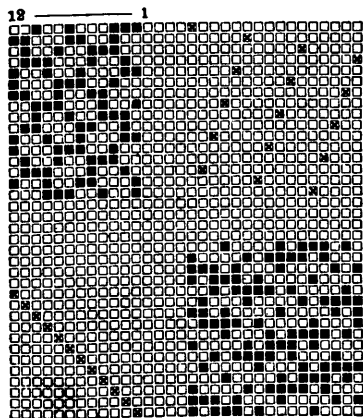


FIG. 1060.

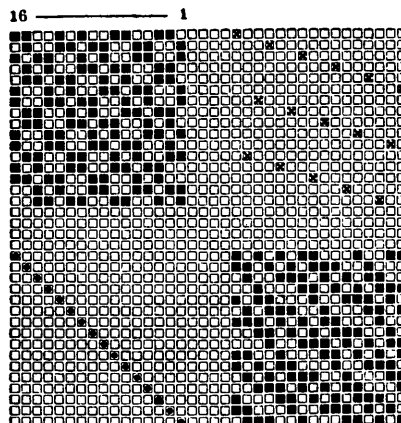


FIG. 1061.

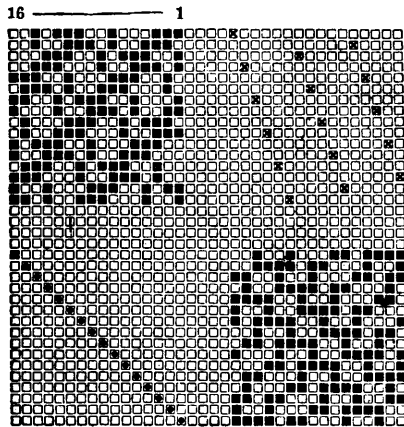


FIG. 1062.

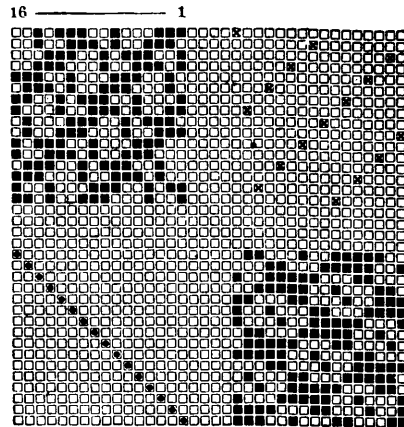


FIG. 1063.

FIG. 1064.

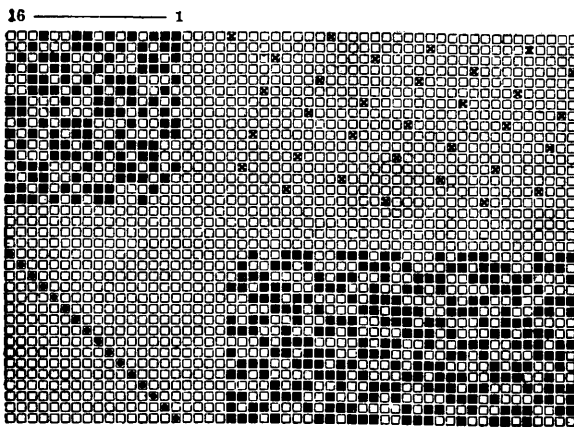
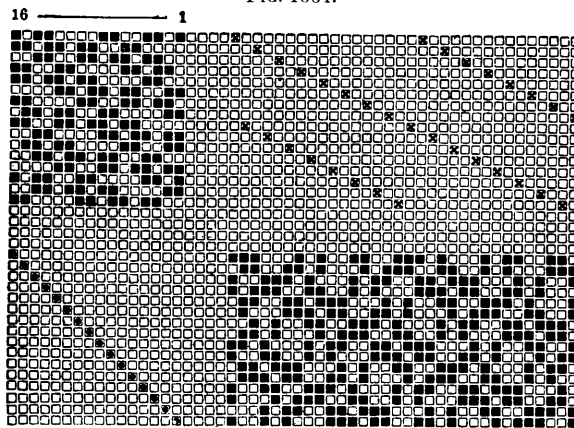


FIG. 1065.

Fig. 1060	. . . . .	16 shafts
Fig. 1061	. . . . .	16 shafts
Fig. 1062	. . . . .	16 shafts
Fig. 1063	. . . . .	16 shafts
Fig. 1064	. . . . .	16 shafts
Fig. 1065	. . . . .	16 shafts
Fig. 1066	. . . . .	8 shafts
Fig. 1067	. . . . .	16 shafts

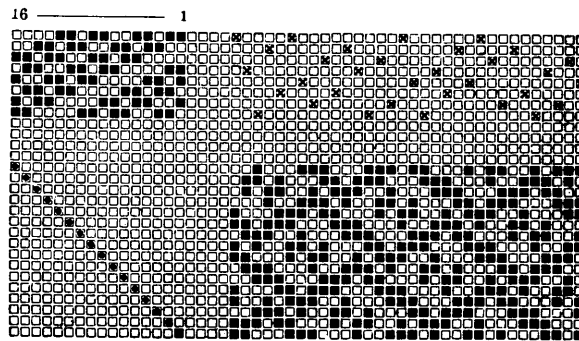


FIG. 1066.

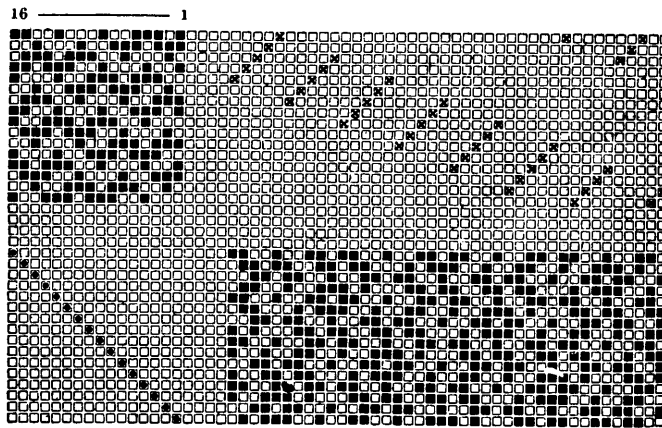


FIG. 1067.

CRÊPE WEAVES BY REARRANGING WARP AND FILLING

Much more interesting are the crêpe weaves produced by rearranging the threads in both warp and filling. This method enables different crêpe weaves

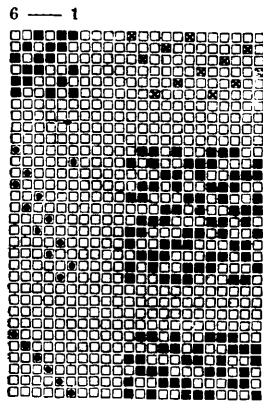


FIG. 1068.

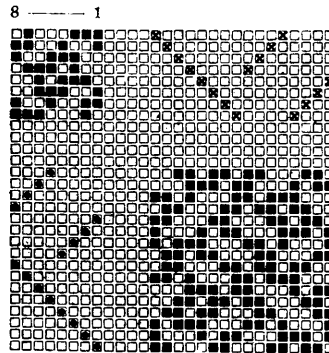


FIG. 1069.

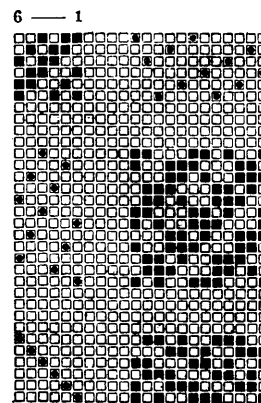


FIG. 1070.

FIG. 1071.

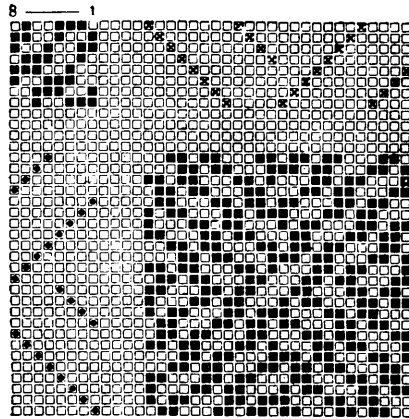


FIG. 1072.

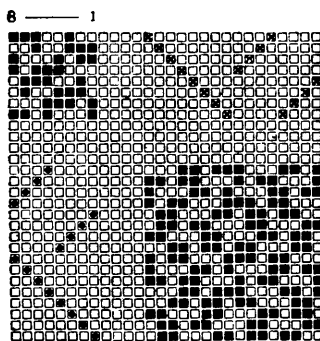
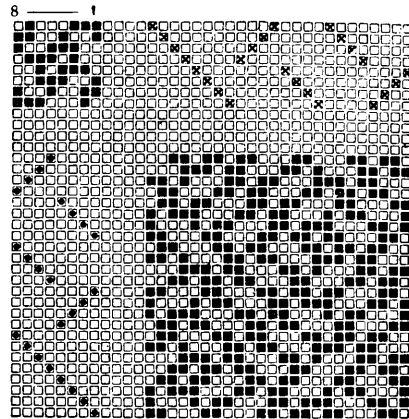


FIG. 1073.

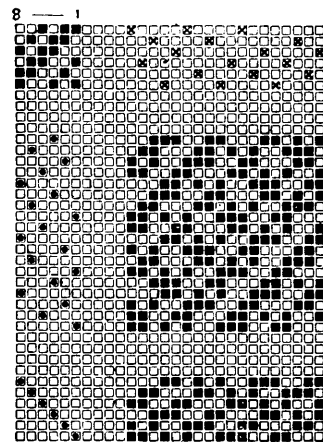


FIG. 1074.

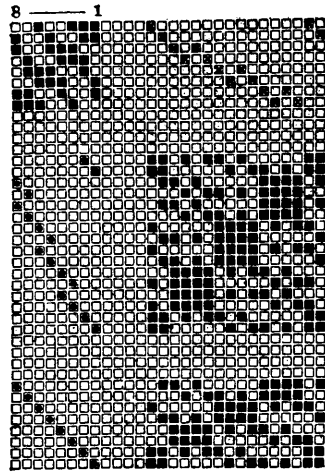


FIG. 1075.

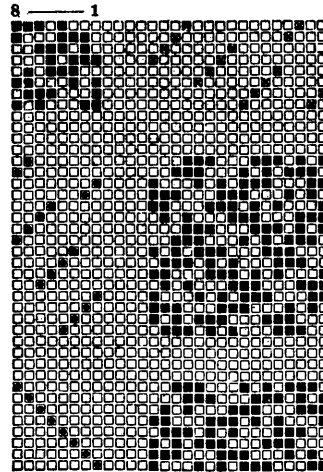


FIG. 1076.

to be produced by changing the position of the filling threads on the same chain without change of the drawing-in draft.

The method of drafting is illustrated at Fig. 1068.

The 6-leaf base weave is shown in the upper left-hand corner. The 6-shaft drawing-in draft appears at the top of the figure. The 12-thread weave resulting from this drawing-in draft is shown at the bottom.

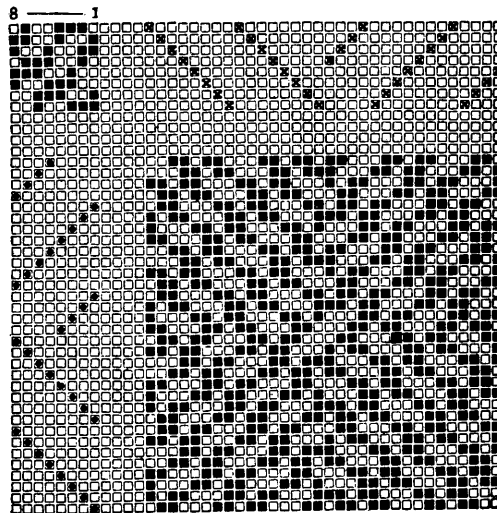


FIG. 1077.

At the left in the lower left-hand corner is the line of points indicating the 6 picks in the 12-thread weave at the bottom. Above this line and at the left side of the figure is given

the order in which these 6 picks of the 12-thread weave are rearranged to produce the crêpe pattern at the right. The rearrangement of the picks is indicated by the method used for drawing-in drafts.

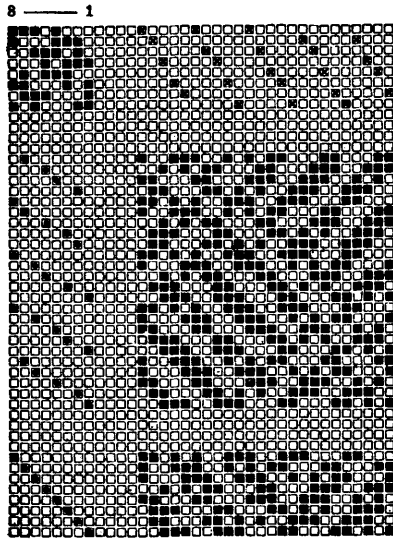


FIG. 1078.

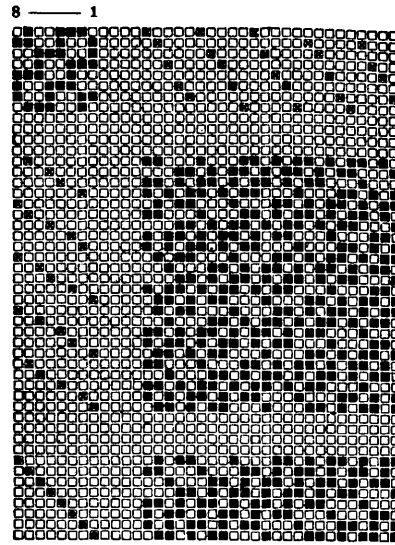


FIG. 1079.

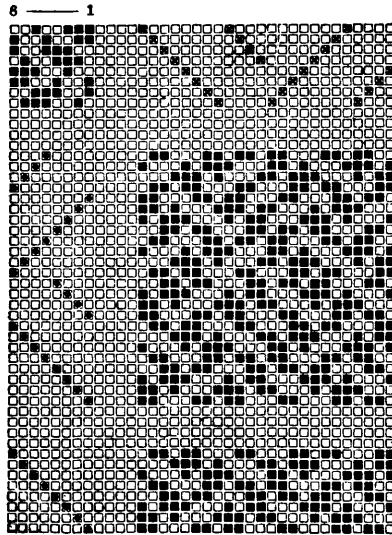


FIG. 1080.

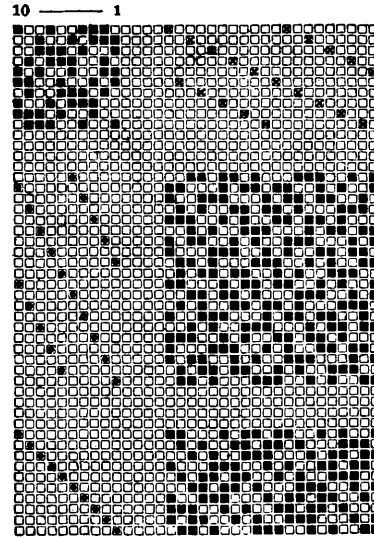


FIG. 1081.

This process of drafting is also illustrated in full in Figs. 1070, 1074, 1075, 1076 and 1078 to 1090. In the other drafts, Figs. 1069, 1071, 1072, 1073 and 1077,

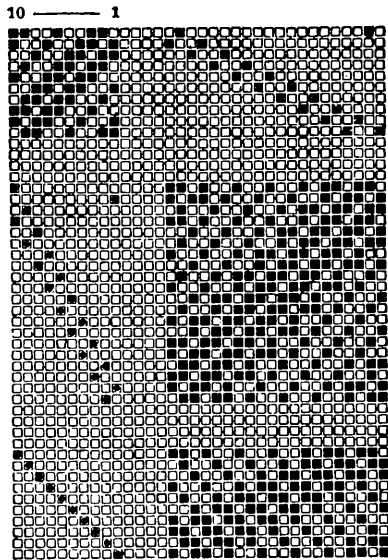


FIG. 1082.

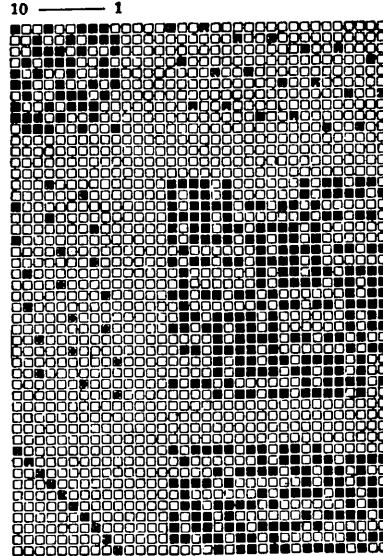


FIG. 1083.

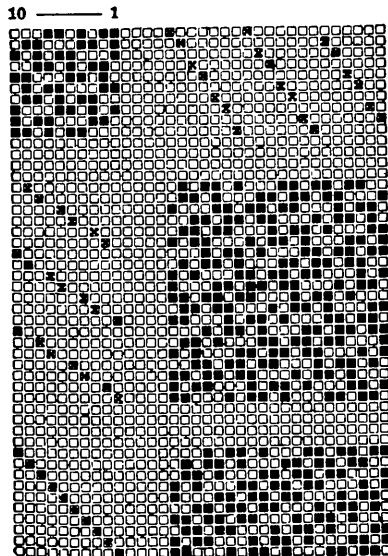


FIG. 1084.

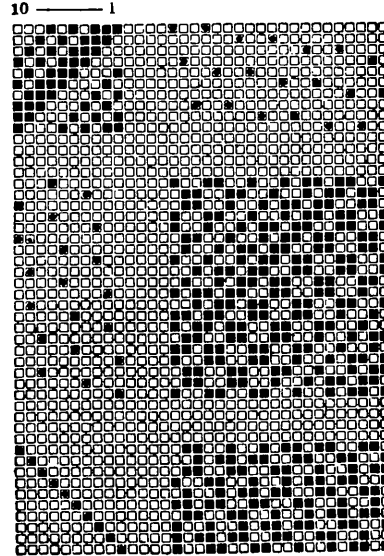


FIG. 1085.

the weave obtained by rearranging the warp only is omitted.

Wide diagonals can be produced in this way with a small number of shafts, as shown at Figs. 1082, 1085, 1086 and 1088.

Fig. 1068	. . . . .	6 shafts
Fig. 1069	. . . . .	8 shafts
Fig. 1070	. . . . .	6 shafts
Fig. 1071	. . . . .	8 shafts
Fig. 1072	. . . . .	8 shafts
Fig. 1073	. . . . .	8 shafts
Fig. 1074	. . . . .	6 shafts
Fig. 1075	. . . . .	8 shafts
Fig. 1076	. . . . .	8 shafts
Fig. 1077	. . . . .	8 shafts
Fig. 1078	. . . . .	8 shafts
Fig. 1079	. . . . .	8 shafts
Fig. 1080	. . . . .	8 shafts

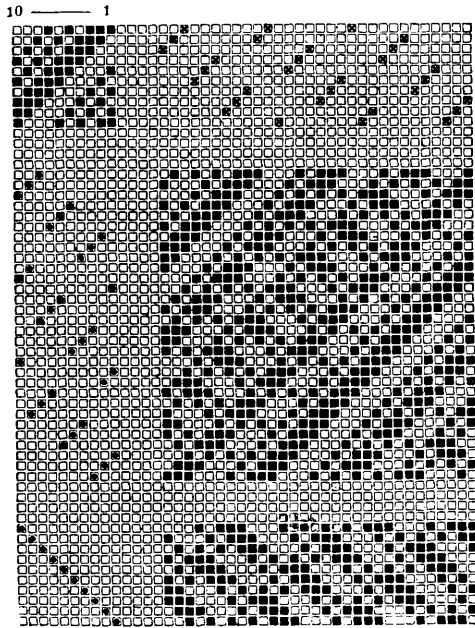


Fig. 1086.

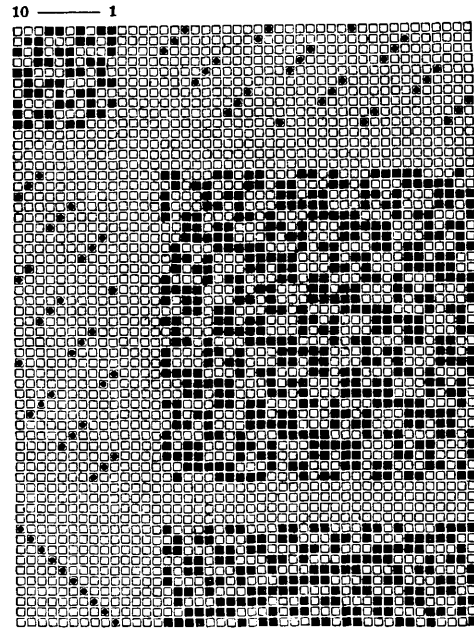


Fig. 1087.

Fig. 1081	. . . . .	10 shafts
Fig. 1082	. . . . .	10 shafts
Fig. 1083	. . . . .	10 shafts
Fig. 1084	. . . . .	10 shafts

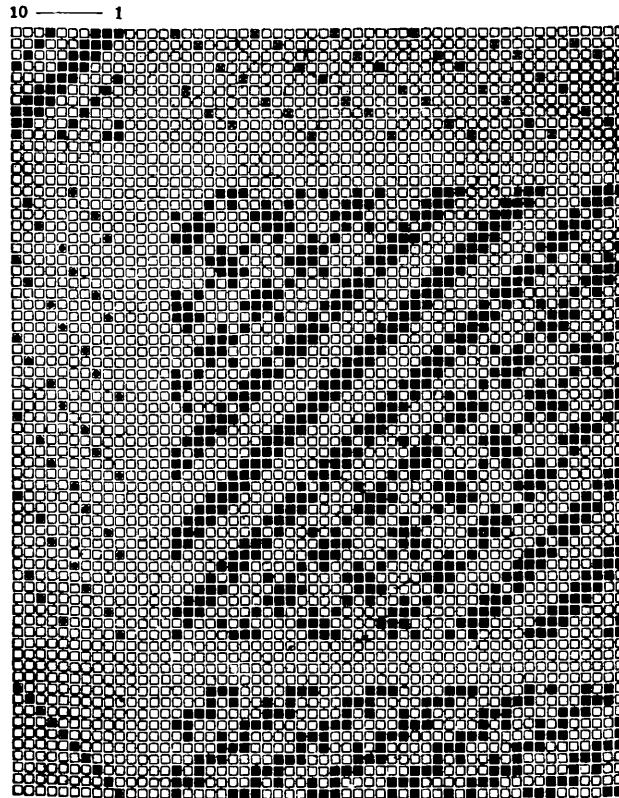


FIG. 1088.

Fig. 1085	. . . . .	10 shafts
Fig. 1086	. . . . .	10 shafts
Fig. 1087	. . . . .	10 shafts
Fig. 1088	. . . . .	10 shafts
Fig. 1089	. . . . .	10 shafts
Fig. 1090	. . . . .	16 shafts

**CRÊPE WEAVES WITH GROUPS OF THREADS ON THE
SAME SHAFT**

Another method of constructing crêpe weaves consists in drawing a number of threads, each on a different shaft, as 1, 2, 3, 4, and then drawing two or more

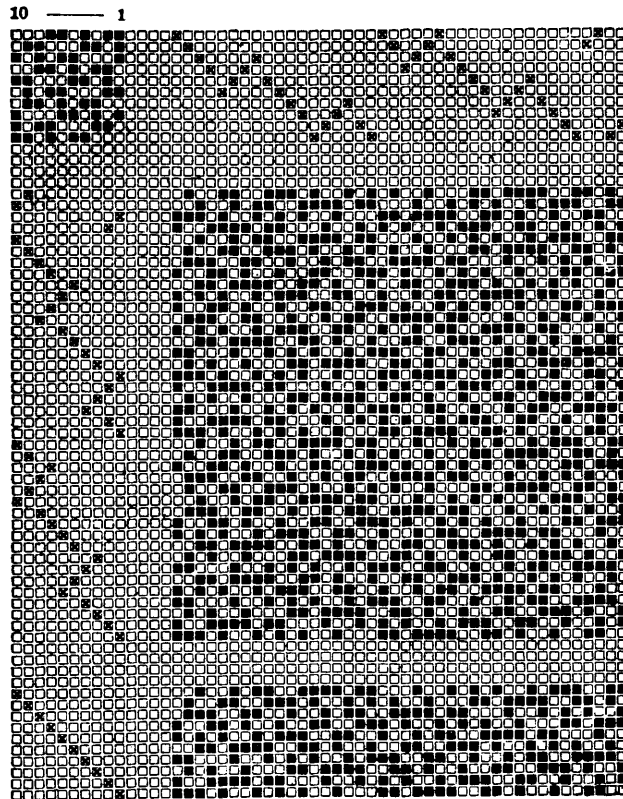


FIG. 1089.

threads on the same shaft. These groups are so arranged that the whole number of shafts is not divisible by the number of threads in the groups. For example, with 8 or 10 shafts the threads may be drawn in 2 single 1 double, total 3 shafts, or 1 single 2 double, total 3 shafts.

The object of this arrangement is to distribute the

double threads uniformly on all the different shafts. As neither 10 nor 8 is divisible by 3 it follows that the double threads will come on a different shaft at each passage of the drawing-in draft across the shafts, until

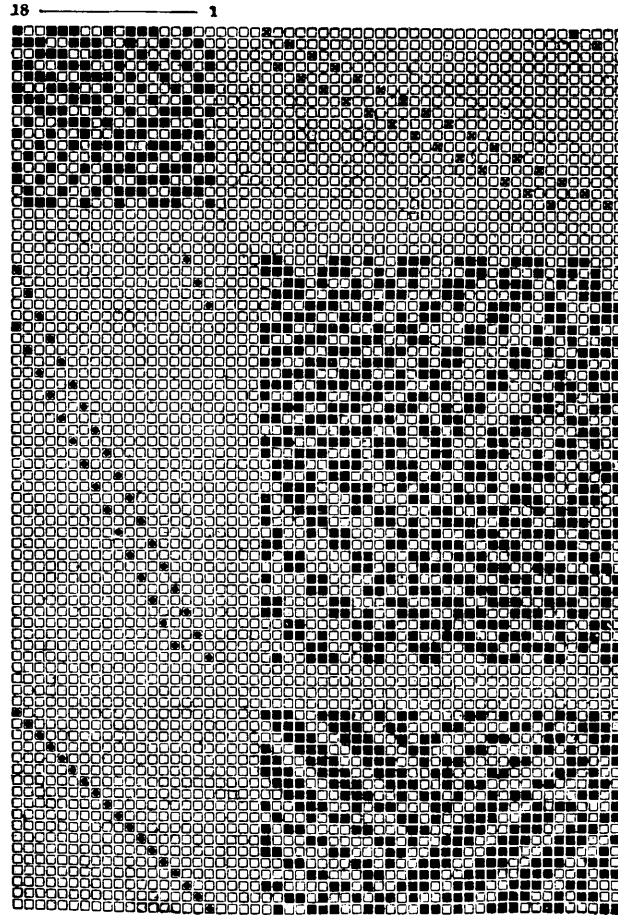


FIG. 1090.

every shaft carries a double thread, when the pattern is complete. The same rule is followed in the filling.

This method is illustrated at Figs. 1091 to 1094, in each of which the weave pattern resulting from the rearrangement of the warp threads only is shown at the bottom of the figure.

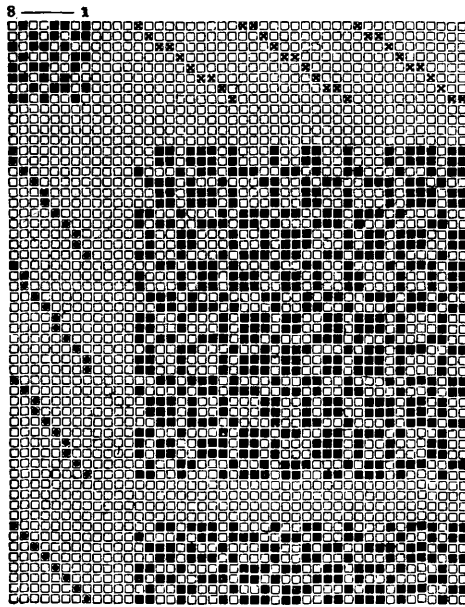


FIG. 1091.

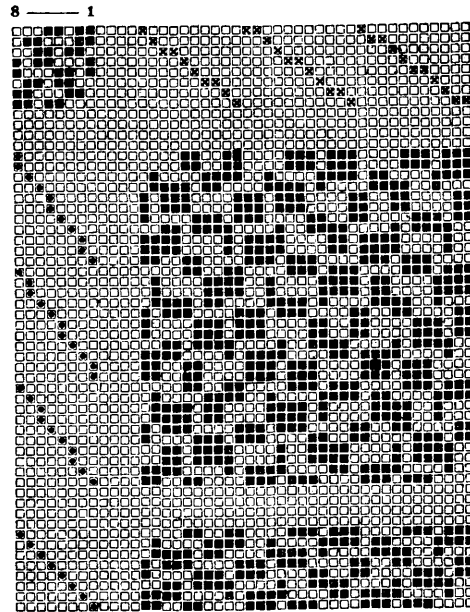


FIG. 1092.

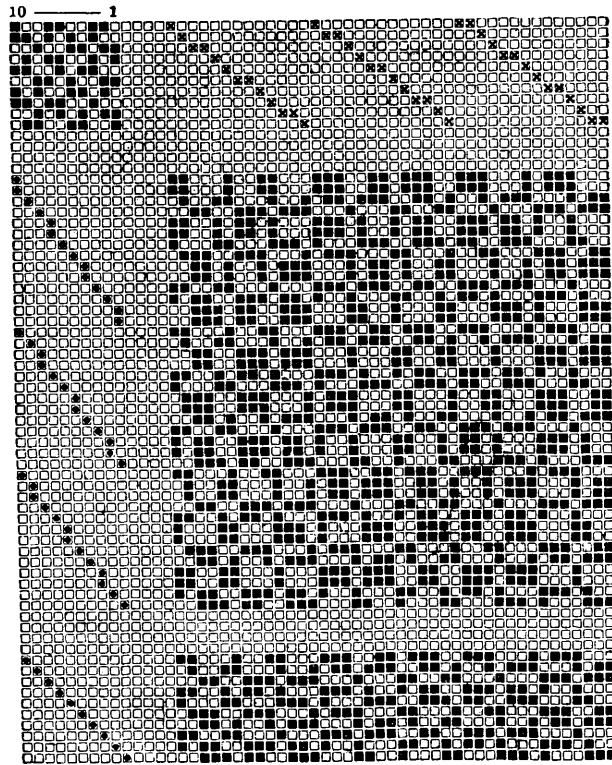


FIG. 1093.

From this draft the completed pattern, shown at the right of the figure is obtained by a similar rearrangement of the picks.

- Fig. 1091 8 shafts
- Fig. 1092 8 shafts
- Fig. 1093 10 shafts
- Fig. 1094 8 shafts

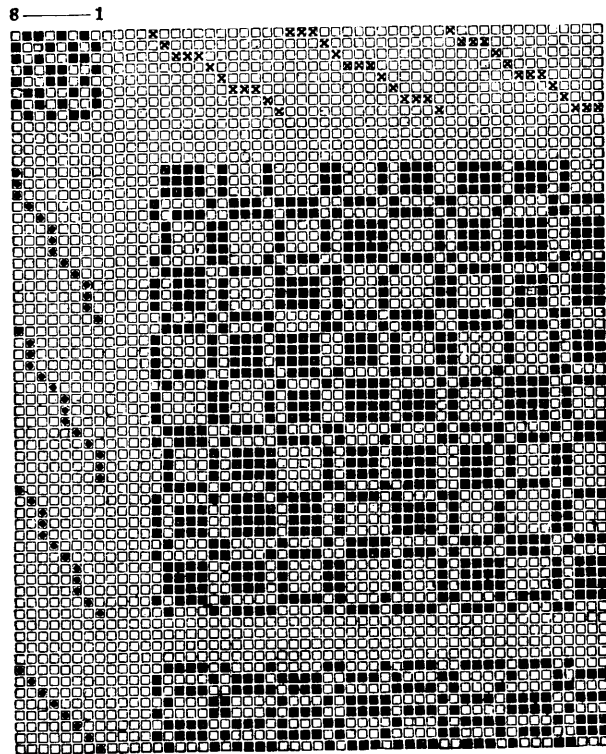


FIG. 1094.

CRÊPE BY INTERLOCKING A WEAVE WITH ITS REVERSE

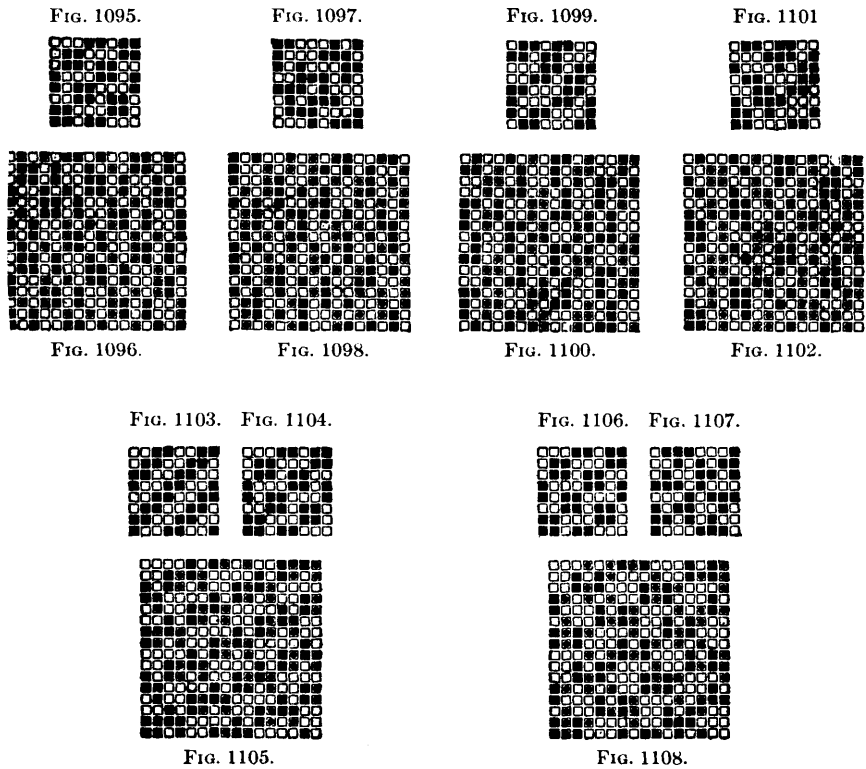
This method consists in transferring the ground weave to a draft in which one or more warp threads are left blank at fixed intervals, the ground weave being sketched on the others. The blank threads are then filled in by inserting risers where sinkers are found at one side. If the blank threads are single, each one

is drafted to break with the thread either to the right or left. In Figs. 1096 and 1098 the break is made with the thread at the left. The ground weaves for Figs. 1096 and 1098 are shown at Figs. 1095 and 1097.

If the blank threads occur in pairs, the left-hand thread of each pair breaks with the regular thread at the left and the right-hand thread breaks with the regular thread at the right, Figs. 1100 and 1102. The ground weaves for Figs. 1100 and 1102 are shown at Figs. 1099 and 1101.

CRÊPE BY INTERLOCKING TWO WEAVES

Crêpe effects can be obtained by interlocking two weaves. Fig. 1105 is the weave obtained by interlocking a twill, Fig. 1103, and a crêpe, Fig. 1104. Fig. 1108 is derived from two crêpe weaves, Figs. 1106



and 1107. Other examples will be found under the head of Interlocking Weaves.

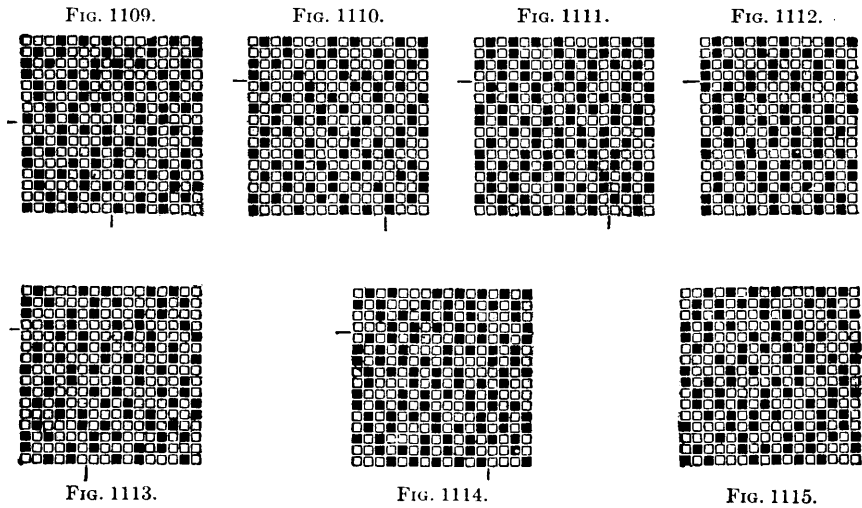
RIB CRÊPE

This form of crêpe weave results from the removal of single points at regular intervals from a $2-2$ or $3-3$ rib weave. When the riser is removed the filling floats over three warp threads, Figs. 1109 to 1115.

Fig. 1109	. . . . .	8 × 8
Fig. 1110	. . . . .	12 × 12
Fig. 1111	. . . . .	12 × 12
Fig. 1112	. . . . .	14 × 12
Fig. 1113	. . . . .	6 × 12
Fig. 1114	. . . . .	12 × 12
Fig. 1115	. . . . .	16 × 16

CRÊPE WEAVES BY DRAFTING ONE WEAVE OVER ANOTHER

Crêpe effects can be obtained by superimposing one weave on another in the same draft. A weave is first sketched and then another is drafted over it without removing any of the risers of the first. For example, one twill is set over another, the two twills running in opposite directions. Or a satin may be



sketched on a satin, the two weaves having a different number of threads. This method is used but little owing to the small number of good effects obtainable.

Fig. 1116	. . . . .	8 × 8
Fig. 1117	. . . . .	8 × 8
Fig. 1118	. . . . .	8 × 8
Fig. 1119	. . . . .	8 × 8
Fig. 1120	. . . . .	12 × 12
Fig. 1121	. . . . .	12 × 12
Fig. 1122	. . . . .	12 × 12
Fig. 1123	. . . . .	12 × 12
Fig. 1124	. . . . .	12 × 12
Fig. 1125	. . . . .	16 × 16

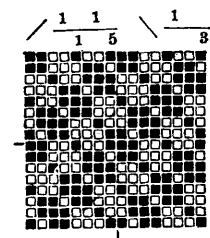
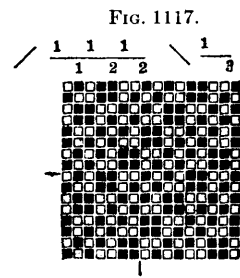
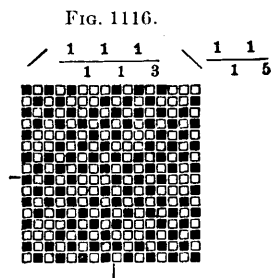


FIG. 1118.

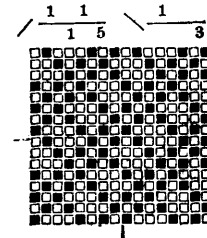


FIG. 1119.

The formulas for the two twills, with slanting lines to indicate the direction of the twill line, are shown above each combination weave, Figs. 1116 to 1125.

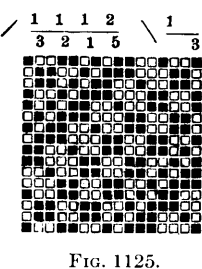
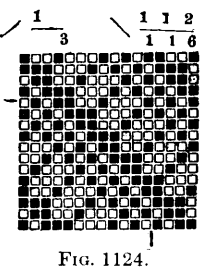
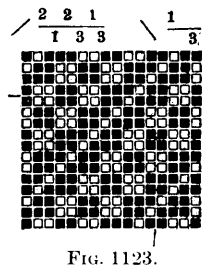
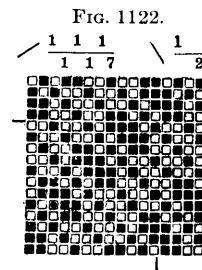
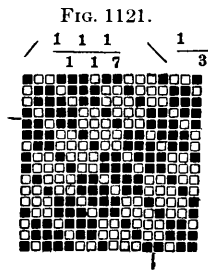
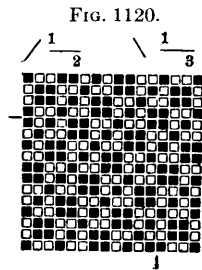
CRÊPE WEAVES BY DRAFTING A WEAVE IN FOUR SQUARES

This method consists in drafting a weave on alternate warp and filling threads, then turning the founda-

tion weave draft quarter way around and transferring it in this position to alternate warp and filling threads of a new draft, repeating the process for each of the other two positions.

Each of the two sets of alternate warp and filling threads receives two of the transferred weaves. This method is illustrated at Figs. 1126 to 1130. Fig. 1130 is the completed crêpe weave derived from a $2\text{---}2$ twill.

The twill is transferred to the first set of alternate warp and filling threads of the draft, Fig. 1126.



The 4-leaf twill is next turned one-quarter way round and transferred in this position, to the second set of alternate warp and filling threads of Fig. 1127.

Another quarter turn and a transfer gives the twill shown at Fig. 1128.

The twill is again turned one-quarter way around and transferred to Fig. 1129.

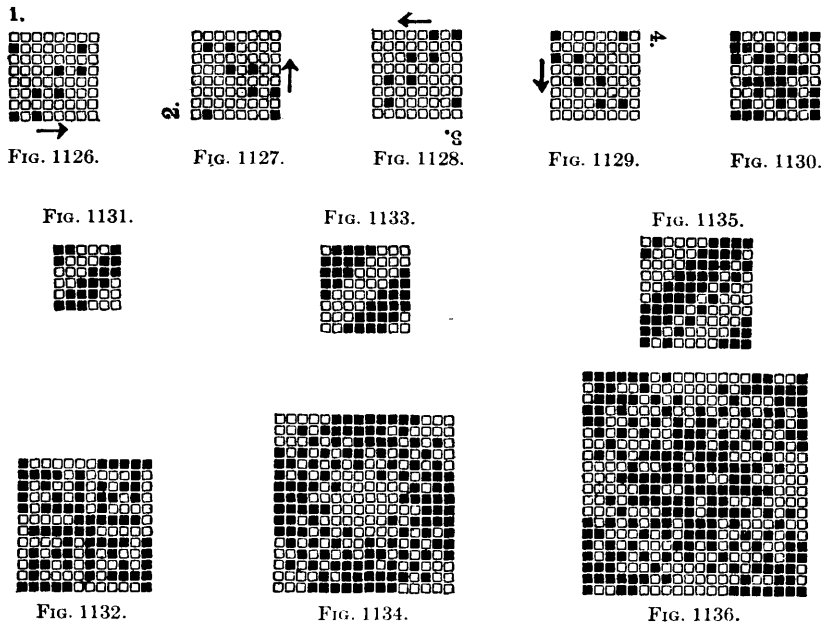
These four transfers are shown on four separate drafts, Figs. 1126, 1127, 1128 and 1129, for the sake of clearness. They are in fact transferred to the same draft, making the crêpe weave shown at Fig. 1130.

The operation is made easier by using ink of a different color for each transfer.

Other examples of this method are shown at Figs. 1132, 1134 and 1136, which are derived from Figs. 1131, 1133 and 1135 respectively.

A variation of the method consists in reversing the ground weave for two of the transfers, making the sinkers risers.

This completes the study of crêpe weaves. Methods for the production of an unlimited number of effects have been described and illustrated by several hundred weave patterns: Designing these effects requires not only imagination for the conception of new ideas, but also skill in drafting and the ability to determine in advance what effect the weave will have in the goods.



REFORM WEAVES WITH WARP THREADS AL- TERNATING ON FACE AND BACK

A firmer texture is obtained when each warp thread is transferred at regular intervals alternately to the face and back. The threads when on the face may

FIG. 1137.



FIG. 1139.



FIG. 1141.

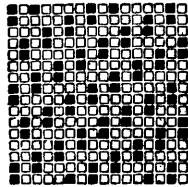


FIG. 1138.

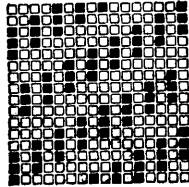


FIG. 1140.

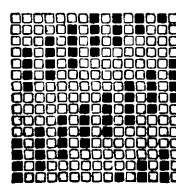


FIG. 1142.

FIG. 1143.



FIG. 1145.



FIG. 1147.

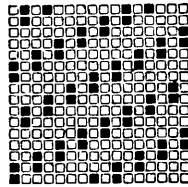


FIG. 1144.

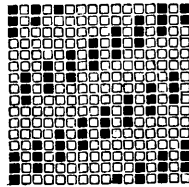


FIG. 1146.

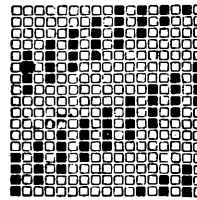


FIG. 1148.

be woven with a twill, satin or other weave, while they float under the filling when on the back. These are sometimes called reform weaves.

The advantage of such a method as compared with

the use of separate sets of threads for the face and back warp are :

1. Greater durability.
2. Uniform take-up.
3. Imperfections in the yarn are less apparent.

FIG. 1149.



FIG. 1151.



FIG. 1153.

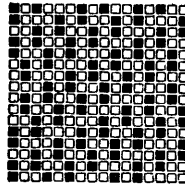


FIG. 1150.

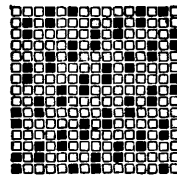


FIG. 1152.

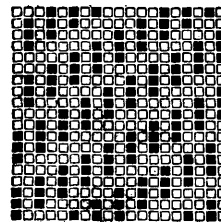


FIG. 1154.

FIG. 1155.



FIG. 1157.



FIG. 1159.

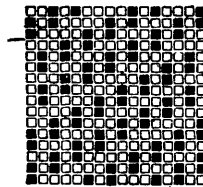


FIG. 1156.

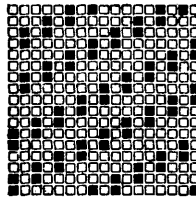


FIG. 1158.

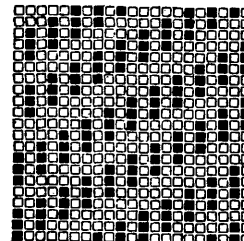


FIG. 1160.

Reform weaves were used at first for ladies' dress goods, vestings and similar fabrics, but frequently in the reverse order, that is, with the warp floating on the face and stitched on the back. In recent years they have also been used for men's wear worsteds.

Each thread passes to the face and back at regular intervals. When warp threads 1, 3, 5, 7, etc., form a face twill, threads 2, 4, 6, 8, etc., float on the back; when threads 2, 4, 6, 8, etc., form the face twill, threads

1, 3, 5, 7, etc., float on the back. As a result of this arrangement, two adjacent warp threads are required for each thread line of the weave on the face.

Following are the rules for constructing the weaves of this class :

REFORM WEAVES IN WHICH THE WARP IS 1 FACE 1 BACK

1. If the weave is an ordinary twill in which the twill line rises one pick at each thread, the number of threads in the pattern is either one more or one less than double the number in the ground weave. Thus, for an 8-shaft twill, 15 or 17 threads are required.

FIG. 1161.



FIG. 1163.

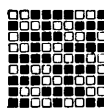


FIG. 1165.

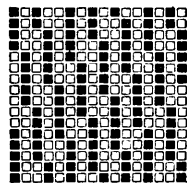
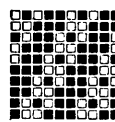


FIG. 1162.

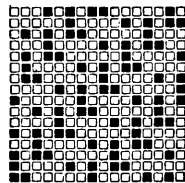


FIG. 1164.

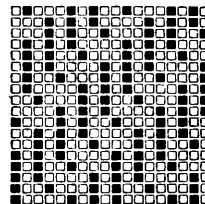


FIG. 1166.

A twill is first marked on threads 1, 3, 5, 7, etc.

If the weave pattern covers one less than double the number of threads in the ground weave, the second twill is placed on threads 2, 4, 6, 8, etc., as far above the twill of the adjacent thread as there are threads in the ground weave. Examples are shown at Figs. 1138, 1140 and 1142, the ground weaves being given at Figs. 1137, 1139 and 1141 respectively.

Fig. 1138 is a reform weave made by drafting a 4-leaf twill, Fig. 1137, on 7 threads, the twill line rising 4 picks at every warp thread. Fig. 1140 is a 6-leaf twill, Fig. 1139, drafted on 11 threads, the twill line rising 6 picks at a time. Fig. 1142 is an 8-leaf twill,

Fig. 1141, drafted on 15 threads, the twill line rising 8 picks at each warp thread.

If the weave pattern contains one more than double the number of threads in the ground weave, the second twill is placed one more than the number of threads in the ground weave above the twill on the adjacent thread :

For a 4-leaf twill on 9 threads, 5 picks higher, Figs. 1143 and 1144 ;

For a 6-leaf twill on 13 threads, 7 picks higher, Figs. 1145 and 1146 ;

For an 8-leaf twill on 17 threads, 9 picks higher, Figs. 1147 and 1148.

2. If each warp thread is brought to the face to form two twill lines while the adjacent thread is float-

FIG. 1167.



FIG. 1169.



FIG. 1171.

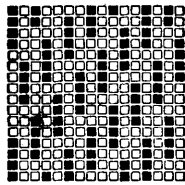


FIG. 1168.

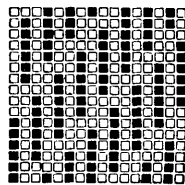


FIG. 1170.

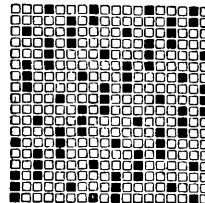


FIG. 1172.

FIG. 1173.



FIG. 1175.



FIG. 1177.



FIG. 1179.

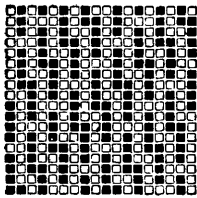


FIG. 1174.

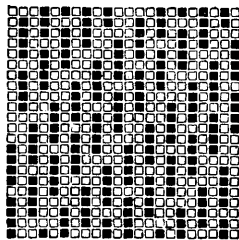


FIG. 1176.

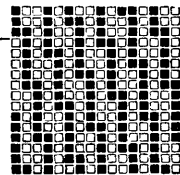


FIG. 1178.

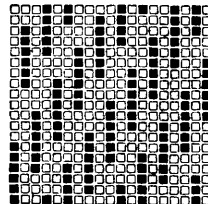


FIG. 1180.

ing on the back, the threads in the pattern must number one less or one more than four times the number in the ground weave; for a 4-leaf twill, 15 or 17 threads; for a 6-leaf twill, 23 or 25 threads.

If there is one thread less than four times the ground weave, the twill on the adjacent thread is placed twice as many picks above the corresponding twill on the preceding thread as there are threads in the ground weave:

For a 3-leaf twill on 11 threads, 6 picks higher, Figs. 1149 and 1150;

For a 4-leaf twill on 15 threads, 8 picks higher, Figs. 1151 and 1152;

FIG. 1181.



FIG. 1183.



FIG. 1185.

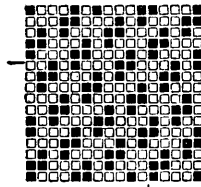


FIG. 1182.

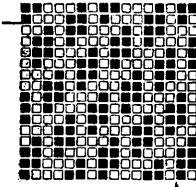


FIG. 1184.

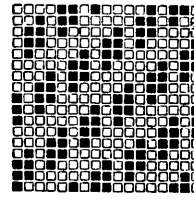


FIG. 1186.

For a 5-leaf twill on 19 threads, 10 picks higher, Figs. 1153 and 1154.

If the reform weave covers one thread more than four times the number of threads in the ground weave, the twill on each thread is placed one more than double the number of threads in the ground weave above the corresponding twill on the preceding thread.

For a 3-leaf twill on 13 threads, 7 picks higher, Figs. 1155 and 1156;

For a 4-leaf twill on 17 threads, 9 picks higher, Figs. 1157 and 1158;

For a 5-leaf twill on 21 threads, 11 picks higher, Figs. 1159 and 1160.

3. For satin weaves in which the rising number is 2

(for example, 5 or 7 shaft satins), likewise for steep twills in which the twill on each warp thread rises two filling threads above the twill on the preceding warp thread, the number of threads in the reform weave is either 2 more or 2 less than double the number of threads in the ground weave; thus, for a 7-shaft ground weave, 12 or 16 threads, instead of 14 threads.

If the reform weave has two threads less than double the number of threads in the ground weave, the twill is raised on each warp thread as far above the twill of

FIG. 1187.



FIG. 1189.



FIG. 1191.

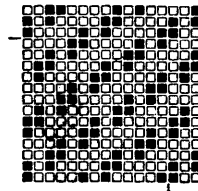


FIG. 1188.

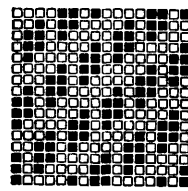


FIG. 1190.

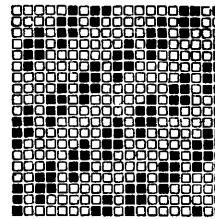


FIG. 1192.

the preceding warp thread as there are threads in the ground weave :

For a 7-shaft weave on 12 threads, 7 picks higher, Figs. 1161 and 1162 ;

For a 9-shaft weave on 16 threads, 9 picks higher, Figs. 1163 and 1164 ;

For a steep twill with 5 threads and 10 picks on a reform weave with 9 threads and 18 picks, 10 picks higher, Figs. 1165 and 1166.

If the reform weave has two threads more than double the number of threads in the ground weave, the twill is set two picks more than the number of threads in the ground weave above the twill on the preceding thread :

For a 5-leaf satin on 12 threads, 7 picks higher, Figs. 1167 and 1168 ;

For a 7-leaf satin on 16 threads, 9 picks higher, Figs. 1169 and 1170 ;

For a steep twill with 4 threads and 8 picks, on a reform weave with 9 threads and 18 picks, 10 picks higher, Figs. 1171 and 1172.

FIG. 1193.



FIG. 1195.

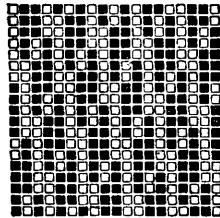


FIG. 1194.

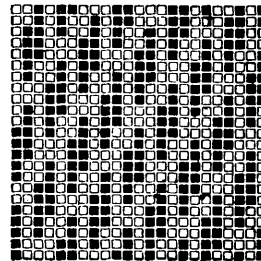


FIG. 1196.

FIG. 1197.



FIG. 1199.

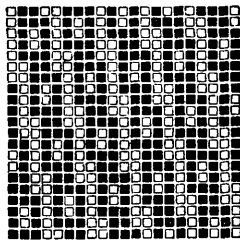
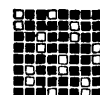


FIG. 1198.

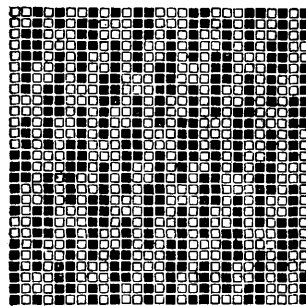


FIG. 1200.

4. If each warp thread of a satin weave is brought to the face twice in succession before the adjacent thread is raised, the reform weave will cover either two threads less or two more than four times the number of threads in the ground weave :

A 5-shaft ground weave will cover 18 or 22 threads in the reform weave.

If the reform weave has two less than four times the number of threads in the ground weave, the twill is raised at each warp thread twice as many picks as there are threads in the ground weave :

For a 5-leaf satin on 18 threads, 10 picks higher, Figs. 1173 and 1174.

If the reform weave has two more than four times the number of threads in the ground weave, the twill

Fig. 1201.



Fig. 1203.

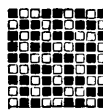


Fig. 1205.

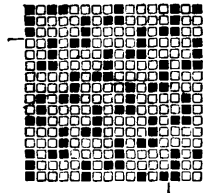
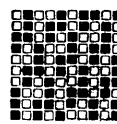


Fig. 1202.

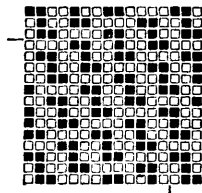


Fig. 1204.

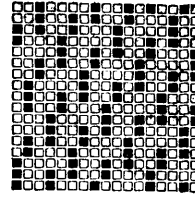


Fig. 1206.

is raised at each warp thread two more than double the number of threads in the ground weave :

For a 5-leaf satin on 22 threads, 12 picks higher, Figs. 1175 and 1176.

5. For ground weaves in which the rising number is 3, such as an 8- or a 10-shaft satin, the threads in the reform weave number three more or three less than double the number of threads in the ground weave. Thus an 8-shaft ground weave would have either 13 or 19 threads in the reform weave.

For an 8-shaft steep twill of this kind on 13 threads, the rising number in the reform weave is 8, equal to the number of threads in the ground weave, Figs. 1177 and 1178.

For the same 8-shaft steep twill on 19 threads, the rising number in the reform weave is 11, which is 3

more than the number of threads in the ground weave, Figs. 1179 and 1180.

Where the warp threads float for a considerable distance on the back, they are frequently stitched by raising a warp thread over 1 pick, at a point where there is a raised thread at each side of the stitched thread.

FIG. 1207.

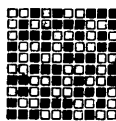


FIG. 1209.

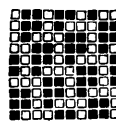


FIG. 1211.

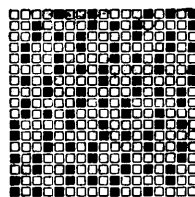
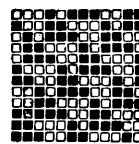


FIG. 1208.

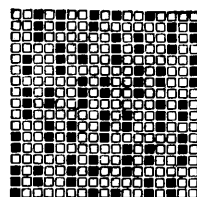


FIG. 1210.

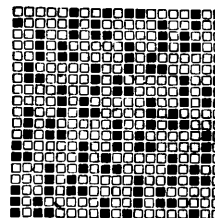


FIG. 1212.

REFORM WEAVES WITH TWO THREADS ON THE FACE FOR ONE ON THE BACK

To make the face closer, reform weaves are sometimes arranged to bring two threads to the face for each one on the back. They are constructed according to the following rules:

1. The pattern covers either one more or one less than three times the number of threads in the ground weave. Three twills are thus formed in one pattern.

If the weave covers one thread less than three times the ground weave, the rising number is double the number of threads in the ground weave:

For a 4-shaft twill on 11 threads, 8 picks higher, Figs. 1181 and 1182;

For a 5-shaft twill on 14 threads, 10 picks higher, Figs. 1183 and 1184;

For a 6-shaft twill on 17 threads, 12 picks higher, Figs. 1185 and 1186.

If the threads in the pattern number one more than three times those in the ground weave, the rising number is one more than the number of threads in the ground weave.

For a 4-shaft twill on 13 threads, 5 picks higher, Figs. 1187 and 1188.

For a 5-shaft twill on 16 threads, 6 picks higher, Figs. 1189 and 1190.

For a 6-shaft twill on 19 threads, 7 picks higher, Figs. 1191 and 1192.

FIG. 1213.

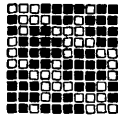


FIG. 1215.

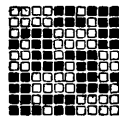


FIG. 1217.

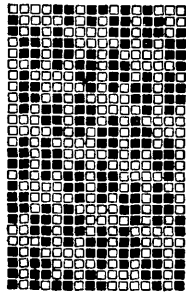
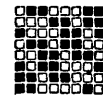


FIG. 1214.

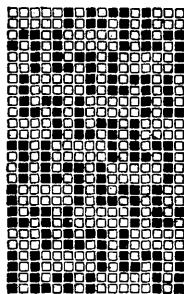


FIG. 1216.

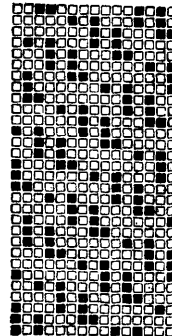


FIG. 1218.

2. With 2 for the rising number in a steep twill or satin weave forming the ground weave, the reform pattern covers either two less or two more than three times the number of threads in that weave; thus, for a 7-shaft weave, either 19 or 23 threads.

If the reform weave has two less than three times the number of threads in the ground weave, the rising number in the reform weave is double the number of threads in the ground weave:

For a 7-shaft steep twill on 19 threads, 14 picks higher, Figs. 1193 and 1194.

If the reform weave has two more than three times

the number of threads in the ground weave, the twill on each warp thread is set two picks more than the number of threads in the ground weave above the corresponding twill on the preceding thread :

For the same 7-shaft steep twill, Fig. 1193, on 23 threads, the twill rises 9 picks at each thread, Figs. 1195 and 1196.

3. If the ground weave is a satin with 3 for its riser, the weave will cover three less or three more than three times the number of threads in the ground weave.

FIG. 1219.

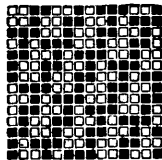


FIG. 1221.

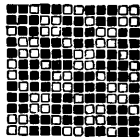


FIG. 1223.

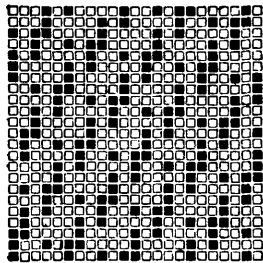
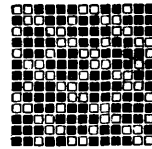


FIG. 1220.

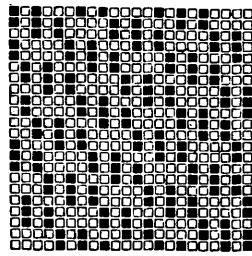


FIG. 1222.

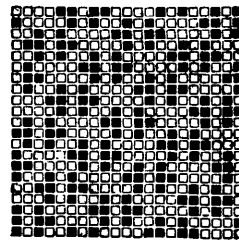


FIG. 1224.

If 3 threads less, the riser of a reform weave is double the number of threads in the ground weave. Fig. 1198, rising 16 picks, is a 21-thread reform weave. The 8-shaft steep twill, Fig. 1197, is the ground weave.

If 3 threads more, the riser of the reform weave is 3 more than the number of threads in the base weave. Fig. 1200, rising 11 picks, is a 27-thread reform weave with the same 8-shaft steep twill, Fig. 1197, as a base, Fig. 1199.

Reform weaves can be so constructed that each thread forms three or four twills before passing to the back.

Figs. 1201 to 1230 illustrate additional forms of these weaves.

Fig. 1201, 8-thread weave on 13 threads, Fig. 1202.
 Fig. 1203, 9-thread weave on 13 threads, Fig. 1204.
 Fig. 1205, 10-thread weave on 17 threads, Fig. 1206.
 Fig. 1207, 10-thread weave on 17 threads, Fig. 1208.
 Fig. 1209, 10-thread weave on 17 threads, Fig. 1210.
 Fig. 1211, 12-thread weave on 19 threads, Fig. 1212.

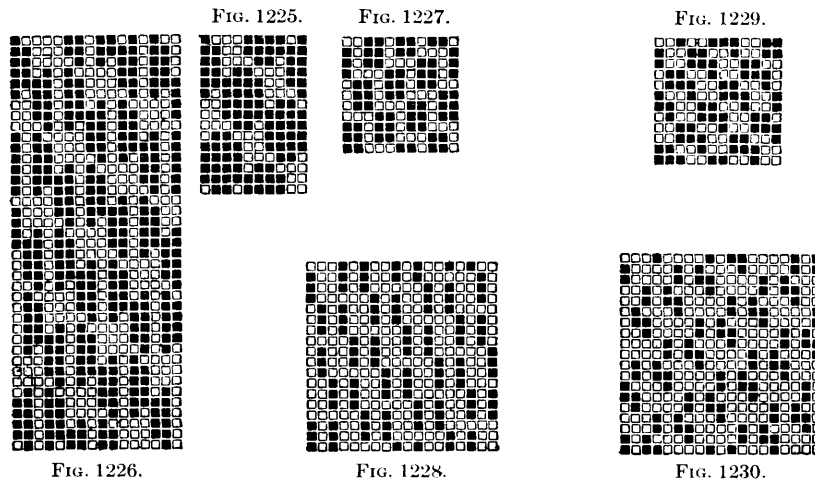


Fig. 1213, 10-thread weave on 13×26 threads, Fig. 1214.

Fig. 1215, 10-thread weave on 13×26 threads, Fig. 1216.

Fig. 1217, 8-thread weave on 15×30 threads, Fig. 1218.

Fig. 1219, 14-thread weave on 23 threads, Fig. 1220.

Fig. 1221, 12-thread weave on 22 threads, Fig. 1222.

Fig. 1223, 13-thread weave on 21 threads, Fig. 1224.

Fig. 1225, 10×15 -thread weave on 13×39 threads, Fig. 1226.

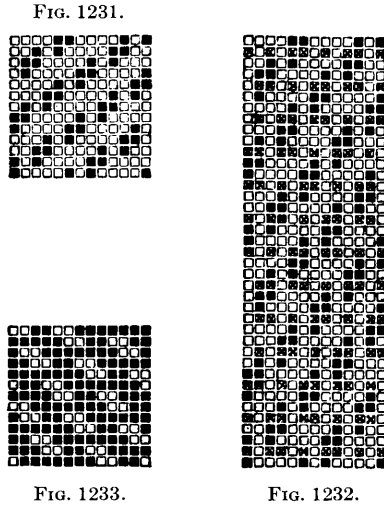
Fig. 1227, 11-thread weave on 18 threads, Fig. 1228.

Fig. 1229, 12-thread weave on 19 threads, Fig. 1230.

REFORM WEAVES WITH STUFFING PICKS

It is frequently necessary to increase the weight of cloths made with reform weaves by introducing extra

filling threads, called stuffing picks, which do not show on either side of the fabric. When the stuffing pick is inserted those threads are raised which float on the face before and after that pick, while those threads are lowered which at that point are floating on the back. This construction is illustrated at Fig. 1232, which shows a stuffing pick inserted after every third pick of Fig. 1231. As there are 13 threads in the pattern at Fig. 1231, two of these patterns are required for the weave at Fig. 1232, making with the stuffing picks a total of 39 picks.



WEAVES IN WHICH THE FILLING THREADS ALTERNATE ON FACE AND BACK

These weaves are obtained by turning the reform weaves already described so as to bring the side at the top of the draft, making the risers sinkers and the sinkers risers. Fig. 1233 shows such a reform weave obtained by turning Fig. 1231, the ground weave being a 4-leaf twill, Fig. 1187. The object of this construction is to obtain a closer set than is possible with the ordinary single cloth.

BACK WARP FABRICS

Weaves with an extra set of warp threads on the back are used for increasing the weight of fabrics. If a face thread alternates with a back in the warp, the set is called 1 and 1. If there are 2 threads on the face to 1 on the back, the set is 2 and 1. If a warp satin is used for the face and a filling satin weave for the back, the warp being dressed 1 gray, 1 white, the face of the cloth will be gray and the back white.

These weaves are not suitable for heavy woolen cloths, as the necessarily close set of the warp makes it difficult to form a good shed with coarse woolen yarn. They can be used for medium-weight woolen fabrics, 18 to 20 ounces per yard, 55 inches wide, but for heavier cloths a back filling answers much better for increasing the weight, as the number of picks can be increased more easily than can the threads in the warp, and a much closer face can thus be obtained.

The back warp weaves answer very well, however, for fine worsted fabrics for men's wear, in which as many as 10,000 or 12,000 ends are sometimes used for 6/4 cloths.

In drafting back warp weaves the first rule to be observed is that the riser of a back thread should have the face warp raised on each side of it. It is sometimes necessary to vary the regular order of stitching the back to prevent single risers from coming next to single sinkers and causing an irregularity in the fabric.

Figs. 1234 to 1260 illustrate various forms of these weaves.

Fig. 1243 shows a 3 up 1 down broken twill on the face with a back warp. The warp is dressed 1 back 1 face. The back warp is woven with a 1 up 3 down

broken twill. This makes the cloth the same on both back and face.

The back and face weaves, Fig. 1234, must be adjusted so that no single stitcher of the face warp comes next to a single stitcher of the back warp. This can be accomplished with only one of the four possible combinations. This weave is used for hair-line effects, which are obtained by a suitable arrangement of colors in warp and filling to make a continuous warp line.

Fig. 1234.

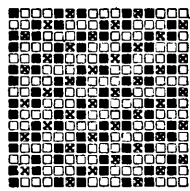


Fig. 1235.

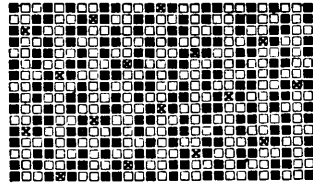


Fig. 1236.

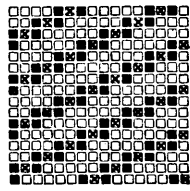
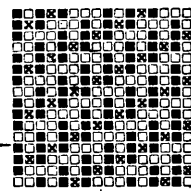


Fig. 1237.

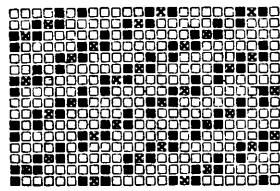


Fig. 1238.

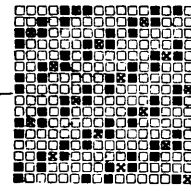


Fig. 1239.

Fig. 1234, 1 and 1, face 2 up 1 down twill; back 1 up 2 down twill.

Fig. 1235, 2 and 1, face 2 up 1 down twill; back 9-leaf satin.

Fig. 1236, 1 and 1, face 3 up 1 down twill; back 1 up 3 down twill.

Fig. 1237, 1 and 1, face 2 up 2 down twill; back 1 up 3 down twill.

Fig. 1238, 1 and 1, face 2 up 2 down twill; back 12-leaf.

Fig. 1239, 1 and 1, face 2 up 2 down twill; back 8-leaf satin.

Fig. 1240, 1 and 1, face 3 up 2 down twill; back 1 up 4 down twill.

Fig. 1241, 2 and 1, face 3 up 2 down twill ; back 10-leaf satin.

Fig. 1242, 1 and 1, face 3 up 3 down twill ; back 1 up 5 down twill.

Fig. 1243, 1 and 1, face 3 up 1 down broken twill ; back 1 up 3 down broken twill.

Fig. 1244, 1 and 1, face 5-leaf satin ; back 5-leaf satin.

Fig. 1245, 1 and 1, face 7-leaf satin ; back 7-leaf satin.

Fig. 1246, 1 and 1, face 8-leaf satin ; back 8-leaf satin.

Fig. 1247, 2 and 1, face 8-leaf double satin ; back 16-leaf.

FIG. 1240.

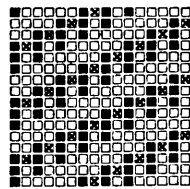


FIG. 1241.

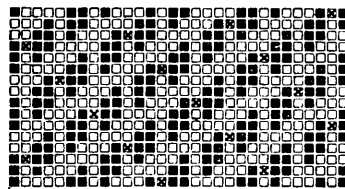


FIG. 1242.

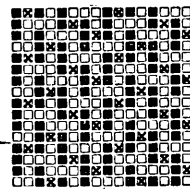
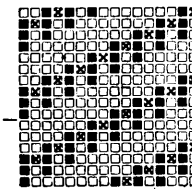


FIG. 1243.

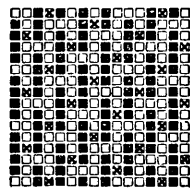


FIG. 1244.

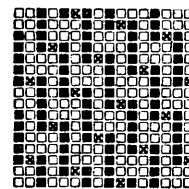


FIG. 1245.

Fig. 1248, 1 and 1, face 8-leaf double satin ; back 8-leaf satin.

Fig. 1249, 1 and 1, face 10-leaf double satin ; back 10-leaf satin.

Fig. 1250, 2 and 1, face 10-leaf double satin ; back 10-leaf.

Fig. 1251, 2 and 1, face 4-leaf basket ; back 1 up 3 down broken twill.

Fig. 1253, 1 and 1, face crêpe, Fig. 1252 ; back 8-leaf satin.

Fig. 1254, 1 and 1, face 13-leaf twill rib ; back 26-leaf.

Fig. 1256, 2 and 1, face crêpe, Fig. 1255 ; back 10-leaf.

FIG. 1246.

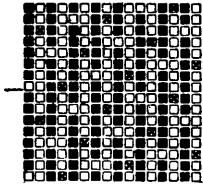


FIG. 1247.

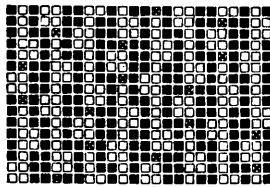


FIG. 1248.

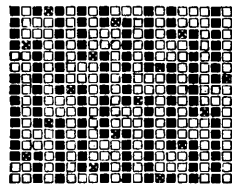
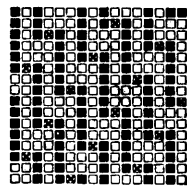


FIG. 1249.

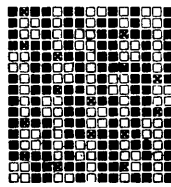


FIG. 1250.

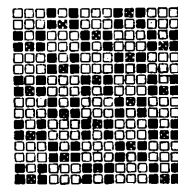


FIG. 1251.

FIG. 1252.



FIG. 1255.

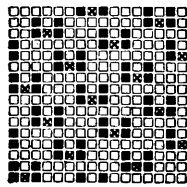
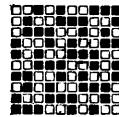


FIG. 1253.

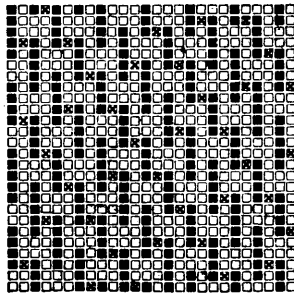


FIG. 1254.

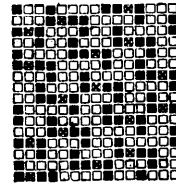


FIG. 1256.

FIG. 1257.

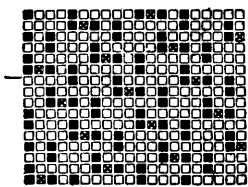


FIG. 1258.

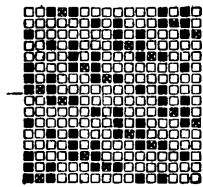
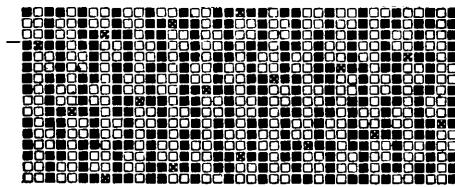


FIG. 1259.

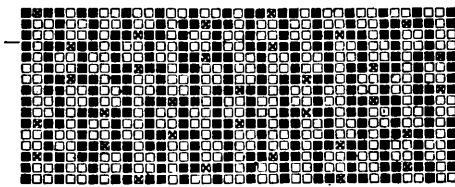


FIG. 1260.

Fig. 1257, 1 and 1, face crêpe, Fig. 1255; back 10-leaf.
 Fig. 1258, 2 and 1, face twill rib, Fig. 472; back 13-leaf.

Fig. 1259, 1 and 1, face crêpe, Fig. 1028 *c*; back 8-leaf.
 Fig. 1260, 2 and 1, face twill rib, Fig. 472; back 13-leaf.

Fig. 1243 is well suited for kersey fabrics. The warp for kerses is set closer than the filling in order that the nap may be raised mainly from the parallel fibers of the warp and thus produce a smooth effect lengthways of the piece.

Hair lines on the contrary are generally sheared close, as a sandy feel is desired. For this reason the warp and filling are more nearly balanced. The following layouts for a kersey and a hair line, both woven with the weave at Fig. 1243, illustrate the difference between the proportions of warp and filling:

KERSEY

Warp, 88 ends per inch finished.
 Filling, 67 ends per inch finished.
 21 threads (33 per cent) more per inch in warp than in filling.

HAIR LINE

Warp, 70 ends per inch finished.
 Filling, 65 ends per inch finished.
 5 threads (8 per cent) more per inch in warp than in filling.

By turning Fig. 1243 one-quarter way around the back filling weave shown at Fig. 1283 is obtained.

A divided drawing-in draft, No. 8, Figs. 25 and 26, is used for a back warp weave and arranged to bring the back threads on the back shafts and the face threads on the front shafts nearest to the reed.

When weaving cloth with a worsted face warp and woolen back warp, it is a better plan to reverse this

order, bringing the back warp on the front shafts nearest to the reed.

Every filling thread in these weaves should be stitched by the back warp. This is necessary in order that the picks may be held in the same relative position and the face remain smooth and uniform.

WEAVES WITH BACK WARP AND STUFFING PICKS

It is sometimes necessary to introduce stuffing picks in worsted fabrics to obtain sufficient weight. A stuffing pick is woven so as to lie between the face and back warp in the center of the fabric. The usual

FIG. 1261.

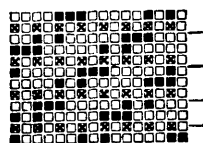
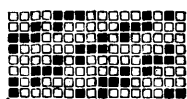


FIG. 1262.

FIG. 1263.

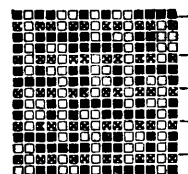
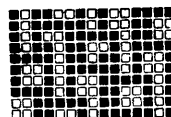


FIG. 1264.

order is 2 regular picks, 1 stuffing pick. When the stuffing pick is woven, all the face warp threads are raised, and all back warp lowered.

Fig. 1262 shows Fig. 1261 woven with a stuffing pick, the warp being dressed 1 face, 1 back; filling, 2 regular picks, 1 stuffing pick.

Fig. 1264 shows Fig. 1263 woven with a stuffing pick, the warp being dressed 2 face, 1 back; filling, 2 regular picks, 1 stuffing pick.

The stuffing picks are indicated by the lines at the side of the drafts and are drafted with crosses (X), Figs. 1262 and 1264.

BACK FILLING FABRICS

Back filling is used to make cloths thicker and heavier. It also enables the cost to be reduced by the use of cheaper material for the back. For this purpose the back filling is usually spun heavier than the face filling or the warp. If, however, the difference between the size of the face and back filling, woven 1 and 1, is too great, the appearance of the face will be injured, as the coarse backing will prevent the filling threads from lying close together to form a smooth face. This difficulty can be remedied only by weaving two or three face picks to one back pick. Even then there is a limit to the size of the back filling that can be advantageously used.

The back filling may be interlaced either with the regular warp, making one set of warp threads and two sets (face and back) of filling threads; or it may be interlaced with a separate set of back warp threads, making the regular double cloth.

For fabrics made with one set of warp and two sets (face and back) of filling, the two principal rules of construction are :

1. The back filling must be interlaced so as not to disturb the position of the warp and filling on the face.
2. The interlacing of the warp and back filling should not hinder the approach of any two adjacent picks to each other. The back shed should be formed so as to allow the face pick to slide over and cover the preceding back pick. This is made plain by Fig. 1265, in which the face pick cannot pass readily to its position above the back pick because warp threads 4, 8, 12, etc., which are under the back pick, are raised above the

adjacent face pick, forming a barrier to the free passage of the latter.

Likewise a back pick cannot pass under a preceding face pick when a warp thread that is raised above the adjacent face pick is lowered below the back pick. In Fig. 1266, threads 4, 8, 12, etc., which are raised above the face pick are lowered below the back pick and thus hinder the passage of the back pick to its proper position below the face pick.

This rule applies to regular smooth faced fabrics. The arrangement of the filling threads in a back filling weave as shown at Figs. 1265 and 1266 is sometimes used to produce tricot effects, which will be described later.

3. When a back pick is stitched by lowering a warp thread below it, this warp thread should be under



FIG. 1265.



FIG. 1266.



FIG. 1267.

both the preceding and succeeding picks as shown in Fig. 1267. This rule cannot be followed in the case of double cloths having a plain weave on the face.

4. The face and back picks should alternate with each other in regular order. Where both are of the same size it is advisable, especially for close fabrics, to arrange them 1 face 1 back. For loose fabrics, such as those woven with 6- and 8-leaf satins, the order may be 2 face 2 back. If the back filling is much coarser than the face, the filling is woven 2 face 1 back, or 3 face 1 back.

5. If the face filling is woven with long floats, the stitchers for the back filling should come as nearly as possible opposite the center of the face filling float. The stitchers for the back filling should come where the back filling yarn will be covered by the adjacent face filling threads.

The back filling should rise above but one warp

thread at a time. If, however, the face filling floats over as many as five or six consecutive warp threads, the back filling can be stitched over two adjacent warp threads at a time, providing the face and back colors do not contrast too sharply.

6. To secure a uniform tension on the warp threads, it is desirable that the stitching of the back filling be distributed uniformly over all the warp threads. If some of the warp threads are not stitched to the face, they may become slack and cause an imperfect shed in weaving.

To draft a back filling weave, the order of face and back picks is first marked on the cross-section paper. The face weave is then drafted, leaving the back

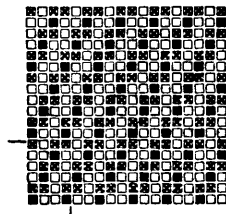


FIG. 1268.

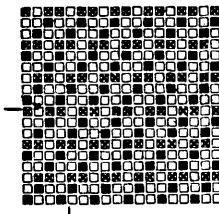


FIG. 1269.

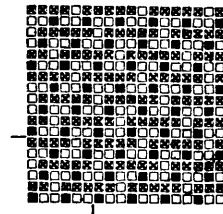


FIG. 1270.

filling spaces unmarked. The back weave is then drafted in accordance with the preceding rules.

Following are examples of the more important back filling weaves:

Fig. 1268, twill face 1 up 2 down; twill back 2 up 1 down; woven 1×1 .

Fig. 1269, twill face 1 up 2 down; twill back 2 up 1 down; woven 2×1 .

Fig. 1270, twill face 1 up 2 down; twill back 5 up 1 down; woven 1×1 .

Fig. 1271, plain face; twill back 3 up 1 down; woven 1×1 .

Fig. 1272, plain face; 8-leaf satin back; woven 1×1 .

Fig. 1273, twill face 1 up 3 down; twill back 3 up 1 down; woven 1×1 .

Fig. 1274, twill face 2 up 2 down; twill back 3 up 1 down; woven 1 × 1.

Fig. 1275, twill face 2 up 2 down; twill back 7 up 1 down, woven 1 × 1.

FIG. 1271.

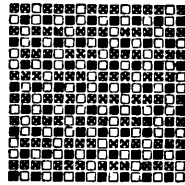


FIG. 1272.

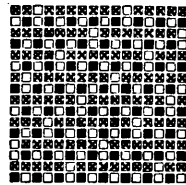


FIG. 1273.

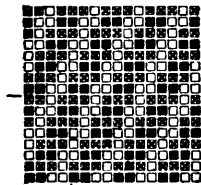
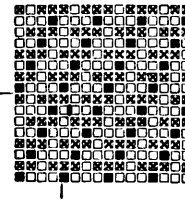


FIG. 1274.

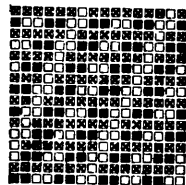


FIG. 1275.

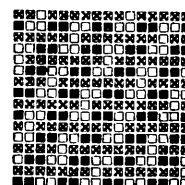


FIG. 1276.

FIG. 1277.

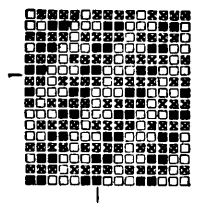


FIG. 1278.

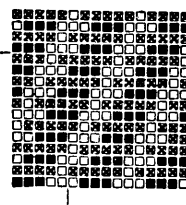


FIG. 1279.

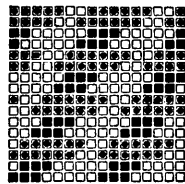
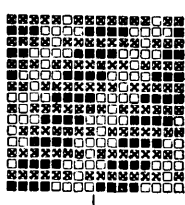


FIG. 1280.

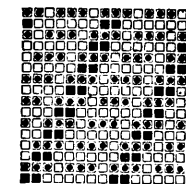


FIG. 1281.

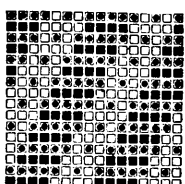


FIG. 1282.

Fig. 1276, twill face 2 up 2 down; 8-leaf satin back; woven 1 × 1.

Fig. 1277, twill face 2 up 3 down; twill back 4 up 1 down; woven 1 × 1.

Fig. 1278, twill face 3 up 3 down; twill back 5 up 1 down; woven 1×1 .

Fig. 1279, twill face 4 up 4 down; twill back 7 up 1 down; woven 1×1 .

Fig. 1280, twill face 3 up 5 down; twill back 6 up 2 down; woven 2×2 .

Fig. 1281, twill face 2 up 6 down; twill back 3 up 1 down; woven 1×1 .

Fig. 1282, twill face 4 up 4 down; twill back 5 up 1 down 1 up 1 down; woven 1×1 .

FIG. 1283.

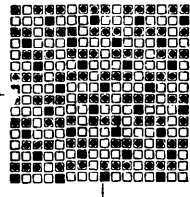


FIG. 1284.

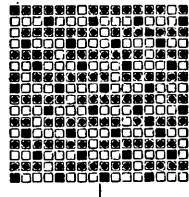


FIG. 1285.

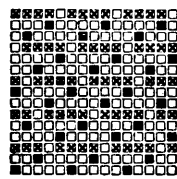
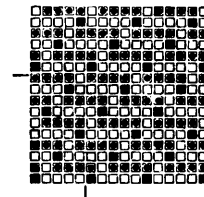


FIG. 1286.

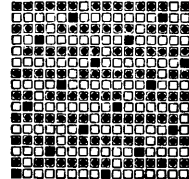


FIG. 1287.

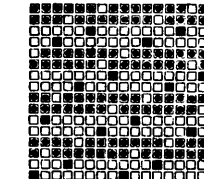


FIG. 1288.

Fig. 1283, broken twill face 1 up 3 down; broken twill back 3 up 1 down; woven 1×1 .

Fig. 1284, broken twill face 1 up 3 down; 8-leaf satin back; woven 1×1 .

Fig. 1285, 5-leaf satin face; 5-leaf satin back; woven 1×1 .

Fig. 1286, 5-leaf satin face; 5-leaf twill back; woven 2×1 .

Fig. 1287, 8-leaf satin face; 8-leaf satin back; woven 1×1 .

Fig. 1288, 8-leaf satin face; 8-leaf satin back; woven 2×2 .

Fig. 1289, twill face 2 up 2 down ; 12-leaf back ; woven 1×1 .

Fig. 1290, twill face 2 up 2 down ; 8-leaf back ; woven 1×2 .

Fig. 1291, modified broken twill face ; 8-leaf satin back ; woven 2×1 .

Fig. 1292, 8-leaf modified satin face ; 8-leaf satin back ; woven 2×1 .

FIG. 1289.

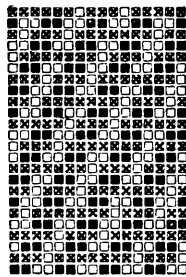


FIG. 1290.

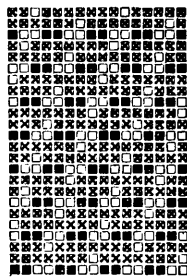


FIG. 1291.

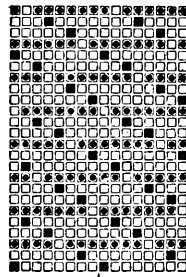
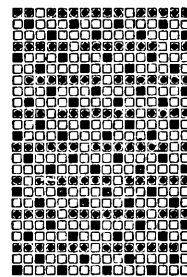


FIG. 1292.

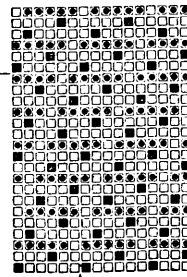


FIG. 1293.

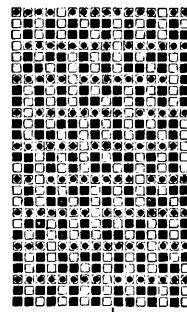


FIG. 1294.

Fig. 1293, modified 6-leaf satin face ; 6-leaf back ; woven 2×1 .

Fig. 1294, corkscrew twill face ; 5 up 4 down, Fig. 457 ; 9-leaf back ; woven 2×1 .

Fig. 1295, 8-leaf double satin face ; 8-leaf satin back ; woven 1×1 .

Fig. 1296, 3-leaf pointed twill face ; 6-leaf back ; woven 1×1 .

- Fig. 1297, 4-leaf broken twill face; 4-leaf broken twill back; woven 1×1 .
- Fig. 1298, interlocking twill (Fig. 510) face; 9-leaf back; woven 1×1 .
- Fig. 1301, 7-leaf double satin face; 7-leaf satin back; woven 2×1 .
- Fig. 1303, 6-leaf satin face; 6-leaf satin back; woven 1×1 .
- Fig. 1304, twill face 2 up 2 down; woven 1 face pick 1 back pick 3 up 1 down, 1 back pick 7 up 1 down.

FIG. 1295.

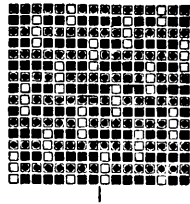


FIG. 1296.

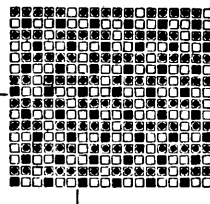


FIG. 1297.

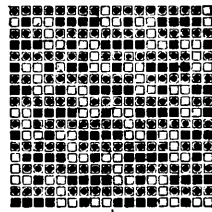
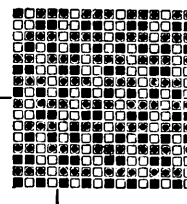


FIG. 1298.

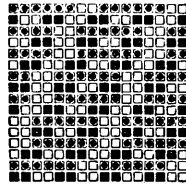


FIG. 1299.

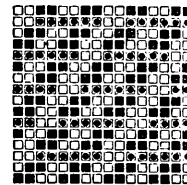


FIG. 1300.

- Fig. 1305, 7-leaf satin face; 7-leaf satin back; woven 2×1 .
- Fig. 1307, 5-leaf warp satin face; 10-leaf warp satin back; woven 1×1 .
- Fig. 1308, twill face 2 up 3 down, 10-leaf satin back; woven 2×1 .
- Fig. 1309, twill face 2 up 2 down; woven 1 face 2 up 2 down, 1 stuffing pick 1 down 4 up 1 down 1 up 1 down 4 up, 1 back pick 1 down 11 up; this may also be considered as woven 2 face 1 back, making a 12-leaf diagonal.

Fig. 1310, basket face 3 up 3 down ; woven 1 face, 1 back, 1 face, 1 back, 1 face.

Fig. 1314, crêpe face, Fig. 1311 ; back 9 up 1 down 5 up 1 down ; woven 2×1 .

FIG. 1301.

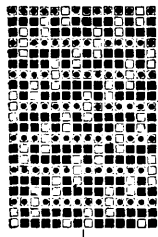


FIG. 1302.

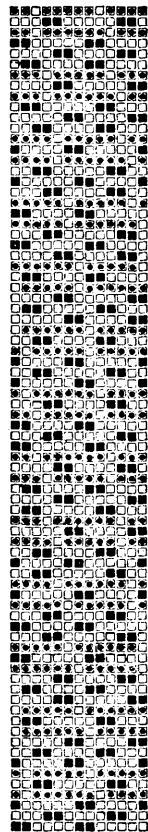


FIG. 1303.

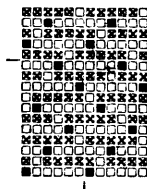


FIG. 1304.

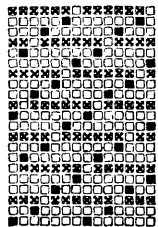
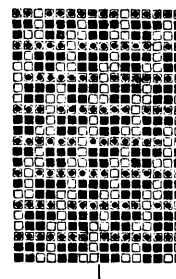


FIG. 1305.

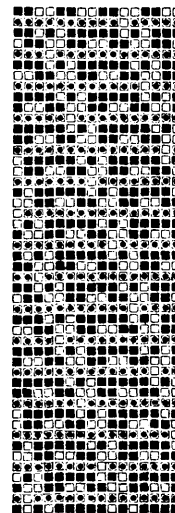


FIG. 1306.

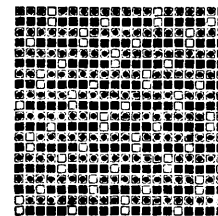


FIG. 1307.

A heavier fabric can be made with Fig. 1270 than with either Fig. 1268 or Fig. 1269, as the back filling in Fig. 1270 is stitched but once in six threads instead of every third thread.

As both Figs. 1271 and 1272 are woven with a plain weave on the face, rule 3, already given, cannot be followed. These weaves are in common use.

When a warp thread passes below and stitches a back pick, it should also lie below the preceding face pick. For example, in Fig. 1271 thread 4, which stitches pick 2 (back) is below pick 1 (face).

A fabric can be made much heavier with either Fig. 1275 or Fig. 1276, in which the back filling is stitched every eighth thread, than if woven with Fig. 1274, in which the back filling is stitched every fourth thread.

These three back filling weaves, Figs. 1274, 1275 and 1276, have the same weave, a 4-leaf twill, on the face. When, however, the back filling weave covers twice as many warp threads as the face weave, the back stitchers must be brought on alternate face twills in order to prevent them from affecting the appearance of the face. If the back stitchers are all brought on the same face twill, this twill will appear flatter and narrower than the other twill under which the back picks float without stitchers.

Fig. 1275 shows all the back stitchers on the same twill line, producing an uneven face, while in Fig. 1276 the face twills will be uniform because the back stitchers come on alternate twills.

Fig. 1289 is also arranged, like 1276, to give a smooth face.

The arrangement of 1 face 2 back, shown at Fig. 1290, is for the purpose of reducing the cost of the fabric, cheaper material being used for the back than for the face.

Back filling cloths are sometimes made firmer by stitching the back filling two or more times in each weave pattern, as shown at Figs. 1281 and 1282.

Fig. 1280 shows the back pick stitched by being raised above two adjacent warp threads. This method is admissible for weaves with long floats, but the contrast in color or quality between the face and back should not be too sharp.

Fig. 1283 gives a very firm fabric. As the filling is woven 1 face 1 back the yarn on the back and face

should be about the same size. This weave is well adapted for a close finish on woolen fabrics. In checks and plaids two adjacent threads of one color in the warp are required to balance one face thread of the same color in the filling.

Plain wool and silk mixtures are made with this weave. The warp and back filling are usually black, the face filling being all 2-ply made of 1 single black, 1 organzine silk.

Fig. 1283 is Fig. 1243 turned one-quarter way round to transpose the warp and filling.

Fig. 1283 may be used for a cotton warp frieze, the warp being hid by both face and back. The use of cotton warp for friezes is of doubtful economy owing to the necessity of increasing the number of picks to obtain the required weight. A cotton warp frieze woven with Fig. 1283 can be striped in the warp by weaving fancy woolen warp threads on an extra harness in 5 up 3 down broken twill order.

Fig. 1293 is suited for cotton warp piece dyed chinchillas.

Figs. 1283, 1284, 1285, 1286, 1287, 1288, 1291, 1292, 1293, 1303 and 1305 are weaves in which the filling predominates on the surface of both face and back, the warp being covered. Such weaves are often used for cheap fabrics in which the warp is cotton yarn and the filling medium wool or shoddy. If the filling is made of shoddy and spun to a coarse count, the 1 and 1 or 2 and 2 order is usually changed to 2 face 1 back in order to improve the appearance of the face. The face weave is arranged to give a regular stitching of the back filling. This arrangement is shown at Figs. 1291, 1292 and 1293.

When cloth in which the warp predominates on the face is woven with a back filling, the latter must float at least twice as far as the face filling and be so interlaced that stitchers shall come on every twill line. In such weaves it is not always possible to have the

stitching warp thread below the face thread both before and after the back pick.

This difficulty is illustrated at Fig. 1307, in which the warp thread that stitches a back pick is below the preceding face pick, but above the succeeding face pick. If, however, the face weave is a double warp satin, instead of single, the stitchers can be inserted so that the warp thread lies below the face pick on each side of the stitched back pick, Figs. 1295 and 1301.

For fine stripes a 3-leaf twill, pointed in the filling, is used, with the face picks stitched successively on warp threads, 1, 2, 3, 2, Fig. 639. Fig. 1296 shows such a weave with the back filling stitched only on warp threads, 1, 3, 4, 6. The absence of back stitchers on warp threads 2 and 5 does not cause irregularity of tension because these two threads are woven plain and thus interlace the face filling more closely than the other warp threads, which are woven 1 up 2 down.

It is evident from Fig. 1296 that the face of back filling weaves need not be regular twills or satins. Most weaves are suited for the face of back filling fabrics, especially those in which the warp passes below two successive filling threads.

Fig. 1297 is a broken 2 up 2 down twill, Fig. 382, on the face, with a broken 3 up 1 down twill on the back.

Fig. 1294 is a corkscrew, Fig. 457, on the face, with a 9-leaf back weave.

Fig. 1298 is an interlocking twill, Fig. 510, on the face with a 9-leaf back weave. All three are suitable for heavy goods.

Two back picks can be inserted between each face pick. In such a case one back pick passes below the other and floats twice as far. Fig. 1304 shows such a weave in which one back pick, stitched with an 8-leaf satin, passes under the other back pick, which is stitched with a 3 up 1 down twill, the face weave being a 2 up 2 down twill.

Fig. 1309 shows the diagonal, Fig. 326, woven with back filling. This weave can be designated as 2 face, 1 back or 1 face, 1 stuffing pick, 1 back.

In Fig. 1310 each warp thread stitches the back filling twice in each filling pattern. The face is a 6-leaf basket. The filling is woven 1 face, 1 back, 1 face, 1 back, 1 face.

Fig. 1314 shows the crêpe weave, Fig. 1311, with each back pick woven 9 up 1 down 5 up 1 down. The filling is woven 2 face, 1 back.

Figs. 1302 and 1315 are often used for fine worsteds.

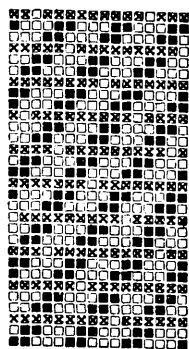


FIG. 1308.

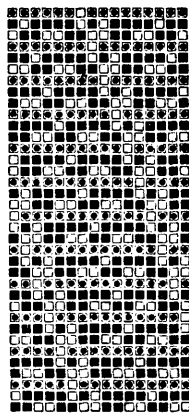


FIG. 1309.

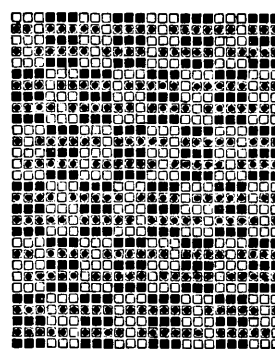


FIG. 1310.

The twill form in which the back picks are stitched causes a diagonal break or recess on the face.

Figs. 1306, 1313 and 1316 are used for military diagonals and cloth for riding breeches.

Fig. 1306 is woven 1 face, 1 stuffing pick, 1 back.

Fig. 1313, 1 face, 1 back.

Fig. 1316, 2 face, 1 back.

A diagonal recess is obtained by stitching the back picks as shown at Figs. 1299 and 1300.

A familiarity with the construction of back filling weaves is important, especially when dissecting cloths of this kind which may have been fullled hard.

When drafting back filling weaves in which it is

difficult to stitch the back picks regularly, the stitchers are arranged to conform to the face weave. For this purpose a space is left between each two face picks, and on each of these lines risers are marked where the back pick should be stitched. The face weave is then drafted so that as many of the back stitchers as possible may come where the warp is below both the preceding and succeeding picks. The remaining stitches are then rearranged to effect the same result while disturbing the regular order as little as possible.

Fig. 1311.

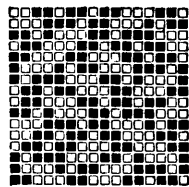


Fig. 1312.

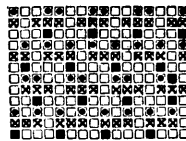


Fig. 1313.

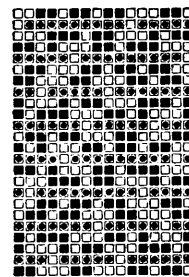
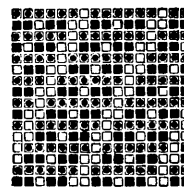


Fig. 1314.

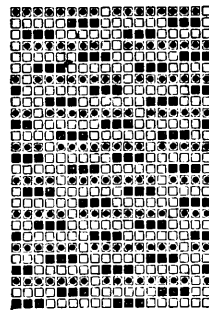


Fig. 1315.

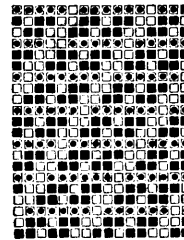


Fig. 1316.

Fig. 1302 is a back filling weave, 3 face, 1 back, 1 face, 1 back.

Fig. 1312, used for woven felt, is a broken 1 up 3 down twill on the face and a broken 3 up 1 down twill on the back, woven 1 face, 1 back, 1 stuffing pick. After each two picks (1 face, 1 back) there is inserted a stuffing pick which lies between the face and back. Above this pick is raised every warp thread that is raised above the preceding or succeeding face pick.

Fig. 1306, 16-shaft, woven 1 face, 1 stuffing pick,
1 back.

Fig. 1312, woven 1 face, 1 back, 1 stuffing pick.

Fig. 1315, woven 2 face, 1 back.

Fig. 1316, 7-shaft, woven 2 face, 1 back.

TRICOT WEAVES

Cloths having the face broken with narrow and uniform furrows or ridges to resemble knitted fabrics are called tricots, the name being derived from the French *tricoter*, to knit. When the furrows run lengthways or in the direction of the warp, the weave is called "tricot long." If the furrows run crossways or with the filling, it is called "tricot cross."

The simplest way of obtaining a tricot effect is by alternating a thread of right twist with one of left twist in both warp and filling on a plain weave. The reversal of the twist causes a ridge or tricot, which is very effective in light fabrics. Combinations of tricot long and tricot cross effects can be made by a suitable arrangement of threads of different twist in both warp and filling.

TRICOT LONG

In the weaves at Figs. 1317 and 1318 tricot effects are produced by alternating two threads of a warp weave with two threads of a filling weave.

Fig. 1317, 2 threads woven 3 up 1 down, 2 threads woven 1 up 3 down.

Fig. 1318, 2 threads woven 4 up 1 down, 2 threads woven 1 up 4 down.

Combinations of 2 up 1 down with 1 up 2 down can also be used for this purpose.

At Fig. 1319 a group of 4 warp threads is woven plain on alternate picks, the other picks floating on the back. The plain weave and float are transposed for the next 4 threads, the back pick interlacing the warp in plain weave order, while the plain pick floats on the back. This exchange of position after each

4 warp threads causes a rib or tricot line and produces an elastic fabric. It is suited for a tricot effect in worsted dress goods with 150 to 170 picks of 1/70s to 1/80s worsted per inch.

For heavy tricot cloths, transposed double weaves, as shown at Fig. 1320, are used. In Fig. 1320 the first 4 warp threads form two plain cloths, one above the other, and not stitched in any way. After the fourth thread every back pick comes to the face, while the face picks pass to the back. In this new position two

FIG. 1317.

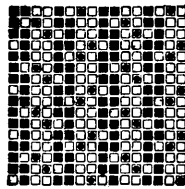


FIG. 1318.

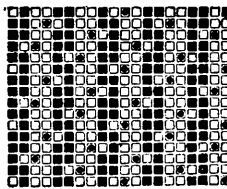


FIG. 1319.

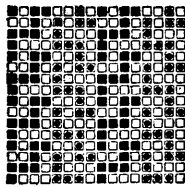
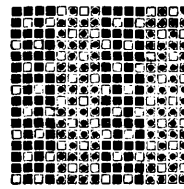


FIG. 1320.

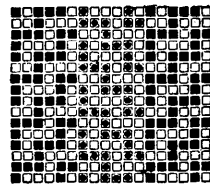


FIG. 1321.

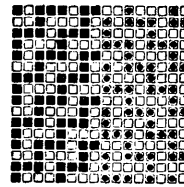


FIG. 1322.

plain cloths are again made for 4 threads when the back and face picks again are transposed, resuming their original position for another four threads. The transfer of the filling from face to back and from back to face makes one compact fabric.

At the point where the face and back picks are transposed a back warp thread, woven 1 up 3 down, breaks with the adjacent face warp thread, woven 3 up 1 down, as shown by threads 4 and 5, Fig. 1320. This sharp break tends to separate the two adjacent face warp threads, 3 and 5, Fig. 1320, causing the face warp to form groups of two threads each. Threads

1 and 3 lie close together, as do threads 5 and 7, developing the tricot effect.

Fig. 1320 may also be considered as a back warp weave with a broken 3 up 1 down twill on the face and a broken 1 up 3 down twill on the back, the two weaves being so adjusted as to cause the break already described. By an increase in the width between the breaks the double plain weave is clearly developed as shown at Figs. 1321 and 1322. The face and back picks are transposed every 6 threads in Fig. 1321, and every 8 threads in Fig. 1322.

Fig. 1323 shows a pattern with tricot stripes of different widths.

Very heavy tricot cloths are made with extra back

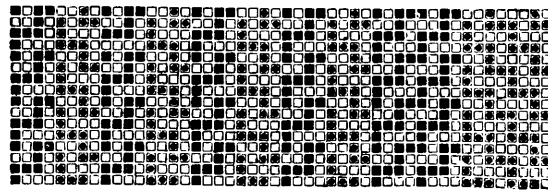


FIG. 1323.

warp or filling. Fig. 1324 shows the tricot long, Fig. 1320, with a back filling stitched in 7 up 1 down order.

Tricot long effects are frequently used for fine woolen goods in which the face warp consists of woolen yarn twisted with organzine silk.

TRICOT CROSS

Tricot cross effects are obtained by turning the tricot long weaves one-quarter way around, thus transposing the warp and filling. Fig. 1325 shows 2 picks of a broken 3 up 1 down twill alternating with 2 picks of a broken 1 up 3 down twill. The filling threads are arranged to avoid a sharp break like that in the warp of the tricot long, Fig. 1317. The tricot effect can be made more pronounced by using heavier filling for the picks that float on the back.

Fig. 1326 is a cross tricot weave obtained by turning Fig. 1320 one-quarter way around to bring the back threads in the filling. It is shown at Fig. 1327 with a stuffing pick in each stripe to increase the weight of the cloth.

Fig. 1326 may be considered a double plain weave with face and back warp threads transposed every 4 picks. As the tricot effect covers the same number of threads as in Fig. 1320, it may be considered a back filling weave with the face a broken 1 up 3 down twill, and the back a broken 3 up 1 down twill, the two weaves being adjusted to cause a break by bringing a

FIG. 1324.

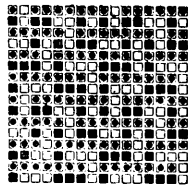


FIG. 1325.

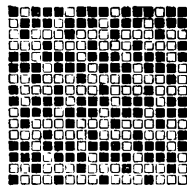


FIG. 1326.

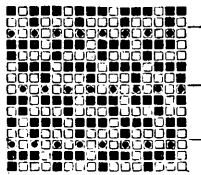
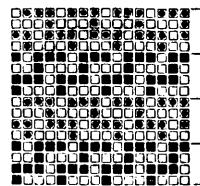


FIG. 1327.

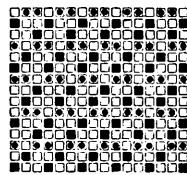


FIG. 1328.

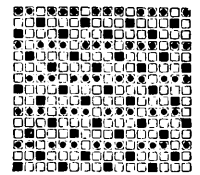


FIG. 1329.

single riser on a face pick next to a single sinker on a back pick.

Fig. 1328 shows a back filling tricot weave, 2 face, 1 back. The face weave is a 1 up 2 down twill to the right; the back weave a 2 up 1 down twill to the left. Each sinker on the back pick comes next to a riser on the preceding face pick, producing the break or tricot effect.

Fig. 1329 shows a similar arrangement with a broken 1 up 3 down twill on the face and a 3 up 1 down twill to the right on the back; woven 2 face, 1 back.

Figs. 1328 and 1329 are suited for very fine tricot effects.

In tricot fabrics the effect depends in large measure upon the correct adjustment of the set of warp and filling, and upon the relative size of the warp and filling yarn. Thus in Fig. 1326 the tricot effect is made more pronounced by increasing the relative size of the filling yarn as compared with the warp.

CLOTHS WITH AN EXTRA INNER FABRIC

If the threads of a fabric float for long distances, it is frequently necessary, in order to prevent slipping of the warp and filling and to make the cloth more durable, to introduce an extra inner fabric, which is usually woven with a plain weave.

FIG. 1330.

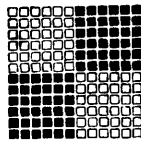


FIG. 1332.

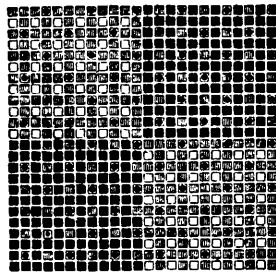
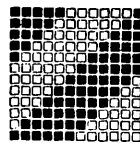


FIG. 1331.

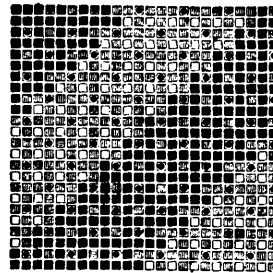


FIG. 1333.

Fig. 1331 is a 6 up 6 down basket, Fig. 1330, woven 1 and 1 with an inner plain weave. It is drafted as follows :

1. The warp and filling threads for the inner fabric are shaded to distinguish the inner from the outer threads.
2. The inner plain weave is drafted with dotted circles on the shaded threads.
3. The weave for the outer threads is drafted with black squares.
4. The inner and outer weaves having been drafted

as above, it is now necessary to raise the outer warp threads above the inner picks when the outer threads float on the face. Where the outer warp is above an outer pick, the outer warp thread is also raised above the succeeding inner pick, thus bringing the inner pick below the outer warp.

It is also necessary to raise the inner warp threads above the outer picks where the latter float on the back. Where an outer warp thread is raised above an outer

FIG. 1334.

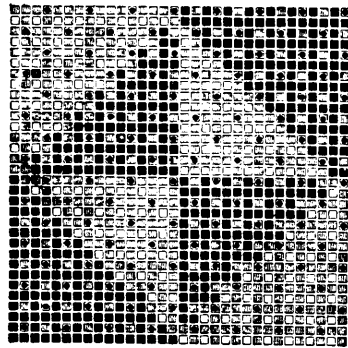
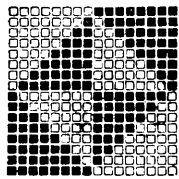


FIG. 1335.

pick, the inner warp thread at the right is also raised above the same outer pick, thus bringing the inner warp thread above the outer filling.

No additional risers are necessary in the squares where the outer picks float on the face, because the outer picks come above the adjacent inner picks, while the outer warp threads float on the back.

This fourth and last operation of drafting may be stated thus :

Place a riser to the right and also above each riser of the outer weave.

The completed draft is shown at Fig. 1331.

Figs. 1331, 1333 and 1355 are weaves for cloths with extra inner fabrics, the outer weaves being shown at Figs. 1330, 1332 and 1334 respectively.

When the fabric is laid 2 inner, 1 outer, the fourth operation is changed to the following :

Place a riser at the right and left as well as above and below each riser of the outer weave, as shown at Fig. 1337, for which Fig. 1336 is the ground weave.

On the other hand, when the cloth is laid 2 outer,

1 inner, the fourth operation is changed to the following :

Place a riser above every riser on each outer pick that is followed by an inner pick ; and place a riser at the right of every riser of each outer warp thread that is followed by an inner warp thread, as shown at Fig. 1340, for which Fig. 1339 is the ground weave.

FIG. 1336.



FIG. 1338.

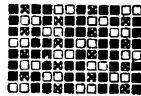


FIG. 1339.

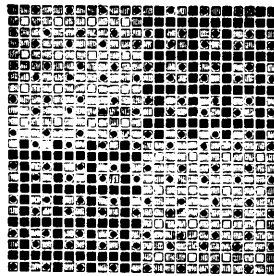
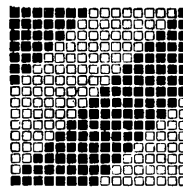


FIG. 1337.

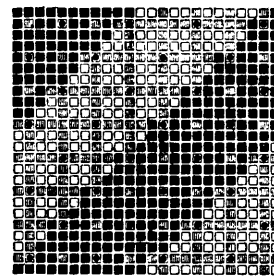


FIG. 1340.

Fabrics are also woven with plain stitch threads running in only one direction, warp or filling, and which are completely covered by the other threads.

Fig. 1338 shows a broken 3 up 1 down twill to which an extra warp thread is stitched plain, 1 up 1 down with the filling. The warp is 2 regular, 1 extra. The two weaves are so adjusted that the extra warp threads are covered by the regular threads.

DOUBLE CLOTHS

A double cloth consists of two distinct fabrics, face and back, which are generally stitched together by interlacing the face threads with the back threads. The various applications of double cloth construction are as follows :

1. Tubular fabrics, such as lamp wicking, fire hose, seamless bags, woven felt for covering pipes, etc. The face and back are joined at both sides, forming a tubular fabric.

2. To produce a fabric of uniform density. Frequently the face does not permit the addition of a back filling only, in which case a separate set of warp threads for the back must be added to carry the back filling.

3. To make the fabric thicker and heavier than is possible with back filling alone. It is evident that in double cloth, the warp threads being divided into two parts, a much smaller number of threads are inserted in one texture than is the case with back filling cloths, in which all the warp threads are woven together. The more open the set of the warp, the more easily will it receive the filling, and thus the thicker and heavier can the cloth be made.

4. For the better production of plaids and checks in both light and heavy goods. If such patterns are made in filling back fabrics, the set of the filling is likely to be too coarse, as it is impossible to insert as many face picks per inch in a filling back cloth as in a cloth without back filling. The result of the more open filling set is that each square of the weave represents

a space which in the cloth itself is longer than it is wide. The chief defect of such a texture is that the warp colors are more prominent than the filling. This is due to the more open set of the filling, which leaves the warp threads more exposed. This difficulty may be relieved by laying the warp with a more open set, using finer yarn for the back filling and inserting more picks.

5. Cloths are also made double in order that the cost may not increase in proportion to the increase in the weight and thickness. Double textures not only permit the insertion of more filling, but offer the advantage that in both warp and filling the backing yarn can be made of much cheaper material than that used for the face. This is especially true of the back filling yarn which in double cloths is often very heavy and made of exceedingly low stock. Such yarn, if used for the backing of regular back filling cloths, would be likely to show through on the face. Moreover, the heavy backing would make it impossible to drive the required number of picks into back filling fabric.

6. Cloths with face and back of contrasting colors, such as plaid-back overcoating. The set and weave of the back of a double cloth are usually made to conform to those of the face. This, however, is not essential. Both the set and weave of the back may be entirely different from those on the face. This is not to be understood as permitting the use of any and every possible combination of diverse weaves and sets for back and face, as the shrinking or fulling properties of the different textures must be considered. Judgment must be used on this point as no fixed rules can be laid down.

The face and back threads in both warp and filling are arranged so that one back thread comes after one, two, three, or four face threads. Following are some practical combinations:

FACE WEAVE	BACK WEAVE	SET
Plain	Plain	1 face 1 back
Plain	Plain	2 face 1 back
Plain	Twill 2 up 2 down	1 face 1 back
Plain	Basket 2 up 2 down	1 face 1 back
Basket 2 up 2 down	Basket 2 up 2 down	1 face 1 back
Basket 2 up 2 down	Plain	2 face 1 back
Basket 3 up 3 down	Plain	2 face 1 back
Basket 3 up 3 down	Plain	3 face 1 back
Twill 2 up 1 down	Plain	2 face 1 back
Twill 2 up 2 down	Plain	2 face 1 back
Twill 2 up 2 down	Twill 2 up 2 down	1 face 1 back
Twill 2 up 2 down	Twill 3 up 1 down	1 face 1 back
Twill 2 up 2 down	Broken twill 3 up 1 down	1 face 1 back
Broken twill 3 up 1 down	Broken twill 3 up 1 down	2 face 1 back
Broken twill 3 up 1 down	Plain	2 face 1 back
Satin 5-leaf	Satin 5-leaf	2 face 1 back
Twill 3 up 3 down	Plain	3 face 1 back
Twill 3 up 3 down	Plain	2 face 1 back
Twill 3 up 3 down	Twill 2 up 1 down	2 face 1 back
Tricot long	Plain	4 face 1 back

FIG. 1341.

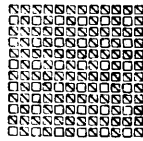


FIG. 1342.

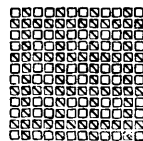


FIG. 1343.

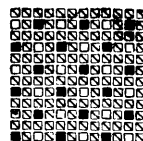


FIG. 1344.

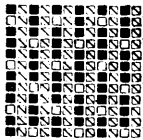
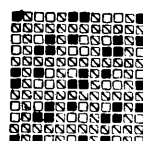


FIG. 1345.



FIG. 1346.

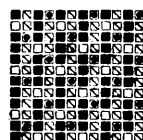


FIG. 1347.

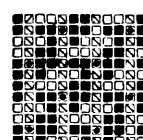


FIG. 1348.

The arrangement of face and back in the warp may be different from that in the filling. For example, the warp may be dressed 1 face, 1 back and the filling 2 face, 1 back, or the warp may be 3 or 4 face, 1 back, and the filling 2 face, 1 back. The object of such variations is to increase the proportion of filling in the goods, on account of the lower cost of the back filling, and to obtain a better cover on the back.

Weaves for double cloths are drafted as follows :

1. The spaces for the back threads are indicated by the diagonal lines, Figs. 1341 and 1342, in which

the set is 1 face, 1 back and 2 face, 1 back respectively. This is to distinguish the back threads from the face, and serves no other purpose. The back threads can be distinguished by any other means desired, such as painting the space instead of marking it.

2. The face weave is next drafted with black squares indicating warp risers, and blank squares for warp sinkers. For example, Fig. 1343 shows a plain woven face on Fig. 1341; Fig. 1344, a 2 up 2 down twill face on Fig. 1342.

3. All face warp threads are now raised above the back picks. This is shown by Fig. 1345 for Fig. 1343; by Fig. 1346 for Fig. 1344.

4. The weave intended for the back is drafted on the back warp and filling threads. The dotted squares indicate warp risers. Figs. 1347 and 1348 show a plain weave on the back of Figs. 1345 and 1346 respectively.

For cloths set 2 face, 1 back, the draft is usually begun 1 face, 1 back, 2 face, 1 back, etc.

All double fabric weaves are drafted in the manner just described. It is evident that face and back each form separate textures, which may be of different colors.

TUBULAR FABRICS

Tubular fabrics, such as lamp wicking, fire hose and seamless bags, are usually woven with a plain weave. The warp is made with an odd number of threads. For example, a warp for lamp wicking may be made with 67 ends, of which 34 are for the upper and 33 for the lower fabric. This arrangement is necessary to prevent two adjacent threads at the edge from being woven alike.

The double plain weave is shown at Figs. 1347 and 1358, the picks being thrown alternately on face and back. Two threads are drawn in the outside dent of the reed; 3 threads in each of the next two dents; and 4 threads in each dent for the rest of the warp. The object of the more open set at the edges is to counteract the tendency of the filling to contract more at the sides than in the center of the cloth.

Fire hose is often made of hemp yarn: warp, 3-ply; filling, 5-ply twisted slack. Two threads are drawn in each heddle. The filling is set very close, causing a warp take-up of 20 to 25 per cent. The weave is shown at Fig. 1347.

Bags without seams at the bottom are woven with 2 back picks alternating with 2 face picks. The shuttle passes from right to left and return. In this way the right side is closed, forming the bottom, and the left side is open, forming the top or mouth of the bag. The weave is shown at Fig. 1349.

Each side of the bag is closed by weaving the entire warp (face and back) for a short distance into a single fabric with the weave shown at Fig. 1353. The projecting edges are turned inside the bag.

Seamless bags are frequently woven like fire hose with the weave shown at Fig. 1347. At the beginning the whole warp is woven single for a short distance, as just described, to close the bottom of the bag. The sides are woven seamless and the edges at the top are hemmed after the bag comes from the loom.

Tubular fabrics are sometimes made to cover cylindrical objects. In Europe the cylinders of rotary cloth presses are sometimes covered with a tubular woven felt, which must be accurately made in order that the covered surface of the cylinder may be smooth.

The first and last three dents in the reed should each

FIG. 1349.



FIG. 1350.



FIG. 1351.



FIG. 1352.

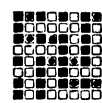


FIG. 1353.



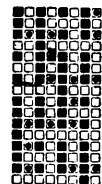
FIG. 1354.



FIG. 1355.



FIG. 1356.



have one third less threads than are drawn in the other dents. Thus if the body of the warp is reeded 6 threads in a dent, the edges should be reeded 4 in a dent. This is for the purpose of avoiding tight edges.

Usually these fabrics are woven with a 4-leaf twill, 2 up 2 down. In order that the twill may run in the same direction throughout the circumference of the tubular fabric, the twill of the upper weave is run in a direction opposite to that of the lower weave as both are viewed in the loom.

If this requirement is not observed, the twill in one half of the completed fabric will be to the left, that of the other half to the right. Fig. 1352 shows the draft

to be used for this purpose ; the upper twill is shown at Fig. 1350 ; the lower twill at Fig. 1351.

For very thick double felt the face and back are each woven with back filling, frequently with a broken 1 up 3 down twill, Fig. 1283. In drafting the weave the order for the filling threads should first be determined. Two methods are available. The two picks for the outer texture (the upper pick of the upper fabric and the lower pick of the lower fabric) can be inserted in succession, and followed by the two picks from the inner texture (the lower pick of the upper fabric and the upper pick of the lower fabric) ; or the two inner picks of the cloth (the lower pick of the face and upper pick of the back) can be woven first and then followed by the exterior picks of the cloth (upper pick of the face and lower pick of the back).

Figs. 1354, 1355 and 1356 show a broken 3 up 1 down back filling twill in the first-named order, Fig. 1354 being the face, Fig. 1355 the back, and Fig. 1356 the complete double weave. The upper picks of the face and the lower picks of the back weave form the filling on the outside of the tubular fabric.

REGULAR DOUBLE FABRICS

Double weaves are chiefly used, not for tubular goods, but to increase the weight and thickness of a fabric. For this purpose it is necessary that the two textures should be carefully and regularly stitched together, by interlacing the threads of one fabric with those of the other. This is accomplished either by raising the back warp above the face filling or by lowering the face warp below the back filling.

Raising the back warp above the face filling is called stitching from back to face. Lowering the face warp below the back filling is called stitching from face to back.

The method of stitching has great influence on the appearance and handle of the cloth.

Following are the principal points to be observed:

1. Uniform distribution of the stitchers.
2. The right number of stitchers. General rules on this point are as follows: For 1 face, 1 back weaves, 2 stitchers are inserted in an area of 8 threads square; for cloths set 2 face, 1 back, 2 stitchers are inserted in an area of 6 threads square; or, 2, 4 or 8 stitchers in an area 12 threads square.
3. So far as possible stitch with each back warp thread, when stitching from back to face.
4. Insert so far as possible each stitcher where the stitching warp thread is above both the preceding and following picks; also where both warp threads next to the stitching thread are likewise raised so as to cover the back stitcher. This rule refers to stitching from back to face.
5. Arrange the stitchers so as to disarrange the color pattern and weave as little as possible.

Most double cloths are stitched from back to face, because the back warp is usually finer than the back filling and is, consequently, covered better by the face threads when raised to stitch the fabric. Stitching from face to back brings the back filling to the face.

The simplest double weave is the double plain, shown at Fig. 1347 without stitchers. It is difficult to lay down a general rule as to whether a double

FIG. 1357.

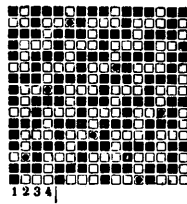
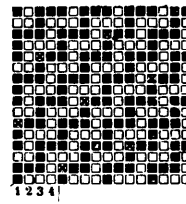


FIG. 1358.



FIG. 1359.

1 3 4 2
FIG. 1360.1 3 4 2
FIG. 1361.1 3 2 4
FIG. 1362.

plain cloth should be stitched from back to face or from face to back. The quality, color and size of both face and back yarn must be considered, as well as the arrangement of the colors in checks and stripes. If a double cloth is made with a dark back warp and a light-colored plaid on a dark ground on the face, stitching from back to face has a tendency to subdue the light colors of the face filling. Stitching the same cloth from face to back would, on the other hand, subdue the light colors of the face warp.

Fig. 1357 is a 1 and 1 double plain weave stitched from back to face; the stitchers are risers indicated by the dotted circles.

Fig. 1359 shows the same weave stitched from face to back, the crosses representing stitchers, which are sinkers.

The stitchers in both weaves are arranged regularly in 8-leaf satin order, but both have the defect, which is inherent in double plain weaves, that the stitching thread passes directly from one side of the cloth to the other. This is shown in Fig. 1360, which is a longitudinal section of Fig. 1357. The first four warp threads and the ends of 8 picks are shown.

In the sectional drawings, Figs. 1360, 1361 and 1362, the light threads are face warp; the dark threads, back warp.

Fig. 1361 is a longitudinal section of the 1 and 1 plain weave shown at Fig. 1359, stitched from face to back. This face-to-back method is objectionable in double plain cloths made with a coarse back filling because of the increased curvature of the stitching thread, which must pass under the back filling.

The curvature of the stitching thread is less where the weave of either face or back allows the stitching thread to pass on the same side of (above or below) two consecutive picks of the same texture (face or back).

Figs. 1362 and 1363 show this construction. The back weave is a 2 up 2 down twill; the face weave is plain. The stitching thread passes from back to face so as to bring it above both the preceding and succeeding back picks, bringing three risers together on the stitching thread. In this way the curvature of the stitching thread is gradual, as shown by the longitudinal section, Fig. 1362, instead of abrupt, as in Figs. 1360 and 1361.

The first four warp threads in each of the weaves, Figs. 1357, 1359 and 1363 are indicated by corre-