of water, the more dense the spray will be. To regulate this, an adjustable water-trough *K* is attached, the water being always kept at the same level by means of a ball tap. To get the water at the desired level, the trough *K* is worked up and down by means of suitable contrivances operated by a hand wheel situated at the front of the machine (See Fig. 5). Coupled to the water-trough by a connecting rod is a numbered gauge or quadrant so as to enable the operator to know at what height to have the water-trough to give the amount of spray required. There is also a tell tale glass gauge on the frame.

From explanations given the aim of the process will be readily understood, *viz:* a steaming of the fabric on face and back in connection with the water spraying apparatus. The steam opens the pores of the fibres, thereby increasing their affinity for absorbing the moisture produced by the nozzles.

A STUDY IN WEAVE FORMATION.

How to Construct 70 deg. Diagonals.

These diagonals, the same as those of 63 deg. grading explained in former issues of the Journal, have the regular, *i. e.,* 45 deg. twills for their foundation. The present system, however, only refers to warp drafting, no filling drafting being in this instance permissible. The angle, *i. e.,* steepness of the diagonal twill or cord effect will be more acute since in the present instance we only use every third warp-thread of the foundation twill, whereas in the construction of the diagonals having a 63 deg. grading, we used every other warp-thread of the foundation twill.

Using every third warp-thread of the regular twill only in the construction of a 70 deg. diagonal, will explain to us that any foundation twill having a multiple of 3 for their repeat will reduce to a 70 deg. diagonal repeating on one-third the number of harness required. For this reason a 12-harness regular twill will result in a (12 ÷ 3 =) 4-harness 70 deg. diagonal, etc. Provided the foundation twill is not a multiple of 3, no reduction in the number of harnesses required will take place and when, for example, a 13-harness foundation twill will produce a 13-harness 70 deg. steep twill, etc.

Weaves Figs. 1, 2 and 3 will illustrate the formation of such a 70 deg. diagonal from its foundation twill.

Fig. 1 is the foundation twill, a 45 deg. regular twill, repeating on 12 warp-threads and 12 picks.

Fig. 2 shows the previously given weave in two kinds of crochet type, *viz:* 1 end shown in *full* type to alternate with 2 ends shown in *dot* type.

Omitting the latter threads, *i. e.,* showing only the warp-threads given in *full* type (1, 4, 7, 10) in Fig. 2 side by side, gives us its 70 deg. steep twill, shown in weave Fig. 3, and which repeats on 4 warp-threads and 12 picks.

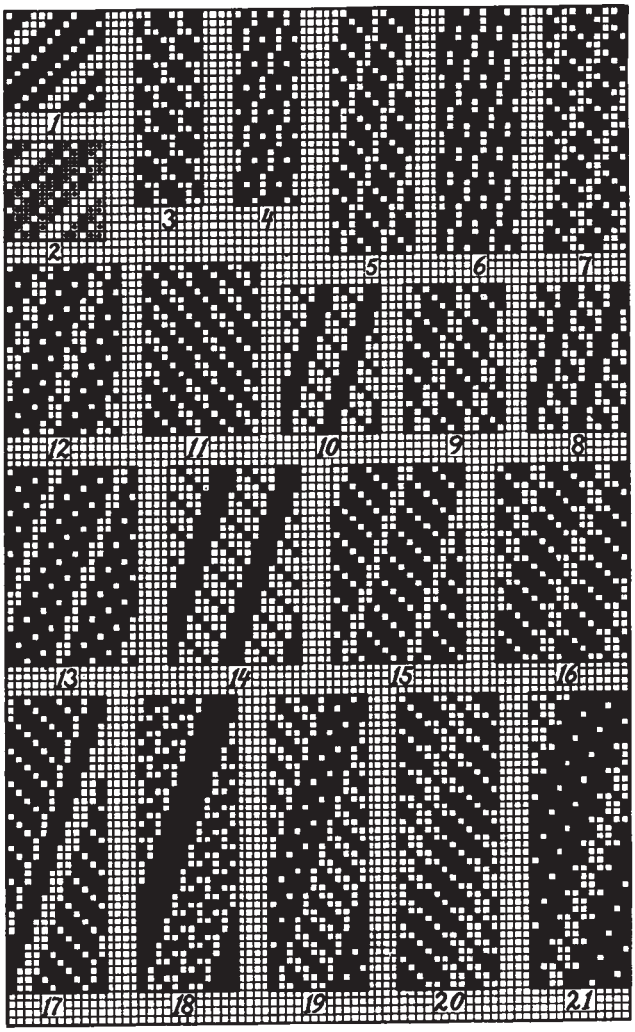
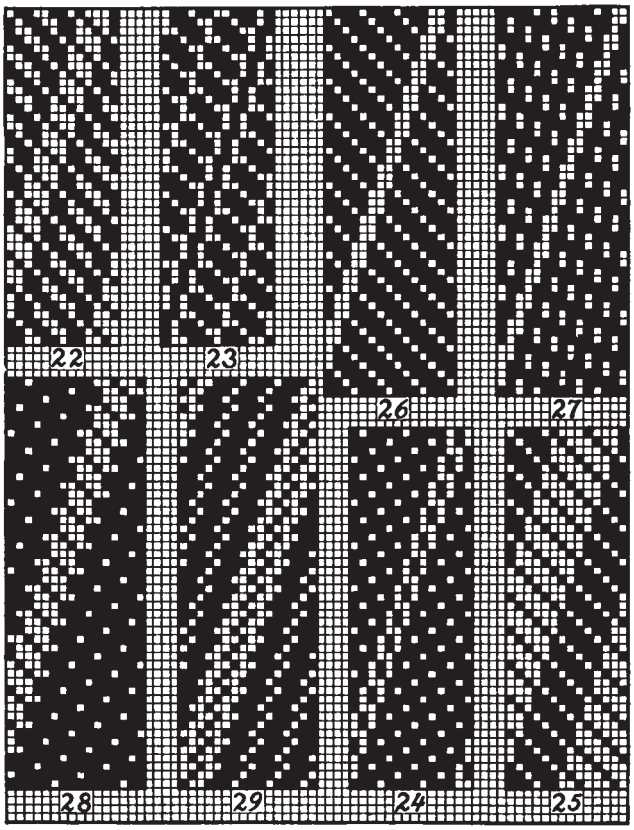


Fig. 4 shows us another 70 deg. twill, repeating on 4 by 12. Reading off the interlacing of the first warp-thread for the first 12 picks gives us the cycle of interlacing of the foundation twill and which in this instance is the $\frac{4}{3}\frac{4}{1}$ 12-harness regular twill.

Figs. 5, 6 and 7 show us in this manner the execution of three 70 deg. steep twills, repeating on 5-harness and 15 picks, having for their foundation 15-harness regular twills. Two repeats, warp and filling ways, of the steep twills are given.

Figs. 8, 9 and 10 show three examples of 70 deg. twills, repeating on 6 by 18, *i. e.*, having 18-harness regular twills, respectively for their foundation. One repeat warp ways and two repeats filling ways, of the steep twills are given.



Figs. 11 and 12 show two examples of 70 deg. twills, repeating on 7 by 21, with 21-harness regular twills, respectively for their foundation. We have shown again one repeat warp ways and two repeats filling ways, of the steep twills.

Figs 13, 14, 15 and 16 show four examples of 70 deg. twills, repeating on 8 by 24, and calling for 24-harness regular twills for their foundation. One repeat of filling and two repeats of warp-threads are given.

Figs. 17, 18, 19, 20 and 21 show five examples of 70 deg. twills repeating on 12 by 36;

Figs. 22 and 23 show two examples of 70 deg. twills repeating on 13 by 39;

Figs. 24 and 25 show two examples of 70 deg. twills repeating on 14 by 42;

Figs. 26 and 27 show two examples of 70 deg. twills repeating on 15 by 45; and

Figs. 28 and 29 show two examples of 70 deg. twills repeating on 16 by 48.

Only one repeat each way is shown in connection with weaves Figs. 17 and inclusive 29, on account of the large repeat of these weaves.

Solidonia Fibre.

Solidonia is a bast fibre which has already found application in many kinds of textile materials. The yarn prepared from it, is claimed has a beautiful lustre and a good tensile strength. The fibre is not used alone, but mixed with cotton and wool. Solidonia does not felt, and hence behaves like cotton when mixed with wool. The fibre can be bleached pure white, and can be dyed with any dyestuffs suitable for cotton. It is dyed at low temperatures and not above 80 to 90 deg. C., as the material becomes harder and more brittle at the boiling point. For the same reason the material should not be dried at high temperatures.

When dyeing with the direct, the developed direct colors, and sulphide dyes, the addition of soap is advantageous to maintain the soft handle of the goods and aid in the production of even dyeing.

In the case of the direct colors 10 to 20 per cent of sulphate of soda and 1 to 2 per cent of soap are added to the dyebath, into which the material is introduced at 40 deg., slowly warmed to 80 to 90 deg. C., and dyed for one hour.

The developed direct colors are dyed in a similar manner, then diazotized and developed.

The sulphide colors are dyed with the addition of 4 to 8 per cent soda ash and 1 to 2 per cent soap at the temperatures named.

Fastness to Acid.

Dyed wool may be tested for fastness to acid by working a small skein in a six degrees Tw. sulphuric acid solution until saturated and dry without washing for one to two hours at 110 degrees C.

Alkali Test for Wool.

Work the dyed material in a two per cent. solution of soda ash for one hour at 140 degrees F. and then rinse and dry.

The freight charges on cotton shipped direct from here to Bremen, Germany, is now about $12 per bale, compared to $4 per bale in time of peace.