where colored threads may be effectively introduced, *viz:*

First, where the long floats are formed on the surface of the fabric by warp and filling, and where the colors follow the ridges and show very distinctly on the surface in the form of a small check, and—

Second, when the colors are brought to the surface where warp and filling interlaces with the plain weave, each set of threads, in the repeat of the pattern, at other places being covered, *i. e.,* hidden from showing on the surface, by the long floats of its respective set of mate threads, with the result that small colored spots are formed at the bottom of the cells.

Diagram Fig. 6 is given to explain subject in connection with weave Fig. 2 where in the former *full* type shows the first kind of effect, *i. e.,* the small checks formed by warp and filling floats. *Dot* type shows two small spots produced, *i. e.,* the second kind of effect previously referred to.

Either effect may be used by itself; again, both effects combined may be used in one fabric structure.

(*To be continued.*)

CRÊPE WEAVES.

(*Continued from page 145.*)

Dovetailing Twills or Satins.

Another way of obtaining crêpe weaves is by dovetailing, *i. e.,* intermixing, two weaves. The best results are obtained by combining two weaves of one system, like for example, a twill with a twill, a satin with a satin, etc., although some of these crêpe weaves may have the combination of two systems of weaves, like for example, a twill and a granite, etc., for their foundation.

Rule: In constructing these crêpe weaves, draft alternately one or more warp-threads from one of the foundation weaves, and then one or more warp-threads from the other foundation weave; continue this drafting until both foundation weaves are at the same time used up, and when the repeat of the new crêpe weave is obtained.

Drafting in this manner two 8-harness foundation weaves 1 : 1 will result in a crêpe weave repeating on 16-harness; drafting two 8-harness weaves 2 : 1 will result in a crêpe weave repeating on 24-harness, since one of the foundation weaves will have to be used over twice, before its mate is used up once, etc.

A few practical examples will readily explain the subject.

Combining Two Twills.

USING THE SAME FOUNDATION WEAVE STARTING EACH DIFFERENTLY.

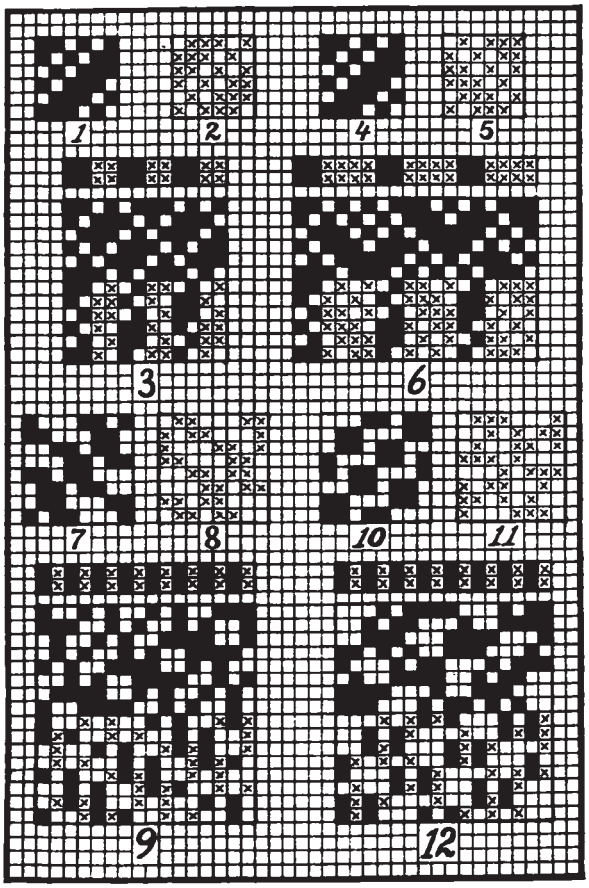
To simplify matters, each of the two foundation weaves, in every one of our examples is shown in a different type, and this corresponding to the type used in the drafting scheme given in every instance above the respectively resultant crêpe weave.

Fig. 1, one repeat of the $\frac{3}{1}\frac{1}{1}$ 5-harness twill; shown in *full* type.

Fig. 2, the same 5-harness twill as Fig. 1, only started with a different warp-thread; shown in *cross* type.

Fig. 3 is the crêpe weave obtained from weaves Figs. 1 and 2, drafting 2 warp-threads taken in rotation from weave Fig. 1 alternately with 2 warp-threads taken from weave Fig. 2, as indicated in draft scheme given above the crêpe weave. Both foundation weaves are uniformly used up by being drawn over once, hence $2 \times 6 = 12$, repeat of draw of crêpe weave.

In connection with this drafting it will be noticed, that the last two ends of weave Fig. 1 (warp-threads 9 and 10 of the crêpe weave) are the same as the first 2 ends of weave Fig. 2 (warp-threads 3 and 4 of the crêpe weave) and as both weaves are twills, running in the same direction, each successive warp-thread interlacing the same, only starting one pick



higher—it follows, that in this instance warp-threads 3, 4, 5, 6, 7 and 8 of the crêpe weave (since 9 and 10 = 3 and 4 as above mentioned) form its repeat; hence 6 warp-threads and 6 picks the repeat of crêpe weave Fig. 3.

Drafting weaves Fig. 1 and 2 in position given 1 : 1, will produce an excellent crêpe weave, repeating on 12 warp-threads. The same will be the case if we retain drafting 2 : 2 but change position of starting of weave Fig. 2, for example change its first warp-thread to be the last, and when then the resulting crêpe weave will also repeat on 12 warp-threads.

USING THE SAME FOUNDATION TWILL RUNNING THEM IN OPPOSITE DIRECTIONS.

Fig. 4, the same 6-harness twill as Fig. 1, with the twill line running from left to right; shown in *full* type.

Fig. 5, the same 6-harness twill as Fig. 2, but running the twill line in the reverse direction; shown in *cross* type.

Fig. 6, the new crêpe weave obtained by drafting: 2 ends from weave Fig. 4 to alternate with 4 ends from weave Fig. 5, as shown by drafting scheme above crêpe weave, executed in corresponding type to that of the two foundation twills. Repeat of crêpe weave Fig. 6 is 12 warp-threads and 6 picks.

Combining Two Granite Weaves.

USING THE SAME FOUNDATION WEAVES STARTING EACH DIFFERENTLY.

Fig. 7, one of our most popular 8 by 8 granite weaves; shown in *full* type.

Fig. 8, the same granite weave as Fig. 7, but started with a different warp-thread (warp-thread 7 in Fig. 7 = warp-thread 1 in Fig. 1, etc.) shown in *cross* type.

Fig. 9 the crêpe weave obtained from weaves 7 and 8, by combining them 1 : 1, as shown in drafting scheme above the crêpe weave, the latter repeating ($2 \times 8 =$) 16 warp-threads and 8 picks.

USING TWO DIFFERENT GRANITE WEAVES IN THE FORMATION OF THE CRÊPE WEAVES.

Fig. 10, a most frequently met with granite weave, repeating 8 by 8; shown in *full* type.

Fig. 11, another often met with granite weave, repeating also on 8 by 8; shown in *cross* type.

Fig. 12, the crêpe weave obtained from weaves 10 and 11, by combining them 1 : 1, as clearly indicated by drafting scheme given above the crêpe weave, which repeats on 16 warp-threads and 8 picks.

Printing Viscose on Textile Fabrics.

It has been found difficult in the past to print viscose on a fabric so as to give a regular and uniform film, capable of resisting mechanical strain.

According to a late invention of the Calico Printers' Association of England, however, it has been found that if the fabric is first impregnated with a weak acid, acid salt, or salt of a volatile base, and dried, on printing the viscose solution containing excess of alkali, the cellulose can be fixed on the fabric by dry heat, steaming, or spontaneous evaporation.

As an example, the fabric is padded with a 4 per cent. solution of ammonium sulphate and dried. It is then calendered to give it a smooth hard surface. A suitable viscose solution (one containing, say, 10 per cent. cellulose, 5½ to 7 per cent. caustic soda, and 8 to 10 per cent. china clay) is then printed on the fabric.

The fabric is then dried and passed through a continuous ager for three minutes at 208 deg. F., for the purpose of fixing the viscose.

The fabric may then be washed at once, or allowed to lie a day or two before washing.

THE MANUFACTURE OF NARROW WARES.

Ribbons, Trimmings, Edgings, etc.

(*Continued from page 150.*)

DOPPIONE SILK is coarse and uneven, and as a rule, of a light yellow color. This silk is reeled from double cocoons, *i. e.*, where the worms have spun their cocoons side by side, and so joined that it is necessary to reel the cocoons together, the end of neither cocoon being free without the other. The production is comparatively small, and its unevenness makes it unsuitable for a good class of work; hence its use is confined to the manufacturing of the cheapest materials where heavy counts of yarns are used.

Spun or Chappe Silks.

The product known as spun, chappe, or filoselle silk is obtained from the following classes of silk waste: (1) The coarse, loose, outer layers surrounding the true cocoon; (2) the cocoons that are defective or from which the moth has escaped, and which are therefore difficult or impossible to wind; also doubled cocoons and those from diseased larvæ (choquettes); and (3) the parchment-like skin (strusa) left behind on winding the sound cocoons.

By means of a troublesome spinning process these waste products are converted into coarse inferior yarns, the sericine being first destroyed by maceration, and the mass then washed successively with hot and cold water. When dry, the purified material is separated into fibres, more or less short, and finally converted into yarn by combing, roving, and fine spinning.

Spun silks are calculated as to the size of the thread, on the same basis as cotton (840 yards to 1 hank), the number of hanks one pound requires indicating the counts. In the calculation of cotton, woolen or worsted, double and twist yarn, the custom is to consider it as twice as heavy as single; thus double and twisted 40's (technically 2/40's) cotton, equals single 20's cotton for calculations. In the calculation of spun silk the single yarn equals the two-fold; thus single 40's and two-fold 40's require the same number of hanks (40 hanks equal 33,600 yards). The technical indication of two-fold in spun silk is also correspondingly reversed if compared to cotton, wool and worsted yarn. In cotton, wool and worsted yarn the 2, indicating the two-fold, is put in front of the counts indicating the size of the thread (2/40's), while in indicating spun silk this point is reversed (40/2's), or in present example single 80's doubled to 40's.

A lower grade of spun silk is known as BOURETTE SILK, which is obtained from working up combings (stumba) of spun silk and the product naturally occupies the lowest position among silk yarns. It is graded the same as spun silk.

Artificial Silks.

There are three class of artifical silk met with:

(*a*) COLLODION SILK also known as *Chardonnet* silk, named after its inventor, it being the first artificial silk brought in the market.

(*b*) CUPRAMMONIUM SILK, also known as *Pauly, Linkmayer*, and more often as *Thiele* silk.

(*c*) VISCOSE SILK, also known as *Cross & Bevan*, and *Stearn* silk.

The characteristic properties of natural silk, which render it so much esteemed as a textile material, are its beautiful lustre, softness, elasticity, strength, and