

### CORKSCREW TWILLS.

The same are twilled warp ribs, and are used either alone or in combination with other weaves for a variety of purposes. Similar to warp rib weaves they require a high warp texture, in order to produce a full face, since only about one-half of the warp-threads form the face, while the others form the back, the filling resting embedded between said warp-threads.

These weaves are more regular in their construction, when their repeat contains an odd number of threads, 5, 7, 11 and 13 being the weaves most frequently met with.

Corkscrew twills are obtained from our regular twills by means of double drafting, the lowest number of harnesses to use being 5, after which they can be designed for any number of harnesses, as the case may require.

Figs. 1, 2 and 3 are given to illustrate the construction of a corkscrew twill from its foundation twill, viz:

Fig. 1 is the  $\frac{3}{2}$ -5-harness regular twill, which is the foundation for the 5-harness corkscrew, to be obtained from it by means of double draw given in Fig. 2, the double drafting being shown in two kinds of type in order to simplify matters.

Fig. 3 is the 5-harness corkscrew, shown in two kinds of type to illustrate the double drafting practiced in obtaining it. Repeat of weave: 5 warp-threads and 5 picks. In some instances, more particularly in connection with light-weight worsteds, this weave is used risers for sinkers, *i. e.*, interlacing warp threads  $\frac{2}{3}$ , forming in this instance, by means of the *two* warp-threads (side by side) down, somewhat of a granite effect, by the filling showing on these spots on the face of the fabric, said spots being distributed after the 5-leaf satin motive. In this instance a somewhat less high warp texture may be employed.

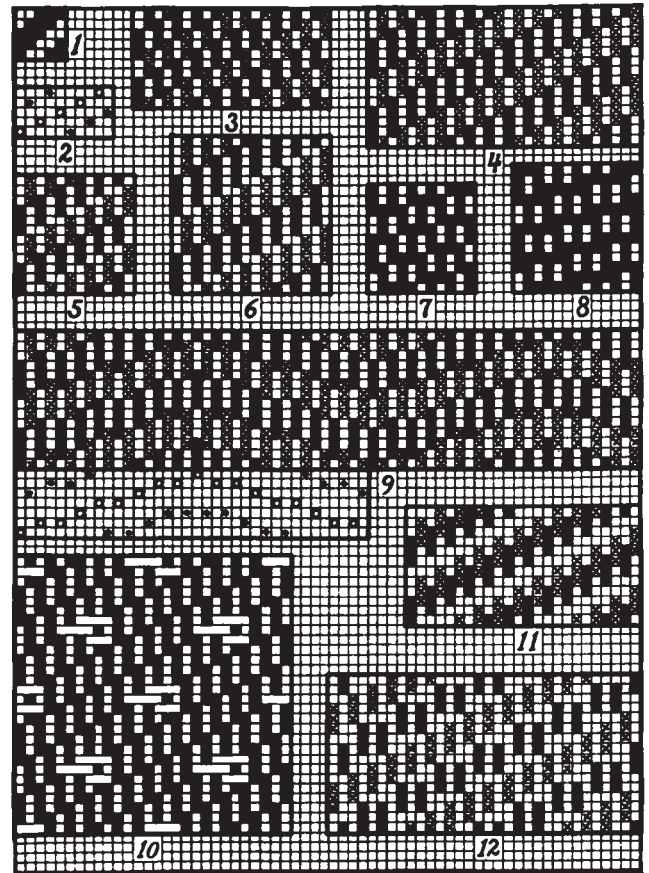
Fig. 4 is the 7-harness corkscrew twill obtained from its mate the  $\frac{4}{3}$ -7-harness twill by means of double drafting.

As mentioned before, corkscrew twills are always better made with uneven number of warp-threads for its repeat, however, in connection with certain fabric structures such as repeating on an even number of warp-threads may be required. For instance, in a fancy worsted trousering where sections of fabrics interlace with, for example, the  $\frac{3}{3}$ -6-harness twill, the same may have to exchange with portions of fabrics interlaced with corkscrew twills, and when naturally a 6-harness corkscrew twill may by preference have to be used in connection with the 6-harness twill in order to not increase the number of harnesses used in the loom, producing in this instance the twill by a straight draw, and the corkscrew by a double draw, from the same portion of the harness chain.

Weaves Figs. 5 and 6 illustrate the subject, showing respectively the 6 and 8-harness corkscrew twills, obtained respectively from their mate twills, the  $\frac{3}{3}$ -6-harness and the  $\frac{4}{4}$ -8-harness regular twill.

Comparing these two corkscrew twills of an even repeat of warp-threads with weaves Figs. 3 and 4, will show us that in connection with those of an even repeat we cannot produce a uniformly prominent cut line between the two twill effects; one of the cut lines will show by means of two sinkers side by side, vice versa, two raisers side by side for the other cut effect.

With reference to 11 and 13-harness corkscrew twills, the same have for their foundation regular twills showing two twill effect lines in one repeat of the weave, using for the 11-harness corkscrew (see Fig. 7) the  $\frac{4}{2}$ - $\frac{3}{2}$  11-harness twill, and for the 13-harness corkscrew (see Fig. 8) the  $\frac{5}{2}$ - $\frac{4}{2}$  13-harness regular twill. In connection with these two corkscrew twills a satin draw is used to obtain either one from its respective foundation twill, *i. e.*, "miss 4-harness" in drafting for either weave, and which in connection with the 11-harness twill will give us 1, 5, 9, 2, 6, 10, 3, 7, 11, 4, 8 (or the 11-harness satin) as the drafting for its mate corkscrew. For the 13-harness corkscrew the drafting from its foundation twill is 1, 5, 9, 13, 4, 8, 12, 3, 7, 11, 2, 6 and 10, or the 13 leaf satin.



Figured Effects.

The same comprise wavy effects, spot effects, three (or more) color twill effects, and figured effects. One example of each is given.

Fig. 9 shows us a wavy corkscrew twill, having for its basis the 7-harness corkscrew twill shown previously in Fig. 4. The draft below the weave will clearly show how the wavy effect for this weave is obtained, explaining at the same time how to design others by it. Repeat of weave 36 warp-threads and 7 picks; 7-harness fancy draw.

Fig. 10 shows spotting by the filling upon the 7-harness corkscrew twill, *i. e.*, changing a certain number of risers of the repeat of the weave after a given motive to sinkers. In the present instance five raisers had been changed to sinkers in sets arranged after plain setting, using one repeat of the weave for each set of the spotting; hence, repeat of complete weave, 14 warp-threads and 14 picks.

Fig. 11 shows a *three color twill* effect, of which two are produced by means of the warp (see *full* type and *cross* type respectively) the third by the filling (see *sinkers*).

Fig. 12 illustrates the producing of a *figured effect* in the formation of a corkscrew twill. Our example shows us as the standard effect a smooth twill (see *cross* type) formed by the warp-threads being up over 3 picks; between these twills a basket weave effect is run up diagonally, the individual baskets overlapping each other by one pick as they advance. The filling will show between the places where two of the baskets come in contact with the standard twill, in the shape of spots.

#### Faults in Dyeing and How to Correct Them.

No matter what care and precaution that may have been exercised, faults will sometimes arise in dyeing. The goods may come out too deep in shade, unlevelled, spotted, or not properly matching the standard pattern. Faulty lots, when they do occur, require to be handled subsequently with great care, so that when the faults have been remedied the goods will not show any apparent signs of the extra treatment they have passed through, and shall still be serviceable for the purpose originally intended. It is, therefore, necessary that the fibre or the cloth should not have been in any way weakened by the *cobbling* operations; woolens should not have been felted; and silks and half-silks should not have been impaired in point of brilliancy. In other words, the characteristics proper to each fibre or fabric should not have been altered.

In the majority of cases of re-dyeing, satisfactory results may generally be expected when the operations of stripping and of re-dyeing have been properly controlled by experience.

In large mills where it is the custom to keep large stocks of the grey material, it is often possible to pass on badly dyed goods to be dyed some deeper color and to take fresh material to replace the faulty. Wherever it is possible this course is a very convenient one, and is also the more economical; but it is not always available.

The methods to be adopted for the remedying of faults depend upon the nature of the material:

- a Vegetable fibres (cotton, jute, linen, ramie, hemp, and artificial silk);
- b Animal fibres (wool and silk);
- c Mixtures (wool and cotton, silk and wool, silk and artificial silk).

Materials composed of the vegetable fibres may have been dyed with the acid and azo coloring matters, with the basic dyestuffs, mordanting with tannin followed, or not, by fixation with tartar emetic, with the direct dyestuffs, with the developed coloring matters, or with the alizarine dyes in oiled material mordanted with metallic salts.

The dyeings on vegetable fabrics made with the acid and azo dyestuffs come into consideration only on special occasions, as these dyes are used solely because they give a brilliancy of tone which cannot be otherwise attained. They are mostly used on ribbons for the production of shades of cream, pink, claret, and

red, and for this purpose there are eosine, phloxine, erythrosine, croceine scarlet, etc. These dyes are generally applied from a warm bath strongly charged with sulphate of soda, and the material after dyeing is at once squeezed and sent to dry without being washed. They are not fast to washing, and often appear bronzed when dried. The remedy for any faults is therefore a simple course of washing and of re-dyeing.

Most of the other coloring matters named may be regarded as fast to soaping. With these, the remedying of faults consists in treating the dyeing with a solution of bleaching powder and then of acid, stripping with hyraldite or with acidified bichromate of potash.

Stripping with bleaching powder solutions gives satisfactory results in a large number of cases. The faulty material is worked for a short time in a warm but weak solution of chemic, and then without washing passed through a cold weak bath of acid, sulphuric or hydrochloric. A course of this treatment usually suffices to cause total decolorization, but should this not have taken place the operations may be repeated. After souring, the material requires to be washed and is then treated with soda to neutralize the acid, and soaped to remove any traces of hypochlorite. After washing again the goods are ready to be re-dyed.

Those coloring matters which are fast to chlorine can usually be stripped by means of hyraldite. Faultily dyed material may be very satisfactorily stripped with this agent by applying it at a temperature of about 170° F. The goods require, however, to be manipulated for about half an hour. To effect the removal of traces of hyraldite and of the odor from the treated material, washing is succeeded by treating for a short time with a warm but weak solution of bleaching powder, or with a solution of peroxide of soda, or acidified bichromate of potash. In some circumstances, treating for half an hour in a warm solution of acidified bichromate suffices to prepare the material for re-dyeing, without any previous treatment.

The re-dyeing of fabrics composed of animal fibres presents more danger and complications, and requires more time than the re-dyeing of cottons, etc., calls for, because the wool fibres tend to contract, to felt, and lose some of its appearance by the treatment. The acid and azo dyestuffs are usually applied to woollen materials for ladies' cloths, and with these it often suffices to treat with a boiling solution of sulphate of soda or of ammonia with the object of effecting the removal of the color. Stripping by means of a warm solution of soap when serviceable is rather to be avoided, because of the liability of causing the felting of the fibre.

Silk materials are generally dyed with the aniline or the naphthaline dyestuffs, and when these have to be considered decolorization of the dyed material may be brought about by treating with a warm solution of soap, or, better, with a warm and sufficiently strong solution of washing soda, containing also a very weak proportion of caustic soda. In some particular cases this treatment may not turn out satisfactorily, but