Posselt's Textile Journal

Vol. XI. October, 1912. No. 4

DESIGNING AND FABRIC STRUCTURE.

NOVELTIES IN WORSTED TROUSERING.

(Finished Width 56")

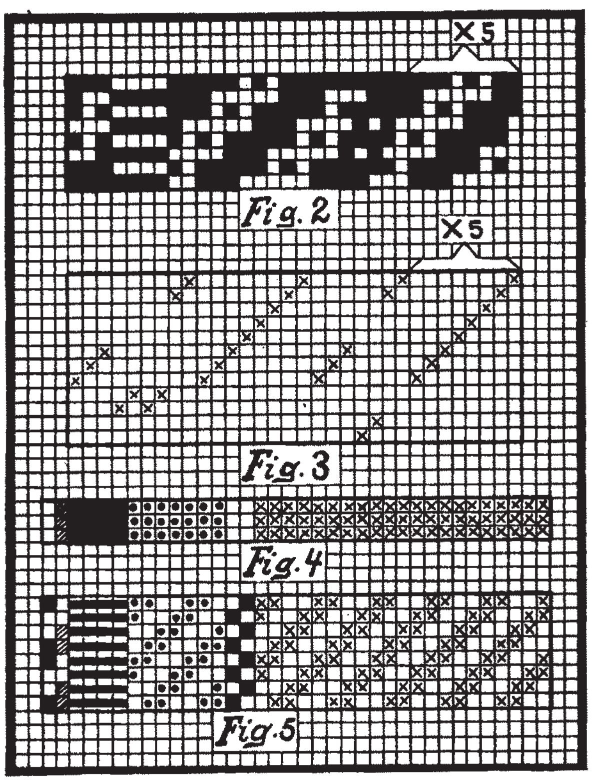
Fig. 1: Reproduction of fabric, actual size.

Fig. 2: Weave, Repeat 64 warp-threads and 8 picks.

Fig. 3: Drawing-in Draft; 12-harness, fancy draft.

Fig. 4: Color Scheme for face weave only; back warp-threads omitted. In the same:
Empty type indicates white silk
Shaded " " green worsted
Full " " black worsted
Dot " " black & gray mix worsted
Cross " " white & gray mix worsted.

Fig. 5: Complete repeat of face weave, placed corresponding to its color scheme. Below this weave the position where the (28) back warp-threads are situated in the fabric structure is indicated by (28) short



dashes. Repeat of face weave 36 warp-threads and 4 picks. The four ends rib weave (cord) are shown partly empty, since by nature of this weave the back pick of the twill double cloth structure forms the face pick in the rib.

Warp: 8192 ends.

Dress: 16 sections, each to contain 8 patterns @ 64 ends, or 512 ends total.

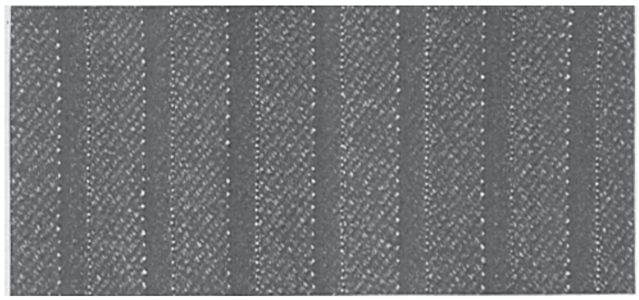


Fig. 1

Arrangement of Colors for Complete Warp:
1 end 80/2's spun silk, white
2 ends 2/48's worsted, green
4 " 2/40's worsted, black
13 " 2/60's worsted, black & gray mix
2 " 80/2's spun silk, white
42 " 2/60's worsted, white & gray mix
—
64 ends in repeat of pattern.

Colors for Face Warp Only:
1 end white spun silk
1 " green worsted
4 ends black worsted
7 " black & gray mix worsted
2 " white spun silk
21 " white & gray mix worsted
—
36 ends repeat, and which with the 28 ends of back warp, equals the total of 64 ends in repeat if complete dressing.

Reed: 15½ with 8 ends per dent, or 124 ends per inch; 66 inches wide in reed, exclusive of selvage.

Filling: 110 picks per inch, all 2/60's worsted, black.

Finish: Worsted finish; scour well, clear face to show pattern distinct.

FABRIC ANALYSIS.

(Continued from page 38).

V. To Ascertain Texture Required in Loom.

Of all the different points required to be ascertained in the analysis of a fabric, the present is probably the most difficult to master, and can only be accomplished after considerable practical experience.

To simplify your work, make a collection of a variety of samples of finished fabrics of which you know the exact shrinkage from reed to finished width. Such a collection of samples will afterwards guide you in the laying out for the loom of similar fabrics.

Shrinkage of a Fabric in Width from Loom to Finished State.

The *setting* of a fabric in the loom, *i. e.,* the reed-space the warp must occupy at weaving, compared to the width of the fabric in its finished condition, is regulated by the raw material used, the manner in which the yarn has been produced, and the different processes the fabric has to be subjected to during finishing.

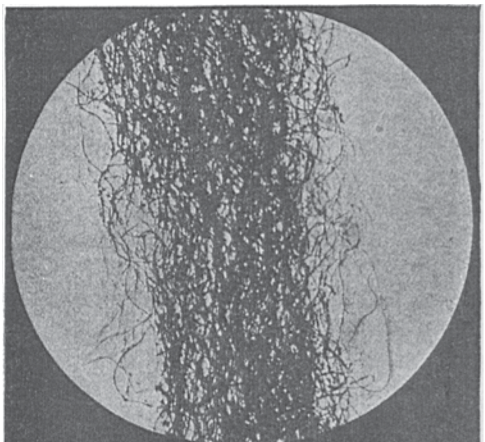


Fig 39

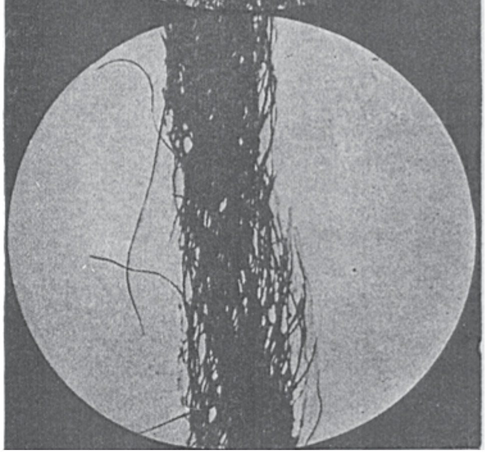


Fig. 40

The setting of cotton and silk fabrics in the loom, as a rule, make little trouble to the designer, since then the width from the loom is about the width of the fabric when finished.

This however differs when dealing with woolens and worsteds.

Some kinds of woolen fabrics require a large amount of fulling, hence must be set wider in the loom than other woolen goods requiring little or possibly no fulling. For example, the best grades of billiard-cloth must be *set* nearly twice as wide in the loom as its finished width, while beavers, kerseys, and similar woolen fabrics need to be *set* but about one-half their finished width wider, and fancy cassimeres from one-quarter to one-third. Worsteds require a less wide setting compared to woolens; about $\frac{1}{6}$th to $\frac{1}{5}$th wider than their finished width.

Besides the kind of yarn used in the construction of a fabric, the weave used has also a considerable influence in regulating the setting of a certain fabric in the loom.

These general rules are worthy of consideration: The finer the quality, and the less twist inserted into the filling, the more the cloth will shrink at the fulling process in its width. If the filling is hard twisted, and of a coarse quality of stock, such cloth will have but little tendency to shrink.

If the weave has a far apart interlacing, this will have a tendency to produce a narrower fabric than when the texture is more closely intertwined.

The less tension we put on the warp during weaving (take-up) the narrower the fabric will become.

In comparing woolen and worsted yarn (see Figs. 39 and 40) the former produces fabrics which shrink more in width than fabrics made with worsted yarn. This result, when produced from the same raw material, is based upon the two different processes (carding or combing) the wool fibres respectively are subjected to in their manufacture into yarn. By carding the wool, every fibre, through mixing up in every shape and direction, is twisted in itself (see Fig. 39) and such fibres always endeavor to resume their original position. By worsted combing, the wool fibres are separately united in the formation of the yarn, *i. e.,* each fibre, as placed in position for forming the thread, remains more or less its own (see Fig. 40) for which reason such a thread remains undisturbed in the fabric, and when fabrics made out of such threads will keep wider than if using a wool-spun yarn of the same quality and count, under similar conditions.

Take-up of Warp During Weaving, and Shrinkage of Fabric in Length During Finishing.

We must also carefully consider the amount of take-up the warp is subjected to during weaving, and the amount of shrinkage in length the cloth undergoes during the finishing process. The latter point will not come into consideration in the case of fabrics which are ready for the market or require only a slight finishing after leaving the loom, some of which, by means of pressing or calendering under tension, may actually become longer by this process.

The take-up of the warp during weaving varies from fabrics requiring two, three, four or more times the length in dressing than the fabric length woven, to fabrics in which the warp-length dressed equals the fabric length or, if any difference, to be very little; again in some special cases the warp may stretch sufficiently to produce more yards woven than was dressed.

Points given previously on the shrinkage in width of a fabric also apply to the shrinkage of the fabric in length. The weave and the number of picks per inch used are the chief objects regulating the take-up of the warp during weaving; for example, a fabric interlaced with a far stitching satin (say 8 to 12-harness) will take up very little, if any at all, unless we use an unusually high texture of warp and filling. Thus, the oftener a warp-thread intersects the filling in a given distance, the greater the amount of take-up required for the warp. For this reason, fabrics which have two systems of weaves combined (for example, 1-inch plain weave to alternate with 2-inch 8-harness satin= 3 inches repeat, 10 repeats in width of fabric) require two beams; one beam to carry the warp for weaving the plain, and one beam for carrying the warp for weaving the satin. This also applies to worsted fabrics made with woolen back-warps, or such where the face-warp interlaces different from that of the back-warp, like for example, a 4-harness twill for the face, and an 8-harness satin for the back, in most instances will call for two beam work on account of the difference in the take-up of the two systems of warp threads. Double cloth, wool or worsted face warp used in connection with a cotton back warp will also call for two beam work.

The amount of shrinkage in warp pile fabrics, for its pile-warp is considerable. It is regulated by the height of pile required, the amount of wires or loops per inch, etc. Such fabrics may often require their pile-warp dressed four to eight times longer than the piece measures woven.

To ascertain the exact percentage of take-up for a fabric needs experience, and can only be mastered by a thorough study of the theory of constructing the different weaves, the nature of the various raw materials, their various methods of preparing the yarn for the loom, and the different processes of finishing.

(To be continued.)

DIAGONALS.

The same are one of the most important system of weaves used in the woolen, worsted, cotton and silk industry. The object aimed at in designing these weaves is to produce more prominent, besides steeper twill effects in the fabric than our regular twills will show.

On account of the steeper twill effect produced, compared with regular twills, Diagonals are also technically called Steep Twills.

As a rule, Diagonals are obtained by means of *warp drafting* from the regular twills; in some instances *filling drafting* is resorted to, but the first mentioned procedure will produce better and quicker results.

To more readily explain the construction of these Diagonal weaves, the accompanying collection of weaves is given; the first three weaves show one repeat, the last two weaves two repeats.

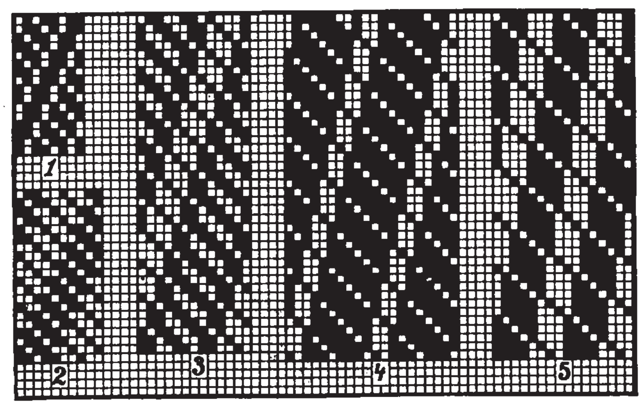
Diagonals are classified in such as showing a steep twill effect of what we technically term 63, 70, 75, and 80 degree grading respectively, by what is understood that the twill effect of the Diagonal considered on the point paper, runs at one or the other of the four degrees quoted. As will be readily understood, this degree of the steep twill effect changes in the fabric from that shown on the point paper. It may become more or less oblique, depending upon the warp and filling texture used in the construction of the fabric, whereas on our regular point paper used for the construction of these weaves, the same is considered as balanced. By this is meant that (considering the point paper design, *i. e.*, warp and filling texture in the fabric balanced) the higher the warp texture to that of the filling, the more oblique the steep twill effect will appear in the fabric, *vice versa*, the lower the filling texture to that of the warp, the less oblique the twill effect will be.

63° Grading Effects.

Two examples of this are given.

Fig. 1 shows us a Diagonal having the $\frac{4}{2}\frac{2}{1}\frac{2}{1}\frac{2}{2}$ 16-harness regular twill for its basis, using every alternate warp-thread only in the formation of the Diagonal, *i. e.*, every uneven number warp-thread of the twill is used, and every even number warp-thread of it is dropped, resulting in a Diagonal repeating on 8 warp-threads and 16 picks. No reduction in the picks takes place.

This Diagonal can also be obtained by filling drafting, *i. e.*, combining the $\frac{2}{1}\frac{2}{1}\frac{1}{1}$ 8-harness twill,



pick for pick, with itself, starting with a different pick in either foundation, thus:

1 6 **2** 7 **3** 8 **4** 1 **5** 2 **6** 3 **7** 4 **8** 5.

Fig. 2 shows us another 63 degree grading effect, the same having the $\frac{2}{1}\frac{2}{1}\frac{2}{1}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{1}$ 20-harness regular twill for its basis, using the same as before, only every other warp-thread in the construction of the Diagonal. Filling Drafting, as explained in the previous example, can be also used for obtaining Diagonal given in Fig. 2. In this instance the $\frac{2}{1}\frac{2}{2}\frac{1}{2}$ 10-harness regular twill is the foundation (double drafting) for Diagonal Fig. 2; repeat 10 warp-threads and 20 picks.

70° Grading Effects.

One example, Fig. 3 will suffice. Regular twills are again the foundation; in this instance it is the $\frac{3}{1}\frac{3}{2}\frac{2}{2}\frac{2}{2}\frac{2}{2}\frac{3}{1}\frac{3}{3}\frac{1}{3}\frac{1}{3}$ 39-harness twill. Every third warp-thread of this regular twill only is used (successively combined) in the formation of the Diagonal, resulting in a repeat for the latter of (39 divided by 3, equals) 13-harness and 39 picks.

75° Grading Effects.

Diagonal Fig. 4 is given to illustrate subject. In this instance only every fourth warp-thread of the