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DESIGNING AND FABRIC STRUCTURE.

TO INCREASE BULK OF FABRIC BY MEANS OF THE WARP WITHOUT ADDING A SPECIAL BACK WARP.

The purpose of this method of designing is to produce a back to single cloth structures by means of its own warp, *i. e.* every warp thread constituting the fabric is used part the time during the repeat of the weave for interlacing with the filling in forming the face of the fabric, floating during the remainder of the repeat of the weave on the back of the fabric, forming then a backing to the structure.

This method of fabric structure will consequently call for a high warp texture, to use which, in turn, will call for high counts of yarns, a feature which will readily explain that this system of designing heavy weight fabrics is more particularly adapted for the manufacture of the better grades of worsted trouserings and suitings, although it may be also met with in cheaper grades, cotton worsteds, etc.

This system of weaves is used in the manufacture of worsted trouserings and suitings in place of the system where the bulk to the fabric is produced by means of a special back warp, *i. e.* using then a face and a back warp in the construction of the fabric.

The present system of weaves, compared to the latter system, will produce a smoother face to the fabric, the same being also of a softer and more pliable nature, since the warp threads in forming face and back of the structure do not lie exactly parallel above each other, *i. e.* by means of their changing from forming face and back of the structure, and vice versa, weaves of the present system, produce a fabric bulkier in appearance and handle compared to a corresponding fabric made with a face and back warp. Only one system of filling is used with either method of fabric structure.

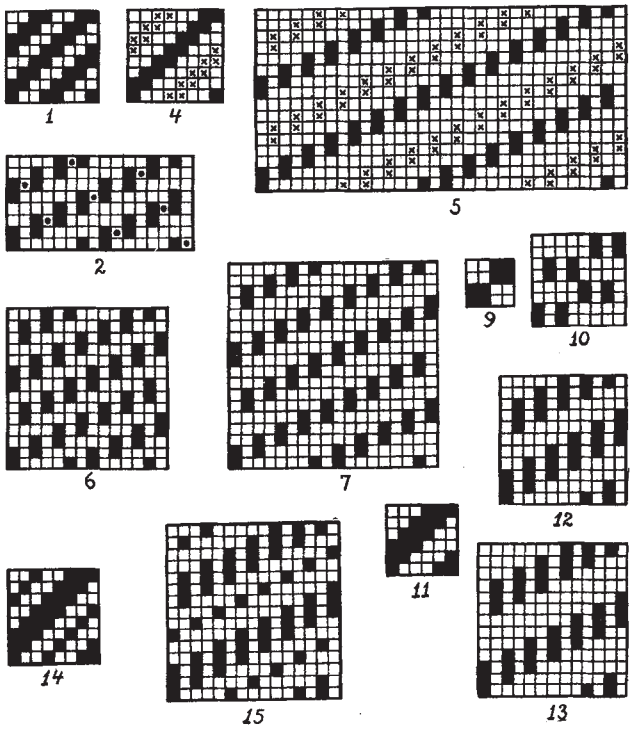
Another feature in favor of this system of weaves is, that by means of them, special effects can be produced in the fabric on account of the threads appearing and disappearing, more or less, from the face of the cloth, they for this reason furnishing means for an endless variety of novel effects.

Another item in favor of increasing the bulk of a fabric by means of its own warp is that these weaves only call for one beam work, whereas its mate system, previously referred to, (two systems of warp) calls, in most instances, for two warp beams to be used, one to carry the face warp, the other to carry the back warp.

It is true, that fabrics constructed by these weaves may somewhat change the appearance of their face, with reference to their mate single cloth weave, a feature which, however, should make no trouble to the manufacturer, for the fact that the selling samples are woven with these weaves, again this system of weaves may be the means for producing better selling styles than similar fabrics constructed with two systems of

As will be readily understood, the amount of floating for the warp on the back of the structure, in one repeat of the weave, may be varied, *i. e.* larger or shorter floats may be used, depending upon the required feel of the fabric to the touch of the hand.

We will now explain the principle of constructing these weaves by means of analyzing a collection of practical weaves.



Arrangement of Warp: 1 @ 1.

Fig. 1 shows us two repeats of the 4-harness even-sided twill.

Fig. 2 shows us this weave arranged for two systems warp and one system filling, one end face warp to alternate with one end back warp, throughout the

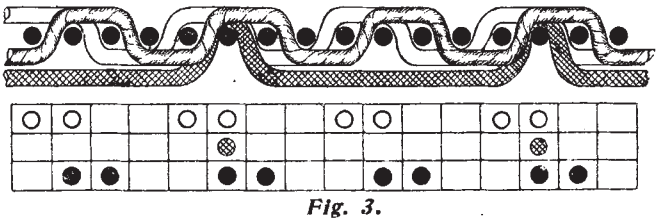


Fig. 3.

repeat of the weave, and which in turn calls for 16 warp threads and 8 picks. The face warp threads are shown by means of *full* type, that of the back warp by means of *dot* type.

Fig. 3 shows us the section of a fabric interlaced with this weave, showing the interlacing of 3 warp

one end face warp. Below the fabric section, its mate portion of the weave plan is given.

The warp thread shown in the weave in circles is shown in the section in outline; the back warp thread is shown in both, the weave plan as well as the section of the fabric cross hatched, whereas the third warp thread, as shown in the weave plan in black circles, is shown shaded in the section of the fabric.

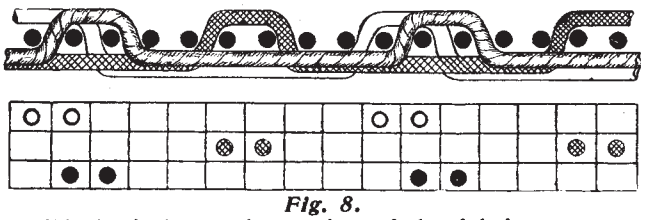


Fig. 8.

Black circles in the section of the fabric represent the filling.

It may be well to mention that to produce section, we turned sample 45 deg. *i. e.* the warp threads are shown in the section as you would ordinarily consider them to represent picks.

Fig. 4 shows us two repeats of the 4-harness even sided twill, executed in two kinds of type, one twill being shown in *black* type, the other in *cross* type.

This diagram has been given to facilitate illustrating the construction of the present system of weaves, and where, by consulting weave

Fig. 5 it will be seen that the same is constructed from weave Fig. 4, under the following conditions:

1st warp thread: take *full* squares, miss *empty* and *cross* type, of first warp thread of Fig. 4.

2nd warp thread: take *cross* type, miss *full* and *empty* squares, of first warp thread of Fig. 4.

Continuing this double drafting (constructing two warp threads for the new weave Fig. 5) from every warp thread of effect weave Fig. 4, gives us in turn the new weave Fig. 5, repeating on $(8 \times 2 =)$ 16 warp threads and 8 picks.

Examining weave Fig. 5, we will readily notice an imperfection with reference to a perfect 4-harness face effect, *i. e.* the distance between *full* to *cross* type and that of *cross* to *full* type, differs, it being in the first instance one pick, in the other instance two picks, a feature which on the face of the fabric will show up one of the filling twill lines in every two repeats of a 4-harness twill more prominently than the other since one twill line floats over a larger number of face-acting warp threads than the other.

This disadvantage, characteristic to weave Fig. 5, with reference to a pure 4-harness twill face, is readily overcome by arranging a uniform distance for the two twill effects in the repeat of the weave.

Weaves Figs. 6 and 7 explain the subject, both being perfect *False Back* weaves, as we technically call this system of weaves.

Weave Fig. 6 shows one pick skipped, between the two twills in the repeat of the weave.

Weave Fig. 7 shows two picks skipped, between the two twills in the repeat of the weave.

Weave Fig. 6 repeats on 7 warp threads and 7 picks, and refers to a tighter interlacing weave, as compared to its companion

Weave Fig. 7, and which repeats on 9 warp threads and 9 picks.

To more clearly explain the fabric structure produced, Fig. 8 has been designed. The same shows a section of a fabric interlaced with weave Fig. 7, cut in the direction of the warp. Three warp threads (see outlined, cross-hatched and shaded) and 16 picks (see black circles) are given.

Below the fabric section, the corresponding portion of the weave plan is given, and which will readily explain itself.

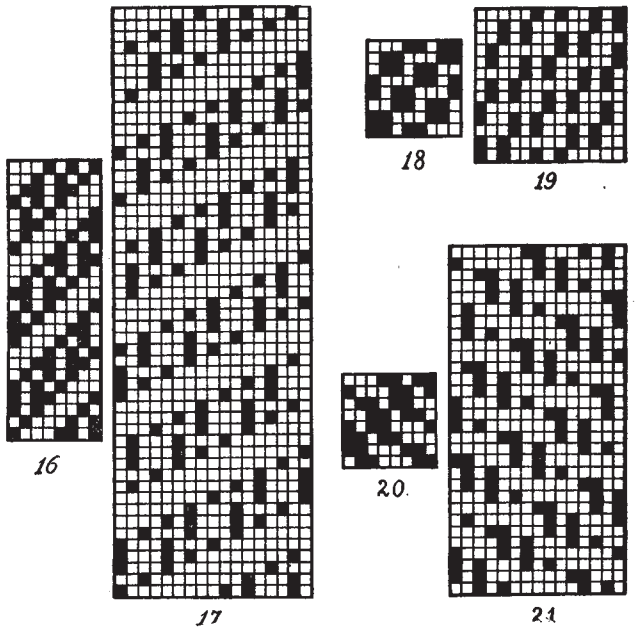
It will prove of interest to the reader to compare diagrams Figs. 3 and 8, for the fact that both are intended to produce an identical fabric structure. It must be remembered that a difference can only be distinguished by the experienced finisher or cloth examiner, on account of the characteristic smooth face of the fabric woven with weave Fig. 7, compared to such as interlaced with weave Fig. 2. The same would be the case if weave Fig. 6 was used in place of weave Fig. 7.

BASKET WEAVES.

The same are well suited for the purpose of adding a false back. One example will suffice.

Fig. 9 shows us the common 4-harness basket, one of our most frequently met with weaves.

Fig. 10 shows this weave rearranged for a false back, repeating on 8 warp threads and 8 picks. To



produce this weave proceed the same as in the previously given example: Paint two repeats high of the 4-harness basket. Draft for 1st thread of weave Fig. 10 only the risers in the lower repeat of the first warp thread in the basket weave; drafting for the 2nd thread of weave Fig. 10 only the risers in the upper repeat of the first warp thread in the basket weave. Continue in this manner of drafting two warp threads from each warp thread of the two repeats high 4-harness basket weave until repeat of the false back weave is obtained.

THE $\frac{3}{3}$ 6-HARNESS TWILL

is shown in Fig. 11, and its arrangement for false

back in weaves Figs. 12 and 13.

Weave Fig. 12 repeats on 11 warp threads and 11 picks, and refers to a closer interlacing fabric structure, as compared to one produced with

Weave Fig. 13, and which repeats on 13 warp threads and 13 picks.

FANCY TWILLS.

One example, showing how to arrange these weaves for false back structures, is given in connection with weaves Figs. 14 and 15.

Weave Fig. 14 shows us the $\frac{3}{2}\frac{1}{3}$ 8-harness twill-single cloth structure, and

Fig. 15 its arrangement for a false back structure, repeating on 15 warp threads and 15 picks.

Consulting the latter weave plan more closely, will clearly show its construction *viz:* drafting one repeat of the foundation twill on every other warp thread of the new weave plan, inserting a second repeat of the foundation twill on every thread not drafted for in the weave, being careful to keep the two twills equally distant apart. The latter item, in connection with our weave, means one pick, and which will result in a most perfect fabric structure; again; if so desired, two picks may be missed between the two twills in one repeat of the false back weave, producing in turn a somewhat looser interlacing of warp and filling as compared to that of weave Fig. 15.

FIGURED TWILLS.

Arranging these weaves for false backs is shown by weaves Figs. 16 and 17.

Weave Fig. 16 shows a neat, figured granite effect twill, repeating on 8 warp threads and 24 picks.

Fig. 17 shows this weave arranged for a false back; repeat 17 warp threads and 51 picks.

GRANITE WEAVES.

Two examples explaining the application of these weaves for false back structures are given, using two of our most popular granite weaves for this purpose.

Fig. 18 is a granite weave repeating on 8 warp threads and 8 picks.

Fig. 19 is its false back; repeat 13 warp threads and 13 picks.

Fig. 20 is again a granite weave, repeating on 8 warp threads and 8 picks.

Fig. 21 is its false back; repeat 15 warp threads and 15 picks.

Arrangement of Warp: 2 @ 1.

Provided a fuller face in the fabric is desired, single cloth weaves may be arranged for false back in an average proportion of 2 face @ 1 back.

To illustrate subject, weaves Figs. 22-34 are given, presenting in several instances weaves treated before as 1 @ 1, hence will explain most readily how to produce a false back by the new combination of face and back.

Fig. 22 is our 4-harness even sided twill.

Fig. 23 shows this weave arranged for false back; repeat 13 warp threads and 13 picks. Should it be found that this weave produces a fabric too hard to the touch of the hand, the arrangement given in connection with weave Fig. 24 will overcome this trouble, although the latter weave has an inclination to show one of the filling effect twill lines more prominently compared to the other *i. e.* resembling somewhat an 8-harness repeat for the face in place of 4. Repeat of weave 25 by 25.

Fig. 25 is the $\frac{3}{2}\frac{1}{2}$ 8-harness twill (see Fig. 14) and

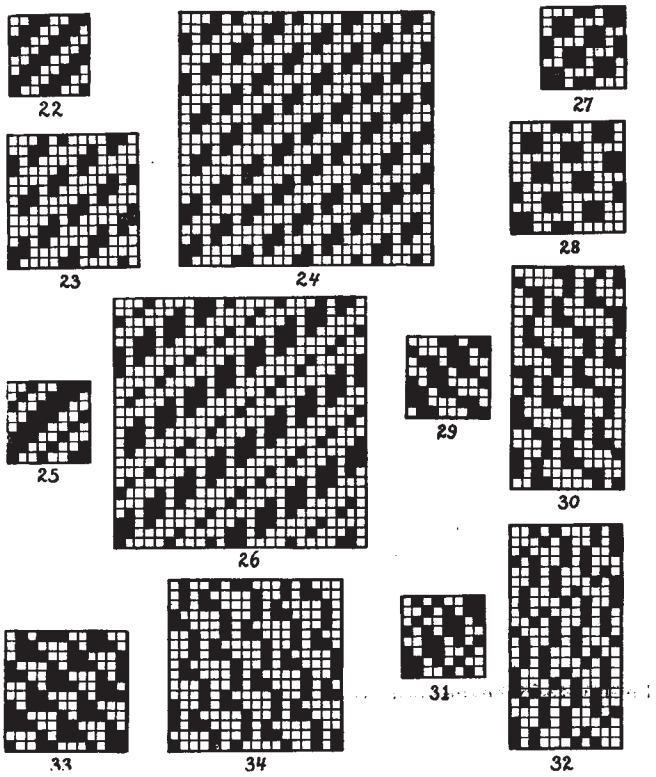


Fig. 26 its arrangement for false back 2 @ 1; repeat 25 by 25.

Fig. 27 is an 8-harness granite (see Fig. 18) and

Fig. 28 its arrangement for false back 2 @ 1; repeat 11 by 11.

Fig. 29 is an 8-harness granite (see Fig. 20) and

Fig. 30 its arrangement for false back 2 @ 1; repeat 11 by 22.

Fig. 31 is an 8-harness granite and

Fig. 32 its arrangement for false back 2 @ 1; repeat 11 by 22.

Fig. 33 is a 12-harness granite and

Fig. 34 its arrangement for false back 2 @ 1; repeat 17 by 17.

RIBBONS, TRIMMINGS, EDGINGS, ETC.
Producing Figures in Smooth Ribbons.

(Continued from page 143.)

Fig. 171 is a sketch for a ribbon, to be produced with one system warp (ground warp) and three systems filling; one system for the ground and two systems for the figure.

Fig. 172 is the corresponding point paper design.

In the loom (weaving ribbon face down) place your ground pick in the lower box, placing in the middle box the filling which has to produce the widest weaving portions of the figure, and in the top box the filling producing the more innermost working portions of the figure. Provided we would reverse position of these two figure picks, the ends would catch with each other, resulting not only in waste (looping around