WELTS, PIQUES, TOILET CLOTH, QUILTINGS, BED SPREADS

The same refers to Figured Cotton Fabrics in which the design is produced by depressed effects, imparting in turn to the portion of the fabric between said depressions a raised appearance.

To explain this effect in the most simple manner, consider two pieces of plain single cloth fabrics placed above each other and stitched together on a sewing machine in a straight line; duplicate this line parallel to the first line, say for example ¼ inch apart, after which produce two correspondingly stitched lines at a right angle (90°) to the first two lines, and when these four stitched lines will show depressions in the shape of a small check, since the two fabrics are there united into one structure, whereas the square itself, and where the two single cloth structures rest independently one above the other, will present a somewhat raised effect. In a somewhat similar manner this effect is produced on the loom in the construction of the fabrics, using in connection with a single cloth fabric, an extra system of warp or filling, or a complete additional ply structure. This additionally used system of threads or the ply complete, as the case may be, is in turn, at the places where the depression is to show on the face of the fabric, stitched to the face structure.

Besides this characteristic system of weaves thus referred to, we find in practical work imitations of these weaves and which we will first briefly explain. They refer to pure single cloth weaves, i. e., fabrics, and can be subdivided again into (a) Pure Imitation Effects, (b) Combination Imitation Effects, and (c) Figured Effects.

(a) Pure Imitation Effects.

In connection with these weaves the filling as a rule forms the face, i. e., pattern of the fabric, hence a lower count of yarn compared to that of the warp is used for the former. Squares, standing on one of their points (Diamond patterns) are figures frequently used, referring to a class of weaves also known as pointed twills; in connection with these weaves prominent filling effects are used.

Weaves Figs. 1, 2, 3 and 4 give us four examples of this class of weaves, repeating respectively on 8, 8, 32 and 18 warp-threads and picks.

Weaves Figs. 5 and 6 belong to the same class of weaves, but are of a different construction. Fig. 5 shows two entwining rectangles produced by the plain weave, repeat 8 by 8; and Fig. 6 a *plain* set check, filled alternately with warp and filling effect basket; repeat 12 by 12.

(b) Combination Imitation Effects.

An endless number of weaves can be constructed under this subdivision. Two examples are given viz:

Weave Fig. 7 shows a stripe effect produced with the 5-harness satin warp effect to alternate with pointed twill filling effect, i. e., filling effect squares placed on their point; repeat of weave 25 by 10.

Weave Fig. 8 shows a checkerboard stripe having the 4-harness broken twill warp and filling effect for its foundation exchange alternately with a stripe interlacing with a pointed twill, filling effect. Repeat of weaves 44 by 16.
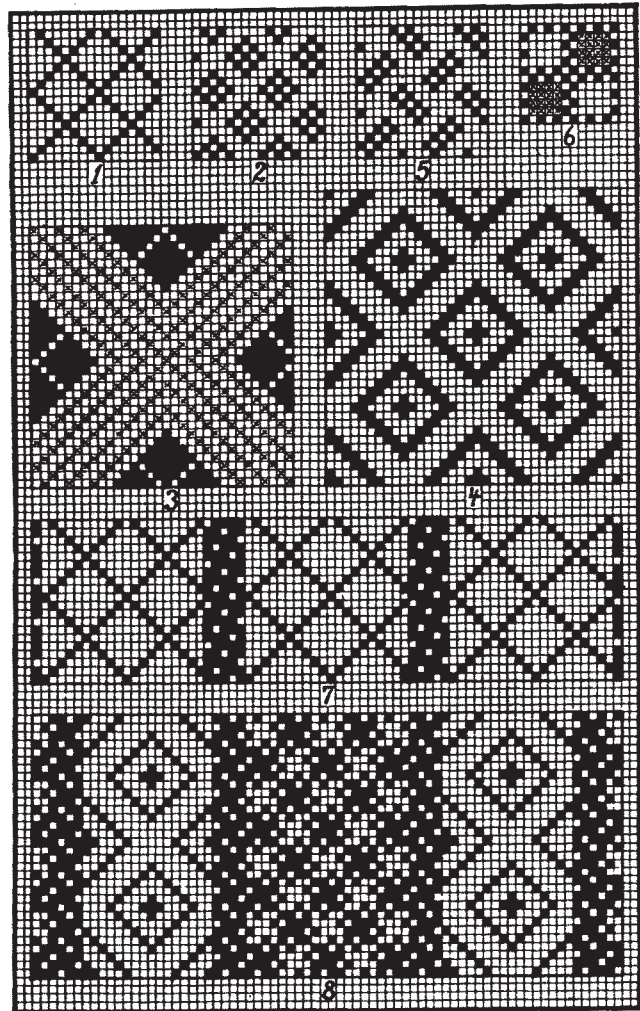
(c) Figured Effects.

Weave Fig. 9 is given to illustrate the subject. In its basis of construction the same is closely related to weave Fig. 6, the difference being, that in connection with the latter weave, we used warp and filling effect of basket weave to alternate after the *plain* setting, whereas in the present example of a weave (Fig. 9) we used a *fancy* motive for setting, i. e., for distributing the warp and filling effect basket.

The motive selected is shown in diagram Fig. 10, being a repeat and a half of the pattern given in order to more clearly show the design.

Fig. 11 shows one repeat 6 by 6, filling effect basket, as is used for every *empty* square in motive Fig. 10.

Fig. 12 shows one repeat 6 by 6, warp effect basket, as is used for every square in motive Fig. 10 indicated by *cross* type.

Repeat of weave Fig. 9 is 48 warp-threads and 48 picks, which by means of a fancy draw can be reduced to 10 harness.

Weave Fig. 13 shows another example of such a figured effect weave produced by the exchange of warp and filling floating after a given motive. Repeat of weaves 32 warp-threads and 32 picks, which by means of a fancy draw can be reduced to 6-harness.
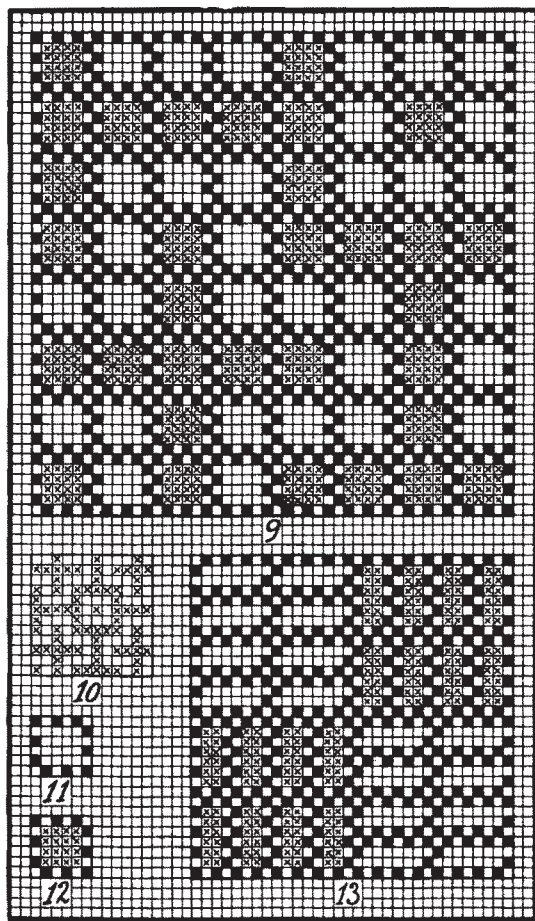
In connection with fabrics constructed with weaves Figs. 9 and 13 use a heavier count of yarn for warp-threads and picks which float, as compared to those threads which interlace with the plain weave.

WELTS, OR CORDS.

Under this class of fabrics we classify piqué structures showing depressed (sunken) lines, *i. e.,* indentations running widthways, *i. e.,* in the direction of the filling in the fabric, as seen from Fig. 14, representing a photographic reproduction (actual size) of such a welt structure, the same to be later on referred to in detail.

Welts are produced with two systems of warp, and one or two systems of filling. With reference to the warp the same refers in all instances to a face and a binder, figure or back warp. With reference to the filling, in connection with light textures only one system (face) is used, whereas bulk of the fabric is obtained by means of stuffer or wadding picks. The indentations *i. e.,* lines in the fabric are produced by

allowing the back warp-threads (**binder** or figure threads, as variously called) to be lifted for one, two or three picks in succession into the face cloth, this stitching being done in rotation at the same pick or picks all over the width of the fabric in the loom, and this with every back warp-thread used, in that way producing the characteristic cut line across the width of the fabric. The same procedure is repeated after a certain number of regular plain weaving face picks, interlacing with the face warp only, have been inserted. Two beams are used for carrying the warp, one beam carrying the face warp and which is kept at a moderate tension, the back warp coming from the second beam and which is very heavily weighed to thus assist in producing pronounced indentations to the face of the cloth at the places where said back warp stitches to the filling. As mentioned before, in order to increase the bulk of the fabric, in most cases we find wadding or stuffer picks added. This refers to a heavier count of yarn as compared to that of the face filling; at the same time only a slight twist is imparted to this wadding filling since the object of its use is to produce bulk and warmth to the fabric and not wear. At the same time, by its bulk and loose twist, these wadding picks assist in making the indentations as produced by the back warp more pronounced, by somewhat raising the ridge of the fabric containing the 4, 6 or more plain interlacing face picks, *i. e.,* impart to the design of the fabric (more particularly when later on dealing with piqué weaves) an embossed appearance.

The proportion of face and back warp in most all instances is 2 ends face to alternate with 1 end back, *i. e.,* 3 ends in repeat of pattern. The reeding of the warp is done with 3 ends per dent, thus:

1 end face
1 " back
1 " face

—

3 ends per dent, *i. e.,* every back warp-thread having a face-warp-thread on either side in one dent.

The number of face picks in the width of one cord varies to suit texture of the fabric, counts of yarn used, as well as the demands of the market, but even with high textures does not exceed twelve picks, six, eight and ten picks being those most extensively met with.

Diagrams and weaves Figs. 15 to 42 inclusive are given to explain the construction of welts, giving at the same time a collection of the most often met with weaves of this class.

Diagram Figs. 15, 21, 27 and 33 show the planning of these weaves, referring in each instance to the arrangement of:

1 end face warp
1 " back "
1 " face "

—

3 ends in repeat.

With reference to weaves filling ways, four different lines of combinations are given, *viz:* 6-8; 8-10; 10-14; 12, 6-16, 8.

Welts for 6 and 8 Picks.

Fig. 15: Diagram showing by means of a *cross* type, interlacing of face warp only.

Fig. 16: Single welt, 3 by 6; the interlacing of the back warp is shown by *full* type.

Fig. 17: The previously given weave, showing 2 wadding picks (see *dot* type) added to each repeat of the weave thus:

Fig. 14

1 pick face
1 pick wadding
2 picks face
1 pick wadding
3 picks face
———
8 picks in repeat.

Connecting lines between Fig. 16 and Fig. 17 show where the wadding pick in Fig. 17 enters in the weave of the single welt Fig. 16.

This arrangement refers to looms with two boxes on each side. Since there are fancy looms built with boxes on one side only having one box on the other, weave Fig. 18 is given, showing the arrangement of the weave previously given for this class of looms, *i. e.*, two wadding picks (see *dot* type) are introduced next to each other, *i. e.*, in rotation. This will bring the second shuttle always back to the box side of the loom, previously to inserting the six face picks in rotation.

In weave Figs. 17 and 18 the back warp after stitching into the two picks of face filling, then floats on the back of the fabric structure for six picks. In some instances this floating of the back warp is done away with, the latter being stitched once in the repeat of the weave to one of the wadding picks.

Weave Figs. 19 and 20 explain this procedure by means of *shaded* type, Fig. 19 being the mate to Fig. 17, and Fig. 20 to that of Fig. 18.

Welts for 8 and 10 Picks.
Fig. 21: Diagram showing face weave only.
Fig. 22: Single welt 3 by 8.
Fig. 23: Adding two wadding picks distributed (see *dot* type) to above single welt, repeat 3 by 10.

This is the weave used in the construction of fabric shown in diagram Fig. 14 with the following details as to texture, counts of yarns and general lay out.

FABRIC CALCULATION.
Finished width of fabric: 40 inches.
Warp: 2 ends Face, 36's cotton
　　　　1 end　Back, 32's cotton
　　　　———
　　　3 ends in repeat of pattern.

2606 ends Face + 24 Selvage = 2630 ends
1303　" 　 Back + 12　　 "　 = 1315　"
————　　　　　　　　　　　 ————
3909　　　　　　　　　　　　 3945.

Calculating on the basis of $39\frac{1}{2}$ inches width of actual fabric and allowing $\frac{1}{2}$ inch for the two selvages of the fabric in order to get the 40 inches finished width of the fabric, compels us to add about 10% to the width of the fabric in the reed to obtain width required finished, hence $39\frac{1}{2}$ + 10% = 43.5 or we must lay the fabric *at least* $43\frac{1}{2}$ inches wide in the reed to obtain its required finished width.

Reed: 30 with 3 ends per dent = 90 ends per inch, and 3945 ÷ 90 = 43.8. This will be the reed to use, allowing a very slight shrinkage above the 10% previously mentioned to the fabric.

Take-up of the face warp at weaving about 28 per cent.

Take-up of back warp at weaving about 3 per cent.

Filling: 120 picks per inch, 20's cotton, with its twist in the same direction as is given the warp, *i. e.*, twisted warp ways.

CALCULATING AMOUNT OF MATERIAL REQUIRED.
Ascertain amount of yarn required for 100 pieces, each 90 yards long from loom, *i. e.*, before bleaching, allowing besides figures previously given 2 per cent

for waste in warp at beaming and waving and 4 per cent for waste of filling on the looms, we find:

$$\text{Face warp:} \ \frac{2630 \times 100 \times 90 \times 128 \times 100}{840 \times 36 \times 100 \times 98} = 1022 \text{ lbs}$$

$$\text{Back warp:} \ \frac{1315 \times 100 \times 90 \times 103 \times 100}{840 \times 32 \times 100 \times 98} = 463 \text{ lbs}$$

$$\text{Filling:} \ \frac{43.8 \times 120 \times 100 \times 90 \times 100}{840 \times 20 \times 96} = 2933 \text{ lbs}$$

Amount of material required......... = 4418 lbs

Fig.33   Fig.34   Fig.35   Fig.36
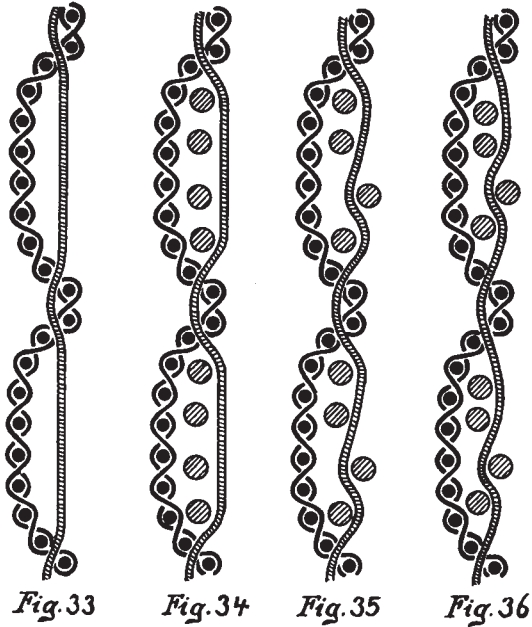
Fig. 24 shows us the same welt weave as given in the previous example arranged for looms with one box on one side; repeat 3 by 10.

Fig. 25 is the mate weave to Fig. 23 showing in this instance the back warp (see *shaded* type) stitched to the wadding pick once in one repeat of the weave. In the same manner weave Fig. 26 is related to weave Fig. 24 previously explained.

Diagram Fig. 27 and weaves Fig. 28 to and inclusive 32 show the welt weave, with 10 picks to the round for its face, adding in this instance 4 wadding picks to the repeat in connection with the last four examples of weaves. Type for indicating the different kinds of warp and filling used is the same as in the previously given examples, hence no special reference necessary.

In order to clearly illustrate the method of interlacing of these welt weaves to the reader, diagrams of fabric sections produced with weaves previously illustrated and explained are given, and of which:

Diagram Fig. 33 shows in section a fabric interlaced with weave Fig. 28.

In the same manner:

Diagram Fig. 34 refers to weave Fig. 29
    "   "   35   "   "   "   "   31
    "   "   36   "   "   "   "   32

Notice the difference in the position of the wadding picks between diagrams Fig. 35 and 36; although the same interlacing, they are more evenly distributed in the first one.

Every diagram is shown considering the fabric cut in the direction of the warp in order to show up the indented and the raised effects as are produced in the fabric by the nature of the weave and by the method of mounting (let-off) of the loom. Two repeats of the filling pattern are given in each diagram.

Full lines indicate face warp
Shaded   "   "   back   "
Full circles   "   face filling
Shaded   "   "   wadding picks.

Fancy Welts.

This consists in imparting to the fabric rib or cord effects of two sizes, *i. e.*, wide effect lines to alternate with narrow effect lines.

Diagram Fig. 33 and weaves Figs. 34 to and inclusive 38 are given to illustrate the subject.

Two size rib effects are shown, one covering 10 picks distance between interlacing of back warp with its face filling, the other only four picks.

Weave Fig. 38 is the welt weave showing the back warp floating while not stitching; repeat of weave 3 by 18.

Weave Fig. 39 shows single wadding picks added *viz:* 4 for the large rib and 2 for the small rib; repeat of weave 3 by (18 + 4 + 2 =) 24. ·

Weave Fig. 40 has the same proportions of wadding picks used as the previously given example, but the wadding picks are in this instance introduced in pairs to suit looms with a single box on one side. Repeat of weave 3 by 24.

Weave Fig. 41 is the mate weave to weave Fig. 39, the only difference being that in this instance the back warp while floating below the 10 face picks is once (in one repeat of the weave) stitched to one of the wadding picks (see *shaded* type). Repeat of weave 3 by 24.

In the same way weave Fig. 42 treats weave Fig. 40.

(*To be continued.*)

CONSTRUCTION OF SKIP TWILLS.

(b) Check Effects.

In this instance there are break effect lines formed on the face of the fabric in both directions (warp and filling ways) in turn producing the required check effect.

For this reason the procedure previously explained in connection with the warp-threads and which is now also observed, must be extended to the filling, *i. e.*, after drafting a certain number of picks of our foundation twill in rotation for one group, we then must skip the proper number of picks of the foundation twill (half of the repeat minus one) in order to produce the break lines running filling ways, in addition to those running warp-ways in the fabric, so as to form the check effect.

Weaves Figs. 12 to 16 are given to illustrate the subject.

Fig. 12 has for its foundation the 4-harness even-sided twill, using four warp-threads and four picks for the unit of one group.

The drafting of this weave from its foundation twill then will be: Take warp-threads and picks 1, 2, 3 and 4, skip warp-thread and pick 1; draft warp-threads and picks 2, 3, 4 and 1, skip warp-thread and pick 2;