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DESIGNING AND FABRIC STRUCTURE.

MANUFACTURE OF DRESS GOODS.

Figured Dress Goods.

(Cotton Warp—Silk Filling, 27 inches wide.)

Fig. 1. Actual reproduction of fabric.

Fig. 2. Complete Weave; Repeat: 96 warp-threads and 68 picks.

Fig. 3. Drawing-in draft; 16-harness.

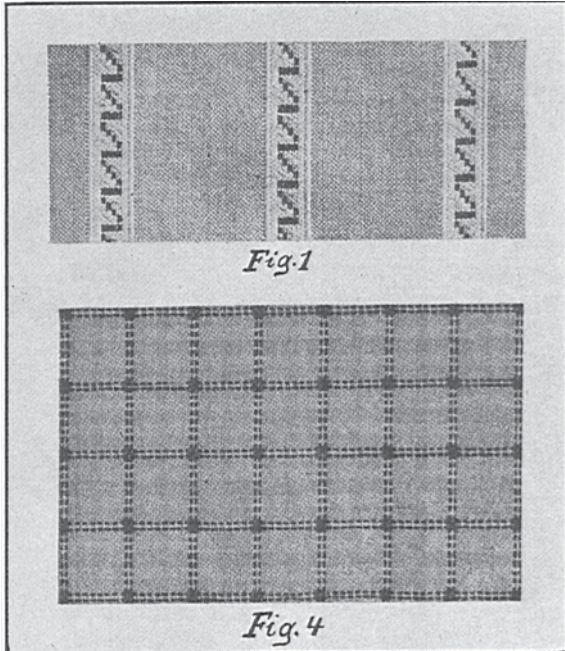


Fig. 1

Fig. 4

Warp: 2784 ends (29 repeats of pattern).

Dress: 28 ends color #1 (light)
 13 " white
 1 end color #2 (dark) } times 8
 1 " white
 11 ends white
 28 ends color #1 (light)

96 ends repeat of pattern.

Above the weave the dressing of the warp is indicated by:

Dot type for color #1, or ground warp,

Empty type for white warp,

Full type for color #2, or figure warp, and which refers to an extra system of warp, producing the figure effect by being raised wherever required by the design on the face of the fabric, floating otherwise on back of cloth.

For color #1 use any fashionable light to medium shade.

For color #2 use black, dark blue, dark brown, etc., to harmonize with color #1.

Filling: 88 picks per inch; white spun silk.

The floating of the filling (silk) in the stripe is

arranged to impart brightness to the latter, without interfering with the dull, dark figure as produced by the extra warp-threads.

Fancy Gingham. (27 inches wide.)

Fig. 4. Actual reproduction of fabric.

Fig. 5, Weave; Repeat 36 warp-threads and 38 picks, 2 repeats each way of weave are given.

Fig. 6, Drawing-in draft; 8-harness.

Warp: 2916 ends (81 repeats of pattern)

Dress: 16 ends light
 2 " dark
 2 " light
 2 " dark
 14 " light

36 ends, repeat of pattern.

Above the weave, the dressing of the warp is indicated by:

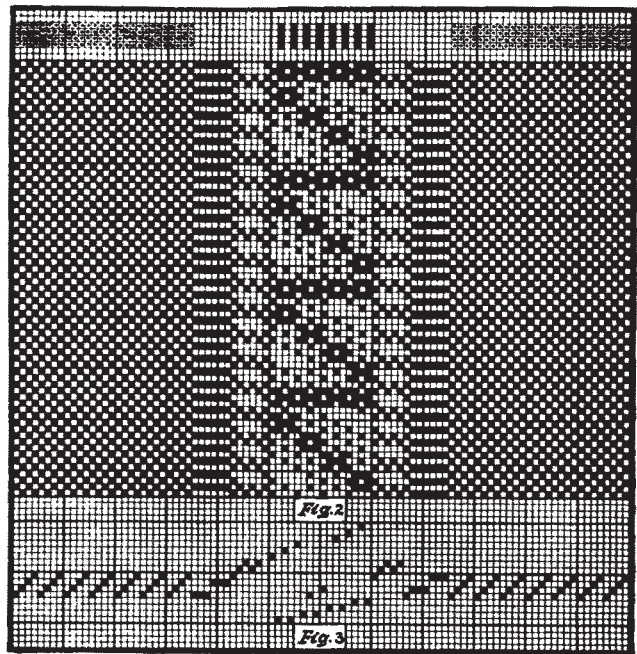
Dot type for light.

Full type for dark.

Filling: 102 picks per inch arranged thus:

17 picks light
 2 " dark
 2 " light
 2 " dark
 15 " light

38 picks, repeat of pattern.

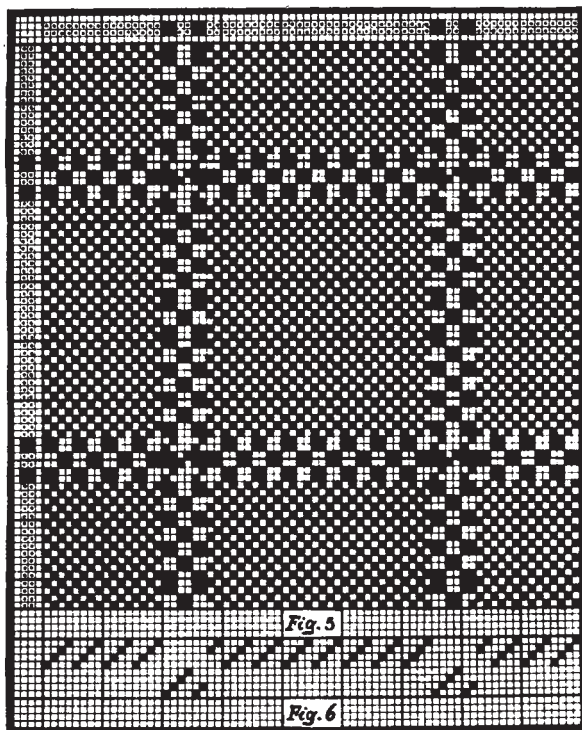


At the left of weave, the arrangement, *i. e.*, placing of the filling, is indicated by:

Dot type for light

Full type for dark.

A prominent feature of the weave and its color effect is the black spot formed where the three rows of warp and filling basket weave meet. The color arrangement for these six warp-threads and six picks of basket weave is 2 dark 2 light 2 dark. The dark



threads of both systems of threads, where meeting with each other, divide from working alike in pairs (for basket weave) into plain weaving; the same is the case with the two light threads of warp and filling. The latter, *i. e.*, the meeting of the two light warp-threads and two light picks, interlaced with the plain weave, does not show on the face of the fabric on account of the closeness of the interlacing, being covered by the floats of 3-up of the dark color on all four sides of said 2 warp-threads and 2 picks plain weave; hence the solid dark spot, previously referred to, is met with in the fabric.

RIB WEAVES, CONSTRUCTED WITH BACKING OR RIB PICKS.

The object of this system of weaves is to produce prominently raised ribs in the fabric structure. Most often, the lines of the ribs are made to run lengthwise (in direction of the warp) in the fabric; however, in some instances they are made to run in an oblique direction, or produce figured effects.

The characteristic feature of these weaves is the rib pick effect, *i. e.*, every pick in the repeat of the weave floating for a certain number of warp-threads on the back of the fabric structure, floating over, or more often interlacing with the balance of the warp-threads in the repeat of the weave. The points of the rib stitches, *i. e.*, the beginning and ending of the rib float on the back of the structure indicates the width of the rib effect on the face of the fabric, and the dis-

tribution of these stitches in turn produces the design, *i. e.*, the rib line, and which, as mentioned before, is made to run either lengthwise or in an oblique direction in the fabric; in some few instances special figure effects are produced.

The object of the rib pick is to permit a more or less contracting of that portion of the fabric on its back, with its consequent raising of the interlaced portion of the fabric structure, and which has a tendency to spread out, hence raise, in turn imparting to the face of the fabric the characteristic raised (embossed like) rib effect. More so will this be the case in connection with worsted dress goods and men's wear, and where during scouring and its consequent fulling effect, the rib pick will contract more readily and in turn raise the interlaced rib portion of the fabric so much more.

The weaves used for interlacing the rib, *i. e.*, face structure, are always simple weaves, the ones most frequently used and in turn producing the most serviceable results are the plain weave and the 3-harness (warp effect) twill; other weaves used are the 4-harness twills (the even sided, and the warp effect) the 4-harness basket and some fancy 45 deg. twills.

The size of the floating of the rib pick varies, from below 4 to 12 warp-threads, or in connection with high warp textures up to below 18 warp-threads, without stitching; larger floating rib picks require stitching.

Ground Pick to Alternate with Rib Pick.

Weaves Figs. 1, 2 and 3 illustrate the subject.

Weave Fig. 1, repeat 12 x 4. Ground weave used is the plain weave, see *full* and *cross* type. Size of rib: 8 to alternate with 4. Rib pick: Below 8 and above 4 warp-threads, see *dot* type. The first 8 warp-threads, interlacing with the filling (*full* and *dot* type) will produce the characteristic, raised rib effect in the fabric. Warp-threads 9 to 12 will, with the filling (*cross* type) produce a plain, filling face, rib cord. It will thus be seen that for the first 8 threads, the weave forms a warp effect (warp forms the face) and for the next 4 threads a filling effect (filling forms the face) in the fabric.

Weave Fig. 2, repeat 12 x 8. Ground weave used is the 4-harness (warp effect) twill. The various types for this weave are selected to correspond with those of the previously explained weave, thus explanations given then refer also to the present example of a weave, the only difference being the change in the ground weave used.

Weave Fig. 3, repeat 15 x 4. Ground weave used is the plain weave. Crochet type for indicating the construction of the weave is again selected to correspond to such as used with weave Fig. 1, hence no special reference to construction of weave Fig. 3 is necessary. No interlacing of warp-threads 1, 2 and 3 with its rib pick takes place; these warp-threads interlace with the filling on the principle of a common filling effect rib weave, and in which instance this weave differs with the construction of weaves Figs. 1 and 2 previously explained.

Fig. 4 is a diagram representing a section (cut fill-

ing ways) of a fabric interlaced with weave Fig. 3. Two picks (*A, B*) and one repeat of the warp-threads (numbered 1 to 15) are shown; one additional warp-thread to the left and four more at the right (more than one repeat) are given to make the illustration more clear to reader.

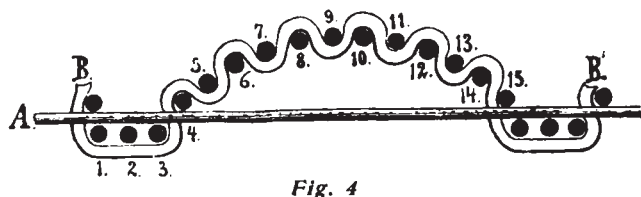


Fig. 4

Pick *A* in section Fig. 4 is the second pick (from the bottom) of weave Fig. 3; pick *B* in section Fig. 4 is the third pick (from the bottom) of weave Fig. 3. Diagram Fig. 4 is drawn exaggerated as compared to the woven fabric structure, in order to explain the formation of the raised rib effect (more clearly) to the reader, showing that where pick *B* interlaces with the warp-threads (4 to 15) the characteristic embossed or raised tendency for the fabric structure takes place on account of the interlacing of the threads, *i. e.*, nearly the double number of diameters of threads in a given space as compared to where pick *B* floats on back of warp-threads 1, 2 and 3, as a rib pick.

In connection with weave Fig. 3, as well as similar weaves constructed by this method of designing rib weaves, it will be advisable to use two warp beams, one to carry warp-threads 1, 2, 3 and its mate threads in the successive repeats in the complete warp, the other beam to carry warp-threads 4 to 15 and its mate threads in the complete warp. This will be necessary, for the fact that threads 1, 2 and 3 only act in the present weave, as a guide for placing the filling alternately on top or bottom of said three warp-threads, hence no take-up in weaving, in fact these warp-threads in some fabric structures may stretch in length. Warp-threads 4 to 15 interlace $\frac{3}{7}$ with the filling, hence a take-up of the warp in weaving will take place. More particularly will this difference in the take-up of these two systems of warp-thread be noticed if matter refers to men's wear worsteds, *i. e.*, a high warp and filling texture.

Using Every Pick Partways for Rib Pick, Partways for Ground Pick.

(*A*) UNIFORM SIZE OF RIBS.

Weave Fig. 5 and its section Fig. 6 are given to more clearly explain the subject, the remaining weaves



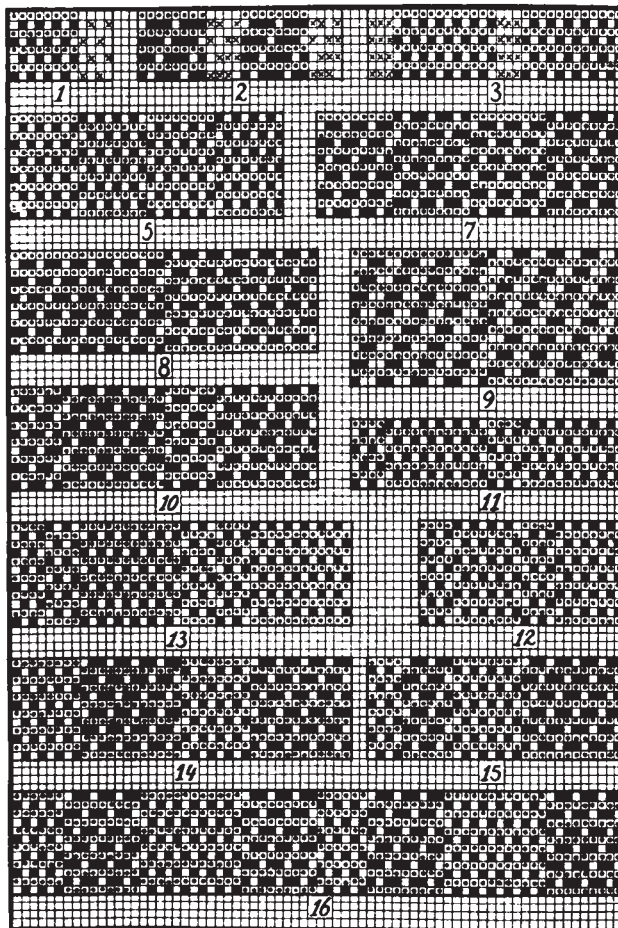
Fig. 6

of this article being based upon this principle of construction.

Weave Fig. 5, repeat 16 x 4. Ground weave used is the plain weave, see *full* type. Size of rib effects 8, with two effects to the repeat of the weave. Every pick is for 8 warp-threads (see *dot* type) floating on

back of structure (rib pick) and for 8 warp-threads (see *full* type) interlacing with the warp on plain weaves. Actually considered, on account of the plain weave joining the float on one side, previously given figures revolve itself down to "9 floating 7 interlacing." This feature will occur so much more prominently with other weaves than the plain weave, but no reference will be made; it can not be overcome.

Fig. 6 is a diagrammatical section of a fabric interlaced with weave Fig. 5, the section being taken through the warp-threads, *i. e.*, the sample fabric structure represented cut in the direction of the filling. Two picks are shown in the diagram *viz.*:



Pick *A* showing the interlacing of Pick 1 (bottom pick) of weave Fig. 5.

Pick *B* showing the interlacing of Pick 2 of weave Fig. 5.

Examining diagram Fig. 6 (and which is drawn again exaggerated compared to the actual fabric structure, in order to simplify explanation to the reader) clearly shows the formation of the embossed rib effects in the fabric, using for this purpose every pick alternately for rib pick (floating) and for interlacing with the warp. Points previously referred to regarding contraction of the rib effect portions of the pick and expansion of the interlacing portions of the pick hold good in this weave and in fact for every rib weave of this system; it increases the desired raised, embossed effect of the individual ribs in the fabric.

Explanations given in connection with weave Fig. 5 refer also to weaves Figs. 7 to and inclusive Fig. 16, crochet type used in illustrating weaves has been selected to correspond, hence no detail explanation necessary.

Weave Fig. 7, repeat 18 x 6. Ground weave (see full type) the 3-harness (warp effect) twill. Size of ribs: 9 x 9.

Weave Fig. 8, repeat 36 x 6. Ground weave same as before. Size of ribs: 18 x 18.

Weave Fig. 9, repeat 32 x 8. Ground weave: 4-harness even sided twill. Size of ribs: 16 x 16.

These four examples of rib weaves, presenting uniform size of ribs in connection with using our foundation weaves for interlacing the raised rib, will indicate that any size of rib may be used in designing new weaves without departing the least from the principle of their construction laid down in our explanations.

(B) VARYING THE SIZE OF THE RIB FLOAT IN THE REPEAT OF THE WEAVE.

Weaves Figs. 10, 11, 12 and 13 are given to illustrate the subject.

Weave Fig. 10, repeat 18 x 6. Ground weave: 3-harness, warp effect, twill. Size of ribs: 6 x 12.

Weave Fig. 11, repeat 16 x 4. Ground weave: plain weave. Size of ribs: 4 x 12.

Weave Fig. 12, repeat 12 x 4. Ground weave: plain weave. Size of ribs: 4 x 8.

Weave Fig. 13, repeat 40 x 4. Ground weave: plain weave. Size of ribs: 4 x 4 x 12 x 4 x 4 x 12.

(C) USING TWO GROUND WEAVES.

This subject is explained by means of weaves Figs. 14, 15 and 16.

Weave Fig. 14, repeat 20 x 12. Ground weaves used: the plain weave and the 3-harness, warp effect, twill. Size of ribs: 8 ends plain x 12 ends twill.

Weave Fig. 15, repeat 30 x 12. Ground weaves used: the plain weave and the 3-harness, warp effect, twill. Size of ribs: 4 ends plain, 6 ends twill, 8 ends plain, 12 ends twill.

Weave Fig. 16, repeat 36 x 12. Ground weaves used: the plain weave and the 3-harness, warp effect, twill. Size of ribs: 6 ends plain, 9 ends twill, 12 ends plain, 9 ends twill.

(To be continued.)

GAUZE OR LENO WEAVING.

(Continued from page 60.)

Jacquard Gauze.

In gauze fabrics constructed upon the Jacquard loom, in which it is desired to produce large and elaborate designs by the aid of figuring with gauze and ordinary weaving, it will be necessary to arrange a slackener for every whip-thread.

We will now explain the method of adjustment and operations of slackeners for Jacquard fabrics composed of threads working in pairs (one whip-thread douping with one standard-thread). In such fabrics every whip-thread must be threaded three times; first in a heddle in rear of the regular harness, technically

known as the rear-heddle or rear-harness, next in a heddle of the ground harness and finally to the doup. The rear heddles, i. e., slackeners, have eyes 1 1/4 inches

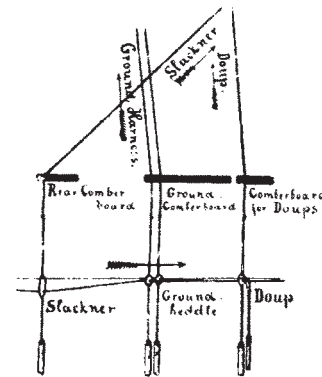


Fig. 35

high and are fastened from 1 1/4 to 1 1/2 inches lower than the heddles of the ground-harness and the doup. This rear-harness is generally placed at a distance of 8 to 10 inches from the ground-harness. The harness cord of each rear-heddle is connected with the harness cord of its mate full-heddle of the doup, to one neck-cord of the Jacquard machine (thus both harness-cords are operated by one hook) and consequently the rear-heddle will lift at the same time when raising its mate standard. This arrangement will permit the whip-thread becoming slackened from the rear when required to twist around the standard-thread when douping.

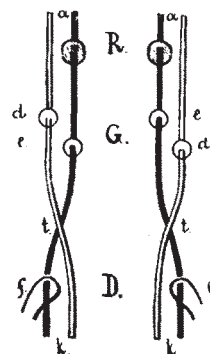


Fig. 36 Fig. 37

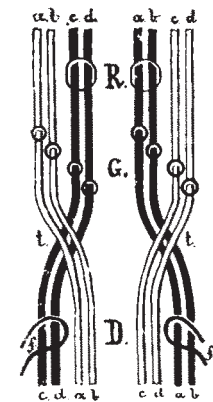


Fig. 40 Fig. 41



Fig. 38 Fig. 39

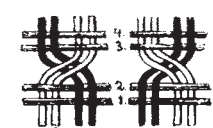


Fig. 42 Fig. 43

After the whip-thread is drawn in the rear-heddle, it is next drawn in its respective heddle of the ground-harness, from where it is threaded to the doup.

In diagram Fig. 35 a plan of the procedure thus explained is given.

In diagrams Figs. 36 and 37 are shown the ground plans of threading the previously explained Jacquard gauze. Fig. 36 represents the threading of the whip-thread in a left-hand doup.