

Fig. 47 shows the 9-harness corkscrew and

Fig. 48 its arrangement for back picks. Repeat 9 by 27.

Hitching the back picks as shown in Figs. 46 and 48 is the only way to get a perfect face, *i. e.*, perfect fabric structure in connection with these corkscrew weaves.

#### BROKEN TWILLS.

Fig. 49 shows the single cloth weave of such a twill, 8 ends twill in one direction to alternate with 8 ends twill in the reverse direction, both warp and filling ways. Repeat of weaves 16 by 16.

Fig. 50 shows its arrangement for back picks, using every other warp-thread only for hitching the backing to the face *i. e.*, single cloth structure. This as explained in connection with weaves Figs. 36 and 37 is the only way the 4-harness twill can be handled for adding back picks by the arrangement of 2 : 1. Repeat 16 by 24.

#### GRANITE WEAVES.

Fig. 51 is the face weave, and

Fig. 52 the same arranged with backing picks. Every warp-thread is used once in the repeat of the weave for hitching the back picks to the face structure. Repeat of weave 10 by 15.

#### Arrangement 2 Face : 1 Back : 1 Face : 1 Back.

If the arrangement of 1 Face : 1 Back results in a fabric structure too heavy, and that of 2 Face : 1 Back in one too light, we may combine both arrangements, *i. e.*, use 2 Face : 1 Back : 1 Face : 1 Back. Again the nature of the interlacing of the surface weave may be such that this arrangement is the only one at our disposal for perfect stitching of the backing.

Weaves Fig. 53, 54, 55 and 56 explain the subject.

Fig. 53 is the common 6-harness twill and

Fig. 54 shows the arrangement of the latter for back picks, using every warp-thread uniformly for holding the back picks. Repeat 6 by 30.

Fig. 55 is a fancy twill, repeating on 12 by 12 and

Fig. 56 shows the latter arranged for back picks. In the same, warp-threads 1, 4, 7-10 are hitched twice and the remaining warp-threads only once in the repeat of the weave. Repeat: 12 by 20.

(To be continued.)

#### DYEING ARTIFICIAL SILKS.

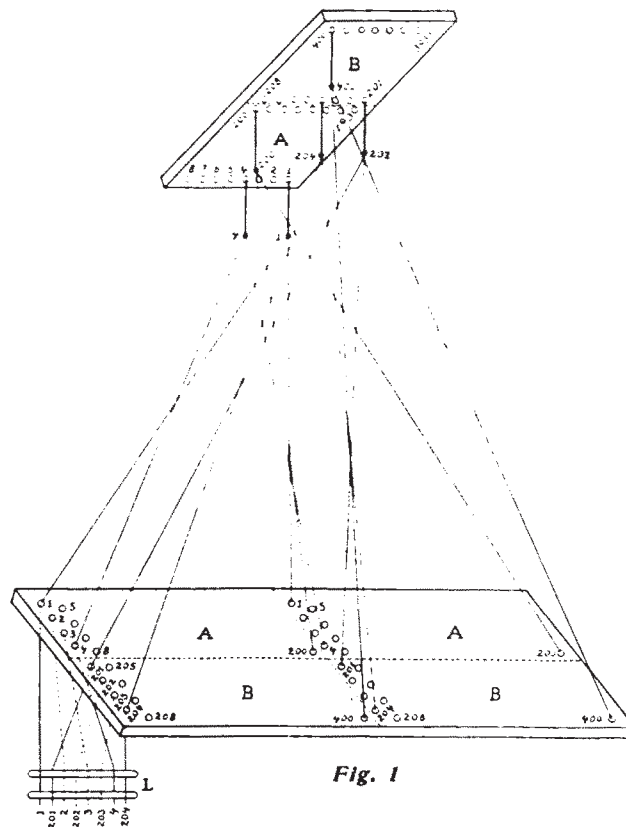
Customarily, artificial silk is dyed in much larger baths than for cotton, in order to lessen the difficulties met with in producing level dyeings. The solution of the dyestuff should always be added to the dyeing liquor by passing it through a sieve so as to catch any undissolved particles that may be present. Add the solution of the dyestuff in several portions. When it is intended to dye light shades the material should be wetted-out beforehand.

RECIPE FOR GREY THREAD POLISH.—16 gallons of water, at 170 deg. *F*; 9 lbs. starch, mixed in cold water, and 1 lb. yellow wax. If a bright polish is required, 1 more gallon of water, at 170 deg. *F*. should be added.

#### JACQUARD TERRY PILE FABRICS.

In the March 1908 issue of *Posselt's Textile Journal*, we gave a thorough description of the construction of these fabrics, accompanied with weaves and sections of fabrics, executed on the harness loom, and to which the reader is referred to, the object of the present article being to explain the designing and card stamping as practiced with figured, *i. e.*, Jacquard fabrics, used for bath-ropes, scarfs, etc.

In the manufacture of these fabrics two systems of warp (on two beams) are necessary; the pile warp for the formation of the loop, and the ground warp for forming the body of the fabric. Only one system of filling is used.



In the process of weaving these fabrics, the terry series of the warp is weighted looser than the ground or body series, or its warp beam arranged to let off the proper length of pile warp required at every third (the tight) pick; in either case allowing the loops to be formed on the face or back of the fabric, as desired by the weave, by the lay swinging or being driven fully up to the fell of the cloth every third pick, the two previously inserted picks having been but partially beaten up. The three picks so interwoven slide on the ground warp, which is held under a tight tension during the entire process of weaving.

#### Making of the Jacquard Design Using One System of Pile Warp Only.

The same is very simple, they closely resemble the designs for damask fabrics executed with compound harnesses. In other words, the figure (design) is simply painted in red on the point paper, without

requiring any weave to be put in, the loom doing the interlacing. In this manner, on all the places where painted on the point paper, the loops will form themselves on one side of the fabric, vice versa those places not painted on the point paper, and when the loops will form themselves on the other side of the fabric, in either case those portions in the fabric where loops are formed on one side being smooth on the reverse side, the figuring being done on either side by means of figuring with loops (technically called terry pile) upon plain rib, *i. e.*, a plain woven ground as we might call it. In this way the design will be reversed with reference to both sides of the fabric, since on one side the figure part will be executed in loops or raised effect and the ground in regular weaving, vice versa the other side of the fabric, and when the ground part of the design will appear in loop, *i. e.*, raised effect and the figure part in regular weaving.

### The Jacquard Harness

for these fabrics can be tied up in three different ways:

(1) In two sections, using one section for the ground warp and the other section for the pile warp.

Fig. 1 shows the plan for this method of tie-up for a 400 Jacquard machine (no notice of reverse row is taken). The principle of threading observed in either section is straight through. From the diagram, it will be seen that the machine and the comberboard are divided into two even parts, marked in both instances *A* and *B*, respectively.

In the rear section *A* of the comberboard, we threaded, on a straight through tie-up, the harness cords as operated by neck cords protruding from section *A* of the bottom board of the Jacquard machine. In a similar way the front section *B* of the comberboard carries on a straight through tie-up, the harness cords as operated by the neck cords protruding from section *B* of the bottom board of the Jacquard machine.

The Jacquard machine used for explaining subject is a 400 machine, with 200 needles, hooks and neck cords, for each section, using

needles, etc. 1 — 200 for section *A*.

needles, etc. 201 — 400 for section *B*.

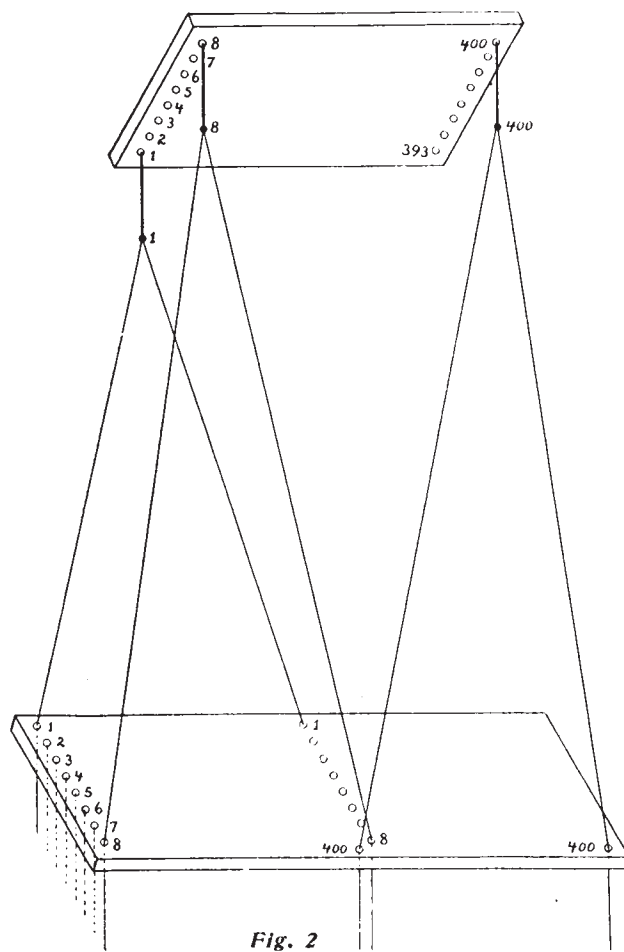
Only the first and the last row of each section of the bottom board of the Jacquard machine are indicated in diagram, so as not to bewilder the reader with too many numerals, etc., in the illustration.

The comberboard is shown (for example) arranged for 2 divisions, explaining at the same time any number of divisions that may be called for, to suit texture and width of a fabric under consideration.

The threading of each division of the comberboard will start on its first row deep with harness cords from leashes 1, 2, 3, and 4 for section *A*, and 201, 202, 203 and 204 for section *B*; followed on the second row deep with harness cords from leashes 5, 6, 7 and 8 for section *A* and 205, 206, 207 and 208 for section *B*, until ending the tying up of the harness on the fiftieth row deep of the comberboard with harness cords from leashes 197, 198, 199 and 200 for section *A* and 397, 398, 399 and 400 for section *B*.

To simplify illustration to the reader, only such harness cords are shown threaded in the comberboard as are required to guide in understanding subject, *vis*: first and last harness cords for first row of each section (1, 4, 201 and 204) and the last harness cord of the last row (50th) for each section (200 and 400).

The leasing of the harness cords, for the purpose of drawing-in the warp, is always done by alternately, threading one thread from section *A* and that of section *B*, as shown in diagram at *L*, below the comberboard.



Section *A* in the Jacquard machine as well as in the comberboard, later on when explaining the making of the design as well as card stamping, we referred to as operating the ground warp, and section *B* the terry pile warp. The reverse plan might have been observed, without changing the principle of designing nor that of card stamping.

(2) Using, in connection with a regular one-section tie-up, all the uneven numbered needles (1, 3, 5, 7, etc.) for operating the ground warp and all the even numbered needles (2, 4, 6, 8, etc.) for that of the pile warp. In this case cut the ground weave for that part of the card controlled by all the uneven numbered needles and the figure part, *i. e.*, pile warp, according to directions given later on, considering then all the even numbered needles only. This will make a somewhat complicated card stamping and will be done when only looms tied-up for one-section are at our disposal, or must be used. After one set of cards are cut on a

*Royle Piano Machine*, duplicate sets are just as conveniently procured on a *Royle Repeater*, as would be the case with any other kind of tie-up, more conveniently used for card stamping. In return for the complicated card stamping, the process of weaving will have a tendency to proceed more smoothly, since no pulling out of the way of the heddles will occur, every warp-thread, whether ground or pile, running direct from whip roll to mail and dent, the next one runs smoothly side by side in the successive mail, and so on, throughout the entire warp.

Fig. 2 shows such a plain or single section tie-up, illustrating what is known as the English system applied to a 400 Jacquard machine, tied-up (for example) with 2 divisions.

In the same the Jacquard machine is adjusted on the loom so as to have its cylinder placed parallel with the comberboard (see Fig. 1 where the arrangement is crosswise, *i. e.*, at 90°) or what means the same, running in the direction of the width of the fabric in the loom. The eight hooks of one cross-row (one



Fig. 3

hook from each of the 8 griffe bars of the Jacquard machine) runs in the direction from the cloth beam towards the warp beam. Having the same number of rows in depth in the comberboard as there are griffe bars, one may readily see the advantages of this tie-up.

The first row, in depth of the comberboard, contains harness cords from neck cords 1, 2, 3, 4, 5, 6, 7 and 8. The second row deep of the comberboard contains harness cords from neck cords 9, 10, 11, 12, 13, 14, 15 and 16, finishing each division on the last row

(50th) with harness cords from neck cords 393, 394, 395, 396, 397, 398, 399 and 400. No notice is taken in this diagram, neither in Fig. 1, of any reverse rows the same being optional.

(3) Use 4 harness in front of the comberboard for operating the ground warp, using the Jacquard machine tied up straight, in one section, as was shown in Fig. 2, for the pile warp. This arrangement doubles the capacity of the Jacquard machine.

Fig. 3 shows a fabric sketch in which on the face of the fabric, the figure as shown in black, is to indicate terry pile, the ground (white) to show regular weaving. On the back of fabric structure the reverse is to be the case, *viz.*: ground effect to be produced by terry weaving, the figure effect by regular weaving.

Fig. 4 shows a portion of the point paper design prepared from sketch Fig. 3, being its lower left hand corner. This explains that designing for these fabrics is a most simple affair; painting figures on white ground is all that has to be done.

Fig. 5 shows how ground warp and pile warp interlace, referring to a portion of (part of design) Fig. 4, its lower left hand corner, comprising 36 vertical rows of squares, and 14 horizontal rows of squares. At the left hand sides of analysis Fig. 5 the interlacing of the first 8 ground or body warp threads for 42 picks is shown by means of *dot* type. The remaining part of the analysis shows the interlacing of 36 pile warp-threads for 42 picks.

The arrangement of the two systems of warp in the fabric structure is:

1 end ground (*dot* and *empty* squares) to alternate with

1 end pile (*full*, *cross*, and *empty* squares).

With reference to picks, every horizontal row of squares in point paper design Fig. 4 stands for 3-picks in the analysis Fig. 5, *i. e.*, in the loom, *viz.*:

1 pick Figure up  
1 " Ground "  
1 " Figure "

—  
3 picks to the round.

Analysis Fig. 5 is more particularly given to illustrate explanations as to card stamping direct from the point paper design (See Fig. 4).

CUTTING CARDS FOR A TWO-SECTION TIE-UP.  
(See Fig. 1.)

First Section	Second Section
Ground Warp	Pile Warp.
Card 1 <sup>a</sup> Cut: 1, 3, 5, 7, etc.	Cut: Figure in Fig. 4
" 1 <sup>b</sup> Cut: 1, 3, 5, 7, "	Cut: Ground in Fig. 4
" 1 <sup>c</sup> Cut: 2, 4, 6, 8, "	Cut: Figure in Fig. 4

*Figure* means black on point paper design Fig. 4, or red on the point paper design in the mill.

*Ground* in either case means white, or empty.

Explanations given show how to cut three cards from one horizontal row of the point paper design, the cards for this purpose being respectively marked *a*, *b*, and *c*, thus there are

$$(15 \times 8 = 120 \times 3 = 360)$$

360 cards indicated in the portion of the point paper design illustrated by Fig. 4.



CUTTING CARDS FOR ONE-SECTION TIE-UP.  
(See Fig. 2.)



Fig. 4

Cut on a *Royle Repeater* your ground weave for rows of needles 1, 3, 5 and 7; using for cards *a* and *b* "cut rows 1 and 5" card *c* "cut rows 3 and 7"

Next take out of the *Royle Piano Machine* punches 1, 3, 5 and 7 and cut your pile weave on rows of needles (punches) 2, 4, 6 and 8.

Rule off your point paper design for this purpose in *fours*, if referring to an 8-row, *i. e.*, 400 machine.

On cards mark *a* cut Figure  
" " " *b* " Ground  
" " " *c* " Figure.

If referring to a 600 machine (12 rows) rule off your design in *sixes* and use:

Punches 1, 3, 5, 7, 9, 11 for ground, and  
" 2, 4, 6, 8, 10 and 12 for figure,

or vice versa, according to where you locate ground and figure respectively, either one or the other taken first.

CUTTING CARDS FOR ONE-SECTION TIE-UP HAVING FRONT-HARNESS ATTACHED.

The latter carry the ground warp and interlace, provided four harnesses are used, thus:

Front Harnesses 1 and 3: 2 up 1 down  
" " 2 " 4: 2 down 1 up.

The Jacquard Harness is then completely used for the pile warp, and the cards stamped thus:

On cards marked *a* cut Figure  
" " " *b* " Ground  
" " " *c* " Figure.

The point paper design is in this case ruled off to correspond to the number of rows of needles in the machine, *viz*:

*a* 400 machine in eights,  
" 600 " " twelfths.

Showing Full Terry Pile on Both Sides of the Fabric.

CUTTING CARDS FOR A THREE-SECTION TIE-UP.

This arrangement is made use of when a full pile, *i. e.*, loops of each color, are required on face and back of the fabric. The Jacquard machine, as well as the comberboard, each then is divided into three sections, *viz*:

- Section 1 to operate the ground or body warp.
- Section 2 to operate Figure warp #1, or figure effect of the design as we call it.
- Section 3 to operate Figure warp #2, or ground effect of our design as we call it.

Figure 6 is given to illustrate the interlacing of the ground or body warp by means of eight warp-threads shown at the left of the diagram in *dot* type the other portion of said diagram showing the actual interlacing of both pile warps.

First Section  
Ground Warp.

Card 1<sup>a</sup> Cut: 1, 3, 5, 7 etc.  
" 1<sup>b</sup> Cut: 1, 3, 5, 7 "  
" 1<sup>c</sup> Cut: 2, 4, 6, 8 "

Second Section  
Pile Warp #1.

Third Section  
Pile Warp #2.

Cut: Figure in Fig. 4      Cut: Ground in Fig. 4  
Cut: Ground in Fig. 4      Cut: Figure in Fig. 4  
Cut: Figure in Fig. 4      Cut: Ground in Fig. 4

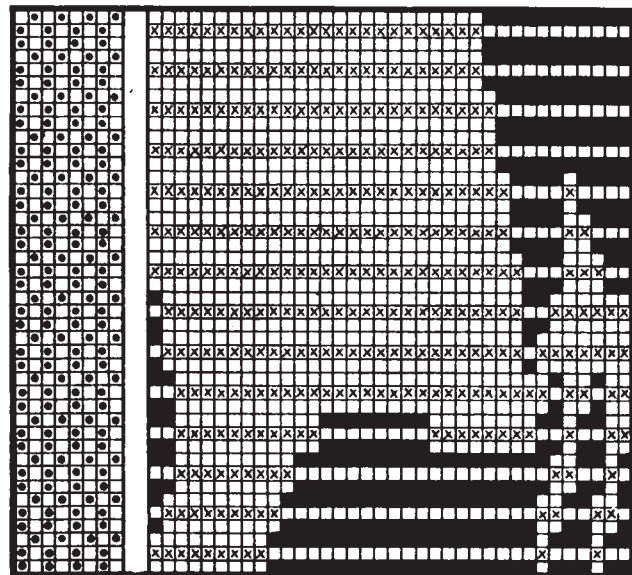


Fig. 5

Figure warp # 1 means warp used for figure effect in design on face of fabric; *full* and *shaded* squares in diagram Fig. 6.

Figure warp #2 means warp used for ground effect in design on face of fabric; *cross* and *white dot* squares in diagram Fig. 6.

Figure means black on point paper design Fig. 4, or red in a corresponding mill design.

Ground in either case means white or empty.

Explanations given show the direction for cutting three cards from one horizontal row of the point paper design Fig. 4, the cards being marked respectively *a*, *b*, and *c*.

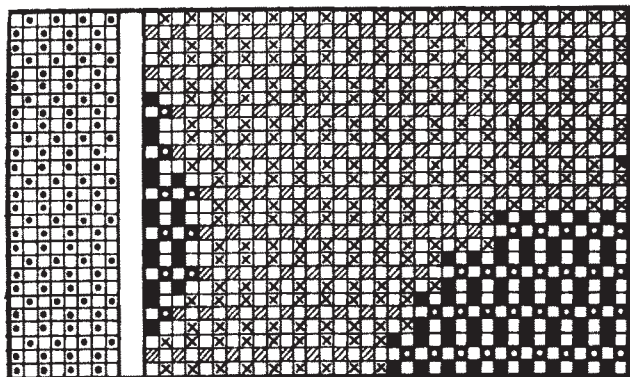


Fig. 6

Considering the pile warp analysis given in the right hand portion of diagram Fig. 6 and representing the interlacing of the two sets of pile warps, it will be readily seen that on any part of the design, where one system or set of the pile-warp-threads (see *full* squares) interlaces for 2 successive taken picks up, in order to produce the terry loop on top or the face of the fabric, the respective mate threads of the other system or set of pile-warp-threads (see *empty* squares) interlace always for the same 2 picks down, in order to produce the mate terry loop down or on the reverse side of the fabric structure. Both systems of pile warp-threads in unison, produce the face as well as the reverse side of the fabric, both exchanging positions as directed by the design.

*Shaded* type shows the interlacing when the figure pile warp forms loops on the reverse side, *i. e.*, indicates the hitching of these loops (not visible on the face) to the body of the fabric structure.

*White dot* type shows the interlacing when the ground pile warp forms loops on the reverse side, *i. e.*, indicates the hitching of these loops (not visible on the face) to the body of the fabric structure.

In connection with the headings of these fabrics, the same are, as a rule, woven smooth, *i. e.*, minus any terry pile. To accomplish this, cut cards thus:

FOR TWO-SECTION TIE-UPS.

<i>First Section</i>	<i>Second Section</i>
Ground Warp.	Pile Warp.
Cards <i>a</i> Cut: 1, 3, 5, 7 etc.	Cut: 1, 3, 5, 7 etc.
" <i>b</i> Cut: 1, 3, 5, 7 "	Cut: 2, 4, 6, 8 "
" <i>c</i> Cut: 2, 4, 6, 8 "	Cut: 1, 3, 5, 7 "

FOR ONE-SECTION TIE-UP.

Cards <i>a</i> Cut: 1, 2, 5, 6 etc.
" <i>b</i> Cut: 1, 4, 5, 8 "
" <i>c</i> Cut: 2, 3, 6, 7 "

FOR ONE-SECTION AND FRONT HARNESSES.

Cards <i>a</i> Harness 1 and 3	Jacquard: 1, 3, 5, 7 etc.
" <i>b</i> " 1 " 3	" 2, 4, 6, 8 "
" <i>c</i> " 2 " 4	" 1, 3, 5, 7 "

FOR THREE-SECTION TIE-UPS.

*First Section*

Ground Warp.

Cards *a* Cut: 1, 3, 5, 7 etc.

" *b* Cut: 1, 3, 5, 7 "

" *c* Cut: 2, 4, 6, 8 "

*Second Section*

Pile Warp #1.

All Taken

Missed

All Taken

*Third Section*

Pile Warp #2.

Missed

All Taken

Missed

In case of dealing with extra large designs and when tying up a new Jacquard harness, we can divide the Jacquard machine unevenly, allowing a greater number of hooks and needles for the design (pile warp) and a less number for the ground warp, the latter hooks carrying then proportionately more harness cords (heddles) than those for the pile warp.

FABRIC ANALYSIS.

(Continued from May issue.)

Ascertaining the Quantities of the Various Fibres in Union Yarns and Fabrics.

Results are based upon the fact that different fibres, under different reagents, are either dissolved or not. This principle forms the basis for separating one fibre from the other in union yarns or fabrics. For instance, caustic soda dissolves wool but not cotton; again, boiling in dilute or steeping in concentrated sulphuric acid dissolves (carbonizes) the latter, but not the wool.

In most cases, results near enough for ordinary purposes can be obtained by treating the yarns or fabrics in their ordinary state, *i. e.*, containing the same moisture as the surrounding air, but by far the most accurate determinations are obtained by first of all "conditioning" the material, *i. e.*, heating the same in an enclosed air space to 220 deg. F., until a constant is obtained, then basing all calculations on this conditioned weight.

TESTING FOR WOOL IN COTTON.

(a) Cut three samples of equal weight, say 50 grains; one of these samples keep for reference.

(b) Test samples 2 and 3 for sizing and dyestuffs by boiling them for about 15 minutes in either a 3 per cent solution of hydrochloric acid or 1% per cent solution of caustic soda. If liquid becomes strongly colored repeat procedure with a fresh acid bath. Next wash both samples thoroughly in several changes of water. It now depends on the estimated proportion of wool or cotton present which reagent to use; it being advisable to use the one which leaves the larger amount of refuse (in our example cotton, hence caustic soda the reagent to use).

(c) Test sample 3 for percentage of wool and cotton present, by boiling it in a 5 per cent solution of