ALPACA LININGS.

Irene.

Warp: 2/90's black cotton, 84 threads per inch.
Filling: 69 picks per inch, 30's alpaca (grey cloth).
Weave: $\frac{2}{1}$ 3-harness twill.

Albert.

Warp: 50's black cotton, 93 threads per inch.
Filling: 108 picks per inch, 40's alpaca (grey cloth).
Weave: $\frac{3}{1}$ 4-harness twill.

Beatrice.

The same is met with in three textures, *viz:*

(*a*) *Warp:* 44's black cotton, 90 threads per inch.
Filling: 78 picks per inch, 28's alpaca (grey cloth).

(*b*) *Warp:* 50's black cotton, 98 threads per inch.
Filling: 88 picks per inch, 34's alpaca (grey cloth).

(*c*) *Warp:* 50's black cotton, 84 threads per inch.
Filling: 81 picks per inch, 40's alpaca.
Weave: $\frac{4}{1}$ 5-harness twill, for all three structures.

Mabel.

Warp: 2/70's black cotton, 86 threads per inch.
Filling: 72 picks per inch, 26's alpaca (grey cloth).
Weave: $\frac{5}{1}$ 6-harness twill.

Hilda.

Warp: 20's black cotton, 66 threads per inch.
Filling: 68 picks per inch, 40's alpaca (grey cloth).
Weave: $\frac{6}{1}$ 7-harness twill.

Emperor.

The same is met with in three textures, *viz:*

(*a*) *Warp:* 44's black cotton, 94 threads per inch.
Filling: 108 picks per inch, 30's alpaca (grey cloth).

(*b*) *Warp:* 50's black cotton, 76 (double) threads per inch.
Filling: 93 picks per inch, 24's alpaca (grey cloth).

(*c*) *Warp:* 25's black cotton, 84 threads per inch.
Filling: 76 picks per inch, 28's alpaca (grey cloth).
Weave: $\frac{7}{1}$ 8-harness twill, for all three structures.

Serge.

The same is met with in three textures, *viz:*

(*a*) *Warp:* 50's black cotton, 88 threads per inch.
Filling: 106 picks per inch, 40's alpaca (grey cloth).

(*b*) *Warp:* 2/100's black cotton, 90 threads per inch.
Filling: 90 picks per inch, 40's alpaca (grey cloth).
Weave: $\frac{3}{1}\frac{1}{1}$ 6-harness twill, for both structures.

Princess.

Warp: 50's black cotton, 94 threads per inch.
Filling: 100 picks per inch, 40's alpaca (grey cloth).
Weave: $\frac{5}{1}\frac{1}{1}$ 8-harness twill.

Verona.

Warp: 40's black cotton, 90 threads per inch.
Filling: 76 picks per inch, 24's alpaca (grey cloth).
Weave: $\frac{5}{2}\frac{1}{2}$ 10-harness twill.

Victoria.

Warp: 50's black cotton, 85 threads per inch.
Filling: 82 picks per inch, 40's alpaca (grey cloth).
Weave: $\frac{4}{1}\frac{1}{1}$ 7-harness twill.

Alexander.

Warp: 30's black cotton, 82 threads per inch.
Filling: 70 picks per inch, 24's alpaca (grey cloth).
Weave: $\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}$ 16-harness twill.

Designing and Fabric Structure of Jacquard Silks.

FIGURING WITH AN EXTRA FILLING.

(Continued from page 119.)

Planning the Point Paper Design.

Having produced our fabric sketch and ascertained texture of fabric to be made, also the size of the Jacquard machine at our disposal, we now can proceed with planning the point paper design.

Texture of fabric in the loom as previously stated is 80 by 80, hence an evenly squared-off point paper must be used, say 8×8, 10×10 or 12×12.

In our case, using an 8 row Jacquard machine, we naturally reflect on an 8×8 paper, in order to save over-ruling of the point paper design for the card stamping. If example would refer to a 600 Jacquard or a French index machine, both of which are 12 deep machines, using a 12×12 point paper would then be the point paper to use. Always be careful when selecting your point paper that the rows of the Jacquard machine are the same as the number of small squares in one of the heavy over-ruled squares in the point paper, considering the squares for the warp threads for this purpose.

With reference to the number of picks per inch, no notice is taken of the ground picks, since the cards for these picks are cut separate and laced afterwards, card for card, with those cut for the figure picks.

Repeat of sketch Fig. 5, filling ways, is $2\frac{1}{2}$ inches $\times 80$ figure picks per inch $= 200$ figure cards to cut, *i.e.*, planned on the point paper design to be made, plus 200 cards for the ground weave, since the arrangement of figure and ground picks is as 1 : 1. This will give us 400 Jacquard cards for the set of cards needed for the loom.

200 by 200 for the point paper design equals ($200 \div 8 =$) 25 heavy squares of 8×8 paper, as the size for our point paper design.

Fig. 6 shows sketch Fig. 5 transferred, *i. e.*, painted in these 25×25 heavy squares, showing 200 warp-threads and the 200 figure picks painted out, *i. e.*, the working design for the card stamping on a Royle Piano machine.

The floating of the filling is always painted out on these designs (easier work, and a clearer effect) hence at card stamping this set of figure cards, *empty* squares have to be cut, *full squares* missed.

Design Fig. 6 also shows the stitching of any excessive filling floats, using for this purpose satin spots in the best possible position to catch any excessive long floats.

Selecting Weave for Ground.

We next come to the selection of the weave for the ground structure. In our example we used the 10-harness granite weave Fig. 7. Care must be taken when selecting this ground weave that its repeat is evenly divisible into the number of warp-threads as well as figure picks of the design. This is the case with our granite weave selected, since the design Fig. 6 calls for 200 warp-threads and 200 figure picks, and 10 warp-threads and 10 picks, *i. e.*, the repeat of the ground weave, are a multiple of the 200. This ground weave, a neat little granite weave, must be cut 20 times over to give us the 200 Jacquard cards for the loom required to balance the 200 Jacquard cards (figure picks) of the design Fig. 6. Use one ground card to alternate with one figure card, when lacing the set of cards.

Thus the execution of sketch Fig. 5 requires for one repeat on the loom:

200 warp threads and 200 figure cards
+ 200 ground cards or
400 Jacquard cards, total.

that the figure pick is floating on the back, when not called for by the design on the face of the fabric. In a design, of a character like ours, this feature of the filling floating on the back of the fabric would not be so great a disadvantage, however, there are any number of designs where excessive floating would occur, in

Fig. 6

Analysis of Fabric Structures.

In Fig. 8, the analysis of the plan of weaving is given. Picks 1, 3, 5 etc. are the ground picks, see *dot* type; all the even number picks, see *full* type, are the figure picks. The *dot* type and *full* type is for warp up, or is the reverse effect as used in design Fig. 6. This portion of the plan of the complete weave Fig. 8, calls for 100 warp-threads and 32 picks, illustrating the interlacing in the fabric of 100 warp-threads and 16 picks of the design Fig. 6, taken from its left hand lower corner.

In the analysis of fabric structure Fig. 8, we see turn proving a disadvantage to the fabric structure, except the said floating picks, known as bridge threads, are cut off by special machinery. If the latter is not done, large floating figure picks can be stitched (not visible on the face) to the ground structure. This subject is clearly explained by means of Figs. 9 and 10. Considering *full* type only in Fig. 9, it is a duplicate of 100 warp-threads and 32 picks of the lower left hand corner of the complete design Fig. 6. The *dot* type indicates the places where the filling, when floating on the back of the cloth, is to be stitched (not visible on face) to the ground structure. The ar-

rangement of this stitch, is the 8-leaf satin.

The weave for the ground structure and the weave for the stitching must be well understood by the designer, they each must be of such a character so as to make their combinations possible, without showing the floating picks on the face at any place of stitching, *i.e.*, the interlacing must be done by the warp being down on the pick preceding and the pick following the figure pick, where said warp-thread has to interlace; or, in other words, three sinkers must always show in rotation wherever the warp-threads stitch the figure picks on the back, to the fabric structure. Fig. 10 shows the working plan of the lower half of the design portion Fig. 9, *i. e.*, the first 16 picks of design Fig. 9, are shown in combination with 16 ground picks. For ground weave we selected the 4-harness, even sided twill (see *dot* type) and which weave permits a perfect stitching with the 8-leaf satin as used for stitching the figure picks, when floating on the back, to the fabric structure.

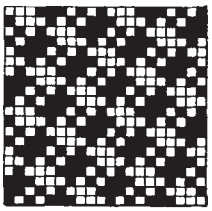

Fig. 7

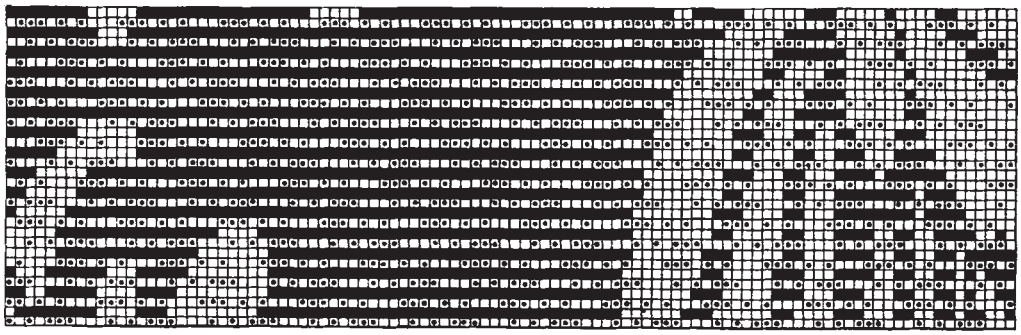

Fig. 8

Imperfections to Piece-Dyed Woolens.

By F. H. Farwell.

There are any number of possible defects that may arise in the dyeing of woolen piece goods. The same may be classified in such as affect the general appearance of the cloth, and into such which lower its quality.

The fault affecting most the appearance of the goods is without question that of uneven dyeing, and which is usually more pronounced in the case of plain woven goods than in such as are interlaced with fancy weaves. In either case it is a serious fault, may be caused by using a wrong method of manipulation or an unsuitable method of application, either of which should not occur with a competent boss dyer.

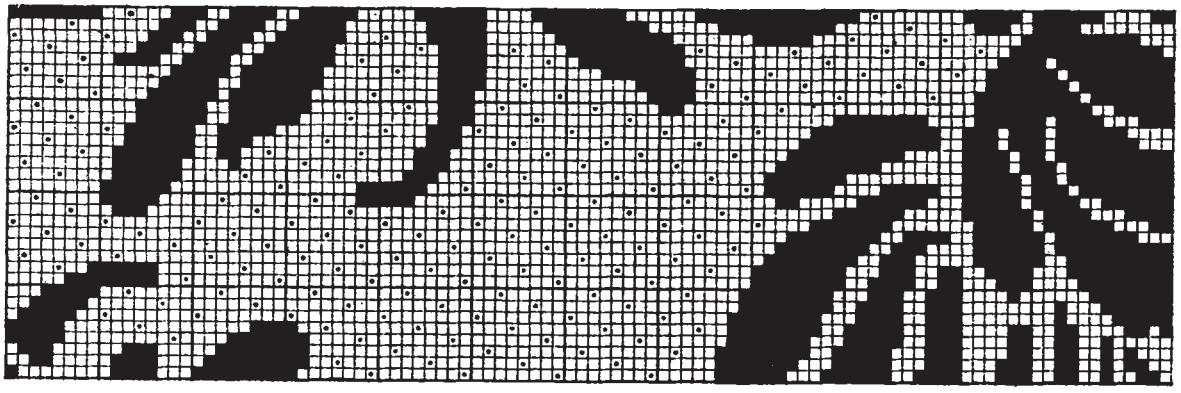

Fig. 9

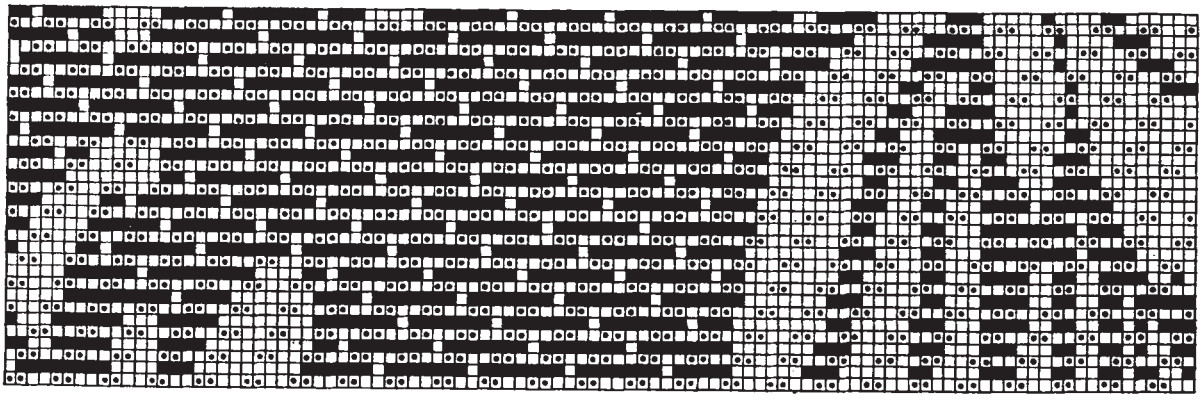

Fig. 10

Unevenness in color may unexpectedly make its appearance when it is necessary that two or more dyestuffs in their combination have to be used, for the attaining of a required color; for instance if dealing with drabs and other light compound shades. It is here that a careful selection should be made before-

hand of the coloring matters to be associated together, because it is well known, or should be at least so, that not all dyestuffs even if belonging to one class exhibit the capacity of working properly with certain other members of the same group. This is a possible source of faults that should be borne in mind by any dyer.

Imperfect and irregular treatment of the dyed goods during the finishing may also give rise to uneven colors.

At the finishing stages, woolens dyed in light compound shades should receive very careful attention, remembering that each operation after the dyeing is conducted at some extent at the cost of affecting the color of the goods handled. For this reason finishing must be carried on in such a way so as to subject the fabric only to the proper amount of work necessary to accomplish the required finish. Do not miscalculate your work and thus have to do it over and thus subject the fabric to unnecessary work, which may influence its original dyed color.

In order to protect himself against any trouble made in the various finishing processes the fabric is subjected to, it will be advisable for the dyer to keep for future reference a cutting from the dyed goods to show afterwards their color when they were passed on to the care of the finisher and any trouble is to occur.

Another fault which may arise rests in complaints being made as to the fastness of the dyeing. The color may be regarded by the superintendent or the commission house as not sufficiently fast to friction, or to light. This explains that it is necessary that the dyer to possess an intimate knowledge of the likely behavior of the colors he had used to the various processes of finishing the fabric in question is subjected to.

A frequently occurring defect seriously affecting the appearance of the goods is that of stains, or spotted effects. It is not in all instances an easy matter to discover the origin of this fault. Each case calls for especial investigation.

Stains may be due to the presence of dirt, oil, rust, resinous matters, soap remains, particles of imperfectly dissolved coloring matter, lime salts, or droppings from ceilings, etc. A careful investigation of the matter should disclose the cause of the trouble, but there will be cases met with in which the cause cannot be discovered, and many times remains a mystery to the management of the mill.

A fact from mill life will serve as an illustration. A navy blue dyed doeskin showed after the dyeing greenish-blue stains here and there, irregularly throughout the pieces. The fault was much more apparent when the material was viewed by transmitted light than reflected. Every possible effort was made to discover the cause, but without avail. Six months afterwards the same fault occurred again, and after many attempts to remove the stains there was left nothing for it but to dye the faulty goods black. Approaching the matter from mere inference, attention was confined to the preliminary scouring operation, and without having any specific fault to find with the scouring agents in use, others were tried, with the result that the rather costly trouble was at last got rid of.

Some years ago the boss dyer of one of our most prominent worsted mills, wrote us about trouble he had with different shades at the sides of the goods. After investigating the matter we called his attention to an article in the Journal on selvedges and reeding the warp. His superintendent caught the advice, cut every warp out of the loom, re-reeded it, and there was perfect shading woven thereafter, although previously to that the blame was put on the dyer.

Such mysterious instances occur in practice rather oftener than many concerned with the management of a mill would care to admit.

The possibility of the occurrence of stains of one sort or another in the dyed goods has made it a necessity in mills of reputation to provide for the overlooking of the dyed goods by experienced persons before the cloth passes on to the finishing department. By doing this, many of the stains can be removed at this stage, by the persons entrusted with the work, by the judicious application of such agents as soap, benzene, turpentine, oxalic acid, or even hot water. This work is, however, merely a waste of time, provided that in the attempt to remove a stain the person leaves a disfiguring mark, for which reason this work can be only entrusted to an experienced, careful workman.

It will be found advisable to examine goods dyed in pale colors just after the dyeing, while in their wet state, and when any stains noticed may then be treated with benzene and soap.

Dyestuff stains should be washed out by hand as good as possible, and the cloth then boiled through the old dyeing liquor. When, however, the substantive or the alizarine dyes have been used for the production of the color in pale shades, this procedure does not suffice to remedy the defect. The only alternative is to strip the color as far as possible and dye over again. The simplest course, and the most satisfactory to all concerned, consists in dyeing the faulty goods a deeper color where circumstances permit it.

However the best and the wisest plan is to be careful and take the necessary steps to avoid the staining goods during the dyeing. This will be accomplished by foresight, carefulness, and cleanliness on the part of the dyer and his help, and is well worth the trouble.

At least once a week dyeing vessels should be examined by the boss dyer, cleaned out thoroughly, and all excess of oil removed from the bearing parts. It is a fact that in dyehouses where material, waiting to be dyed is left lying about in the same department where dyeing is proceeding, stained goods occur the most frequent.

A further fault affecting the appearance of the goods is the production of dark colored lists and so-called streaky pieces. This most always is due to the manner of mechanical manipulation during the dyeing, and is really an inexcusable fault in an experienced dyer.

Depreciation in the quality of the cloth may be brought about by over-boiling and felting in the course of dyeing. Prevention lies in attending to the pipes conveying the steam to the dyeing liquor, and in suitably controlling the speed at which the cloth is allowed to travel.

The output of the Japanese cotton spinning companies is just now showing a record-breaking increase.

According to the returns issued by the Associated Cotton Spinning Companies, the total output of yarn in Japan during February 1914 amounted to no less than 140,200 bales representing an increase of 11,777 bales over the preceding month, and of 17,798 bales as compared with February last year.