are best treated before soaping with a little weak hydrochloric acid, which removes the traces of lime that such silks contain; this acid treatment should be followed by a washing with water. The soap boiling requires to be continued for rather a longer time than is the case with ordinary silk, as, owing to the construction of the wild silk fibre, the gum extends more into the interior of the fibre than it does in the ordinary silk.

(To be continued.)

PRINTING OF WOOLLEN PIECE-GOODS.

The printing of wool is almost always carried on by means of the ordinary roller calico-printing machine, in the same manner as the printing of cotton piece-goods. Two points, however, require attention. First, the blanket and the back-cloth must be very soft, for, especially in light shades, every unevenness is noticeable, giving the goods a bad appearance. The second point is the heating of the drying-room, which cannot be too well looked after. It will take a long time before the importance of the drying is recognised, and still longer to convince the printer of this fact. The goods must dry as slowly as possible, and on coming out of the room they should, in fact, only just have become dry. Goods dried in this manner are susceptible to moisture, and readily allow steam to pass through them on a slightly moist back-cloth; whilst if they are quickly dried the pressure of the steam lies only on the surface, and a very wet back-cloth is required, which is liable to cause the colours to run into the whites. Colours dried quickly are not so brilliant as those that have been dried slowly. At one time the goods could be hung for several days after printing, and thus were slowly dried, and the colours came out brilliant; now the time is much reduced, hence the drying has to be done in a drying-room or a stove, and the after operations depend much on this being done properly. The regulation of the steam supply to the drying stove is important, but no fixed temperature or regulations can be given; the printer must regulate the supply of steam in such a manner that the goods will not rub off nor become too dry.

The preparation of the colours for printing is carried out in the same way as for calico-printing colours. They may be preserved for some time without undergoing any change, and may in general be used cold. In some cases, such as with azo-carmine, fast blue, etc., it is well to heat the colour before using. The composition of the printing colour is generally a very simple one, as, besides the colour and the thickening made from tragacanth, dextrine, or starch, an acid is added, such as oxalic, acetic, or tartaric.

The following recipes will be found useful:—

Black.—Naphthol black B, shaded with patent blue, gives good results. The printing colour is made with

52 pints water,
16 lb naphthol black B,
1 lb patent blue B,
48 pints gum tragacanth liquor,
36 lb British gum,
6 pints acetic acid,
2 lb. alum,
3½ lb. oxalic acid,

all well boiled together, then allowed to cool, when

2½ lb. sodium chlorate

is added, when the colour is ready for use.

Reds.—Any of the azo scarlets will give good results. The following is a good formula for the printing colour:—

32 pints water,
3½ lb. azo scarlet,
24 pints gum tragacanth liquor,
19 lb. British gum,
6 pints acetic acid,
1 lb alum.

Boil well together.

Bordeaux reds.—Azorubine, amaranth, and Bordeaux B each gives good results, the printing colour being on the same lines as the red above. By mixing azorubine S and naphthol black very useful prune shades are obtainable. Azo-carmine can be used with success for pale, bluish-red shades, giving fine, even shades; owing to the slight solubility of the dye-stuff in cold water it is necessary to use the printing colour warm.

Pinks.—Eosine, erythrosine, rose bengale, or rhodamine may be used, the printing colour being made as follows:—

18 oz dye-stuff,
12 pints water,
24 pints gum tragacanth liquor,
14 lb pale dextrine,

are well boiled together, then

1 lb. tartaric acid,
8 pints water,

are added to the boiling mixture.

Orange.—Any of the azo oranges may be used; the printing colour can be made in the same way as that for the reds.

Yellow.—Most of the yellows that are available suffer from the defect that they run into the whites very much. Tartrazine and milling yellow are the best, but they are expensive. The fast yellow R is also good; it can be made into a printing colour as follows:—

56 pints water,
9 lb. fast yellow R,
44 pints gum tragacanth liquor,
31 lb. British gum,
15 pints acetic acid,
1 lb. alum.

Brown.—A good brown is still required for wool printing, all those at present available being liable to run into the white, which is rather a serious defect. Reddish-brown shades can be got with dark azo reds, such as amaranth, Bordeaux, etc., shaded with naphthol black. For yellow shades of brown, there is no good brown available: one method of obtaining such is to use orange, and shade with blue or naphthol black, but the results are not very satisfactory.

Violets.—Acid violet or formyl violet S 4B may be used with good results; the latter gives fine heliotrope shades.

Green.—Acid green, printed with tartaric acid, gives good results.

Blue.—Fast blue 2B gives very good results; the printing colour is made with

52 pints water,
6½ lb. fast blue 2B,
22 pints gum tragacanth liquor,
54 lb. British gum,
13 pints acetic acid,

boiled up; to the mass is added

2 lb. tin crystals.
8 pints water.

Alkali blue may be used for pale shades, and patent blue is also useful for printing blues.—*Oestr. Wollen und Leinen Ind.*

MESSRS. READ HOLLIDAY & SONS have of late much improved the quality of their direct black, sending it out not only much stronger, but also a little cheaper than formerly. From 25 to 30% dyes on wool a fine and very fast black, in the latter respect being far superior to logwood blacks. For hat dyeing it is excellent: no black can compete with it for cheapness and fastness combined.

Designing.

NEW DESIGNS.

COTTON DRESS GOODS.

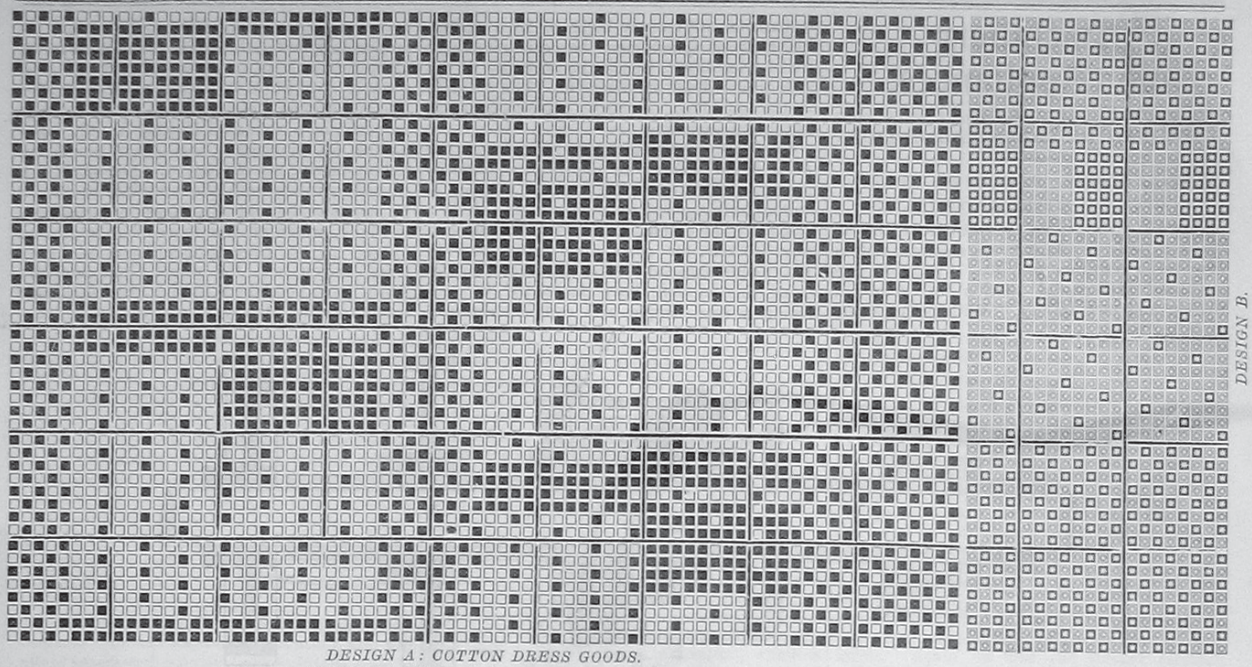
The severity of the weather, the general wearing of mourning costumes, etc., have greatly interfered with the spring production in fancy cloths. The colours which seem to be in demand at present are brown, heliotrope, grey, tan, and fawn; stripes are in favour, also large and small checks for gingham and light zephyr cloths. *Design A*, if carefully carried out in good materials (warp and weft) will give a neat, graceful stripe, which will drape well, being stylish and effective. Fast washing colours are the prominent feature in the sale of almost every class of cotton fabrics for home consumption. The design can be worked out on 8 shafts, 48 to the round, draft according to pattern required (see numbers on the right of pegging plan, which will form a guide in the drawing-in); the draft will convey some idea of how the various patterns required may be formed; 1, 2, 3, 4, are the plain or ground shafts; 5, 6, 7, 8, form a small extra warp figure on the ground, 40 dents per inch, 2 and 4 in a dent, 30's warp twist, 80 picks per inch of 24's weft.

Pattern: 8 dark heliotrope on 1, 2, 3, 4 shafts; 2 in a dent, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, 1 heliotrope, 2 white, the white on the 5th and 6th shafts; 2 in a heald; the heliotrope on 1, 2, 3, 4 shafts, four in a dent, that is, the double white and the two ends of heliotrope. By this means, as will be seen by the draft, the two of white will be between the two of heliotrope; 8 dark heliotrope on 1, 2, 3, 4 shafts, two in a dent; 2 white, 1 heliotrope as above for 16 white ends, and 7 of heliotrope, the white on 7th and 8th shafts, two in a heald; the heliotrope on 1, 2, 3, 4 shafts, and with the white 4 in a dent. Eight heliotrope on 1, 2, 3, 4 shafts, 2 in a dent. Thirty-six dark heliotrope on 1, 2, 3, 4 shafts, reeded 4 in a dent, two dents empty, and repeat from the first "8 of dark heliotrope." No mistake can possibly take place in the drawing-in, if our directions, as given in this pattern, are followed exactly. Any breadth of stripe may be made by repeated drafts over each set of shafts; weft one shuttle all white. The following variations in colour will be satisfactory: For heliotrope: brown, china, blue, red, light-green, tan, fawn, buff, and dark lilac; white to be retained in every variation to form the figure, and white weft in every case; width out of the loom 30 inches.

Design B, for a fancy stripe, will finish a decided novelty. It is on 14 shafts, 16 to the round, shafts numbered for draft guidance; 48 dents per inch, 2 and 4 in a dent of 40's warp twist, 80 picks per inch of 24's weft. *Warp pattern*: 144 white on 1, 2, 3, 4 shafts, 2 in a dent: 24 coral on 5, 6, 7, 8, 9, 10, 11, 12 shafts, 4 in a dent; 2 white, 1 dark emerald green, 2 white, 1 emerald green, 2 white, 1 emerald green, 2 white, 1 emerald green, 2 white, 1 emerald green, 2 white, four in a dent; the white two in a heald on 13 and 14 shafts; the green on 1, 2, 3, 4 shafts; 144 dark emerald green on 1, 2, 3, 4 shafts, two in a dent; 2 white, 1 emerald green, as just given for 12 white, 5 green, four in a dent; 24 coral on 5, 6, 7, 8, 9, 10, 11, 12 shafts, 4 in a dent; repeat from the "144 white." The weft, one shuttle of printed irregular block yellow, red, white, in the following order:— — — —, that is, first line yellow block, blank white, second line red, blank white; third line may be brown if three colours are desirable. It must be clearly understood, whatever may be the irregular formation of the printed thread for weft and variety of colour, a degree of harmony must be maintained, so that the warp stripes will not be degraded by undue vulgarity of loud tones; whatever may be the colours in the warp, the weft must in some way agree with them, so far as relates to white or very light tints in one stripe. The weft might be any number of colours. Not so, however, with the second stripe when of some dark hue; for instance, let this stripe be dark blue, then harmony and complement in the weft would be orange and white, or yellow and white, depending very much so far as regards the orange or yellow print in the weft upon the tone of blue in the warp stripe: if the stripe is required to be a purple, then yellow in the weft; if blue of a rather deep shade, weft orange. Some little skill, taste, and judgment are necessary in respect of wefts for this class of stripes; and if duly exercised with caution the fabric will certainly be found a valuable acquisition among fashionable novelties.

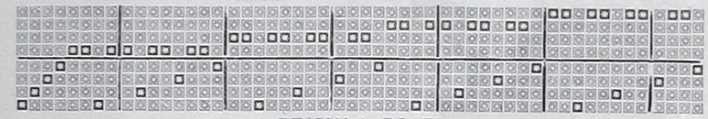
THE PRODUCTION OF TWILLED CHECKS.

The many beautiful effects producible by placing checks on end, as shewn in *Design C*, renders any means for constructing such designs on elementary principles very acceptable. The great difficulty to be surmounted is to make the various weaves combined "cut," *i.e.*, join to each other without leaving any large flushes, which, if present, attract the eye at first glance. If, then, some means, obtainable whereby a fixed order of adding to is possible, then such designs may be constructed with little fear of the defects just mentioned. In *Design C* this has been effected by running

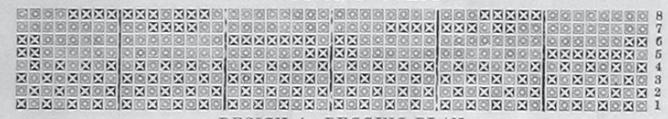


DESIGN A: COTTON DRESS GOODS.

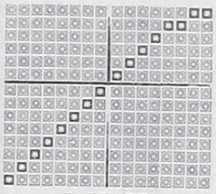
DESIGN B.



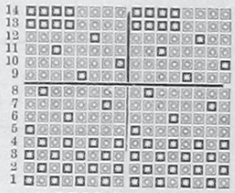
DESIGN A: DRAFT.



DESIGN A: PEGGING PLAN.



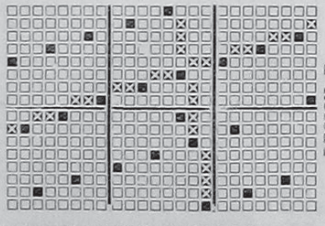
B DRAFT.



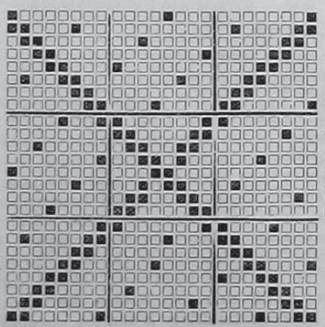
B PEGGING PLAN.

the 8-end sateen in all over the 64 threads by 64 picks, and producing the design by adding to the sateen dots. If ordinary twill is being dealt with, the sateen selected must be one which lends itself to the production of an ordinary twill in either direction. Such, for example, is the 12-end sateen, as shewn in *Design D*.

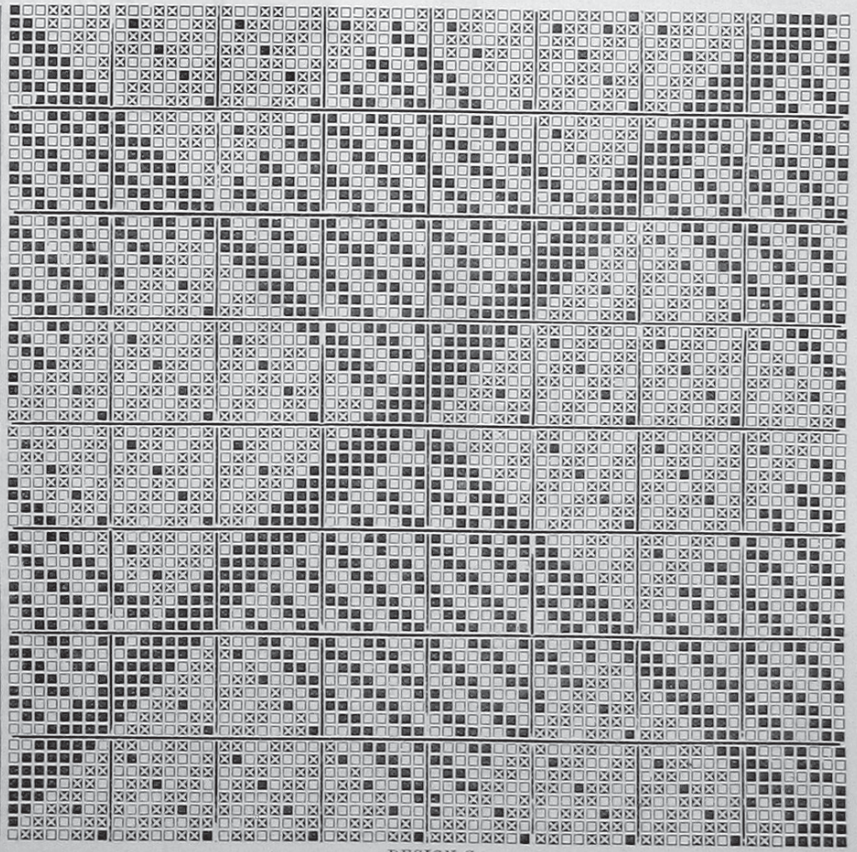
Should an upright twill combination be required, then a sateen yielding such a twill in both directions, must be made the basis of the effect, as shewn in *Design E*, which is based upon the 16-end sateen, counting five. We should recommend that all the sateens be worked out and kept for reference in such cases as this.



DESIGN E.



DESIGN D.



DESIGN C.