

Weller, and Co., which he has held for the past six years and up to the last.

HOSIERY, LACE, FLUSH.

The hosiery trade is quiet. Spring goods have been ordered in large quantities by Western houses. With reference to foreign hosiery, there have been some repeat orders for autumn goods, and prospects have improved during the past few weeks.

A new curtain fabric, by the Mitcheline process, has appeared in Philadelphia, and is being shown to buyers of fall goods. It is said the patterns are extremely beautiful, while the novelty of the material is such as to command universal admiration among those in quest of attractive goods. The company who control this novelty have also introduced a quilt made of the same style of fabric. Both the quilt and curtain come in a variety of patterns, and many different designs in colour and decoration work.

The Pioneer Plush Company of Paterson, which employs about 200 hands, is making a few velveteens, but it is principally engaged in the production of the cheaper grades of silk plushes for upholsterers and box makers. The fact that velveteens are being manufactured by this young firm is, however, one of some significance to Manchester men. Candidly, I do not think that a long period will elapse before this country is producing much larger quantities of velveteens than it is to-day. The difficulties to Americans are not insuperable.

MACHINERY NOTES.

At a recent meeting of the directors of the Portland (Me.) Plush Mill Corporation, Mr. Ackroyd was instructed to go to Europe to buy machinery, etc., and he left on the City of Paris last Wednesday. In two or three weeks President Robie or Treasurer Tilton will follow him.

It is said that German and French machinists have been making enquiries about the "Improved Duffy and Wowell spindle" made by Taylor, Shaw, and Cocker, silk machinists, of Paterson.

Reviews of Books.

THE KINDER PRINTING CO.; ITS STRANGE HISTORY. By "Kinder." Manchester: Spy Office.

This is a pamphlet unique in its way. It deals with the origin, growth, and decay of one of the best-known calico-printing concerns in the country, and although many of its pages relate to personal matters, on which we cannot be supposed to comment, there is enough information in the remaining portion of the work to repay outsiders for the labour of perusal. As a picture of life behind the scenes in a print-works the *brochure* is specially worthy of notice. There are many chatty details, too, of a friendly character, regarding well-known print men, both at the Manchester "end" and at the works of various firms, with some reminiscences of a school of print buyers, such as old Captain Farr, of Henry's (whose hats must, we fancy, be especially made for him), now rapidly passing away. As a sample of the class of information given by the author, we reproduce a cost sheet which is said to represent prices paid at the Kinder Works in 1881:—

Wages	s. d.
Drugs for bleaching	0 8
Colour	0 0½
Starch and blue	1 9
	0 2½

Brought forward	s. d.
Blankets and doctors	2 8½
Coal	0 1½
Casting	0 4
Dye-house	0 1
Sundries	0 3
	0 1
	5 6¼

This cost sheet was taken from a run of 574 pieces of 29 yards without a change of colours, and the fitting stripe all black. The style was a five-colour white ground Persian stripe, with a fitting black roller, and the goods finished pure for Constantinople. The combinations are yellow, pink, red, green, blue, and black, and the price per gallon of each colour was as follows:—

Pink	s. d.
Red	4 0
Green	10 0
Blue	7 6
Yellow	6 0
Black	4 0
	2 8

The pamphlet may be recommended to the notice of all calico-printers, being full of highly interesting material.

Designing.

THE ANALYSIS OF PATTERN.—XIV.

CHANGING THE WEIGHTS OF CLOTHS.

(Continued from page 383, Vol. vi.)

An example will, perhaps, render the demonstration of the underlying principles more easy. Therefore, suppose a cloth is found to be made to the following particulars: Warp all 36's, worsted 64 threads per inch; weft all 36's, worsted 64 picks per inch; and a cloth 1-6 heavier is required, then, evidently, 6-6 must be made into 7-6, or the weight must be increased as 6 : 7. The correct procedure is as follows:

As 7 : 6 :: 4³/₆ : 4²/₆ = 26 counts required; or as 7² : 6² :: 36 : 26 counts required,

and since the sett of a cloth must always be varied according to the square root of the counts, or diameter of the yarns employed.

As 4³/₆ : 4²/₆ :: 64 : 55 threads per inch; or as 7 : 6 :: 64 : 55 threads per inch.

This latter procedure—the reduction instead of increase of the threads per inch for extra weight, seems strange; but the following explanation will, probably, clear up the matter.

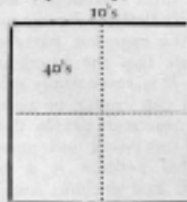


FIG. 29.

As already intimated, the counts of the cloth must not be changed in direct proportion, or a perfect cloth cannot be formed. Since, however, the counts are changed, a relatively similar change must be made in the ends per inch to preserve a perfect structure. Now changing in the proportion as 7² : 6² is a greater change than changing in the proportion as 7 : 6, for

As 7 : 6 :: 1 : 6/7 or 10/7; and as 7² : 6² :: 49 : 36 :: 1 : 36/49

so that the change made in the latter proportion gives a *less* number, and, therefore, a heavier count than the count required to give 1-6 heavier cloth. Therefore, the number of threads must be *decreased* to compensate for the heavier yarn employed. This may be demonstrated as follows: Suppose a cloth is found to be made of a 40's yarn, and it is required four times the weight; then the simplest method is to change directly by the counts, thus—

As 4 : 1 :: 40 : 10 the required counts.

Now, Figure 29 shows this to be true; but according to the correct method the change would be—

As 4² : 1² :: 40 : 2½ the correct counts required.

But 2½ counts would give a cloth four times the required weight as given by 10 counts; so this weight must be decreased four times by decreasing the number of threads—

As 4 : 1 :: 40 : 10 threads per inch,

and this is precisely the change necessary for the increase in the thickness or diameter of the yarn, viz.,

As 4² : 1² :: 40 : 10 threads per inch; or as 40 : 2½ :: 40² : 2² :: 10 threads per inch.

That this is correct the following calculations show:—

40 x 30 x 60
42 x 560 = 3½ lbs. x 4 = 12½ lbs.

for cloth 30 inches wide and 60 yards long.

10 x 30 x 60
2½ x 560 = 12½ lbs.

A still more difficult question may occur as follows:—A cloth is woven in the 2-and-2 twill weave with 64 threads and picks per inch of 2-40's yarn, and a piece is required in the 4-and-4 twill, giving an increased weight of ½th. Then

As 6² : 5² :: 25 : 8 = 17½ counts required, and as 6 : 5 :: 64 : 8 = 53½ threads per inch required for the cloth ½th heavier.

For the 4-and-4 twill, however, a further change is necessary according to the relative number of intersections in the respective weaves. Now, 8 threads of 2-and-2 twill occupy 12 diameters, while 8 threads of 4-and-4 twill only occupy 10 diameters; therefore, to change from the 2-and-2 to the 4-and-4 twill—(53½ ends ÷ 8) x 12 = 80 and 80 ÷ 10 = 8 repeats of the 4-and-4 twill x 8 = 64 threads per inch.

But this is an increase of weight in the proportion as 53½ : 64; therefore, the weight must be reduced in this proportion.

As 53½ : 64 :: 17½ : 25 counts, and as 53 : 64 :: 64 : 77 threads per inch.

Therefore, a cloth made of 2-50's yarn with 77 threads per inch, is ½th the heavier than a cloth made with the same yarns 64 threads per inch, while the perfection of structure is preserved even in changing from the 2-and-2 to the 4-and-4 twill. It should be noted that the return to the 25's counts is merely a coincidence. In decreasing the weight, the same principles apply, in a decrease of one-fifth the proportion will be

As 5 : 4 or 5/4 will become 5/4 and so on throughout.

We should always recommend the analyst to reason out important calculations, as here shown, and not to depend upon rules until the principles are thoroughly grasped.

THE WEIGHTS OF FINISHED CLOTHS.

The treatment of the relationship between the cloth woven and the cloth finished is usually ignored, or is treated in a very brief manner in most text-books; and since we have

LIST VII.

Yarn.	Counts.	Ns. of Yds. Reelod.	Greasy Weight, in Grains.	Average Greasy Wgt.	Average Scoured Weight, in Grains.	Loss per lb.
1. Grey Rotary	2/15's	100	166'5, 166'4, 166'85, 167'02	166'95	158'99	313'71 grains.
2. " " " " " " " " " "	18's	100	54'3, 53'92, 54'14, 54'25	54'35	51'7	404'6 "
3. Brown " " " " " " " " " "	20's	100	51'05, 51'04, 51'77, 51'85	51'58	49'45	289'06 "
4. Claret " " " " " " " " " "	2/56's	100	34'2, 34'1, 34'17, 34'22	34'27	31'25	508'18 "
5. White " " " " " " " " " "	40's	100		27'05	24'77	861'76 "
6. Dark Brown Cross-hred	2/16's	100	153'05, 151'42, 151'84, 151'8	152'03	148'3	172'1 "
7. Black " " " " " " " " " "	2/24's	100		97'57	92'82	340'97 "
8. Blue English " " " " " " " " " "	30's	100	40'20, 41'92, 42'02, 42'07	41'55	40'87	114'51 "
9. White Woolen " " " " " " " " " "	36 sk.	100		73'15	67'15	574'06 "

* The colour should be stated, since some colours (such as indigo) are liable to affect the results.

been at some trouble in collecting the following particulars, we trust they may prove useful to our readers, and an inducement to further minute research in the matter.

It is a comparatively easy matter to calculate the weight of a cloth as woven, but it is quite another matter to estimate the weight per yard when finished. The chief causes of variation are loss of oil in scouring; loss of fibre in milling; increase of weight per yard owing to contraction in length, which contraction may be varied, within certain limits, at will; and lastly, in the filling often put into cotton and cloths.

The loss of oil, etc., in scouring, must first be considered. Practically, all wool yarns are spun with oil; thus, when a yarn is delivered to a certain count, it is only that count so long as the oil remains in it; therefore, it will evidently be advantageous to ascertain the probable loss in scouring, by reeling, say, 100 yards of the yarn, accurately weighing, scouring with soap at about 95° F., drying, and leaving, say, a couple of days to regain the natural moisture, and weighing again to estimate the loss.

A series of such experiments are shown in List VII.

A curious point is here revealed, viz., that a marked difference frequently occurs in the weight of the same yarn in the same state weighed at different times. These weights have been very carefully tested, and may be taken as an indication of what actually occurs in practice, the weather materially influencing the weight of the wool; or more correctly the amount of moisture in the wool. Another point that should be carefully noted is the heat at which the yarns are scoured. This should not exceed 95° F., and guess-work will not do. (A pocket thermometer may be purchased for about 1s., which will answer every requirement for exact work, and should always be used to test the heat of the bath.)

It will be observed that only one example of woollen yarn is given, and not even one of cotton. We have not gone further into this matter, simply because the conditions will vary so much, owing to the oil in the case of woollen and filling in the case of cotton, that any further particulars than those given would really be of little service. The analyst should carefully

take a test on the lines here laid down for each yarn with which he has to deal, and this, with the following particulars, should enable him to fairly accurately estimate the weight of the finished cloth.

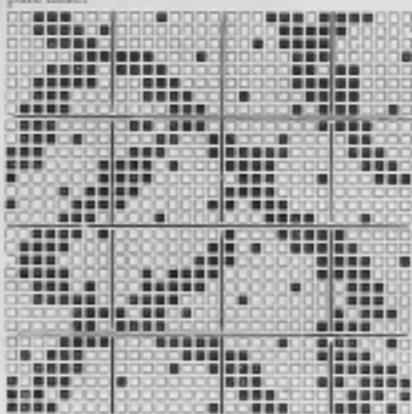
(To be continued.)

NEW DESIGNS.

COTTON DRESS GOODS, ETC.

Spots are very much in vogue at present, especially white spots on a dark-blue ground. The simplest of all, on satinette, are pretty and effective; for whether these spots be close together or far apart, large in size or small, they always stand out well on a satin material. The sea-side costumes made in this style from all-cotton warp and weft are generally white spots on a cardinal-red ground; cream, red, and blue are favourites.

For tennis dresses, cotton canvas cloths still retain their popularity; they are really much cooler for hot weather than any other washing material yet produced. Maise as a colour is coming very much to the front, especially as a foundation for gauze fabrics of pure white or pale lilac.



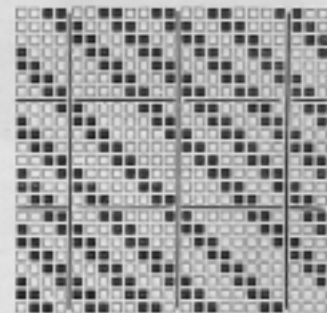
A: PEGGING PLAN.

Shaded stripes, an example of which is given in Design B, are peculiarly novel and prettily fanciful in the blendings, tones, tints, and shades, offering a very wide field of choice, and justly claiming general commendation.

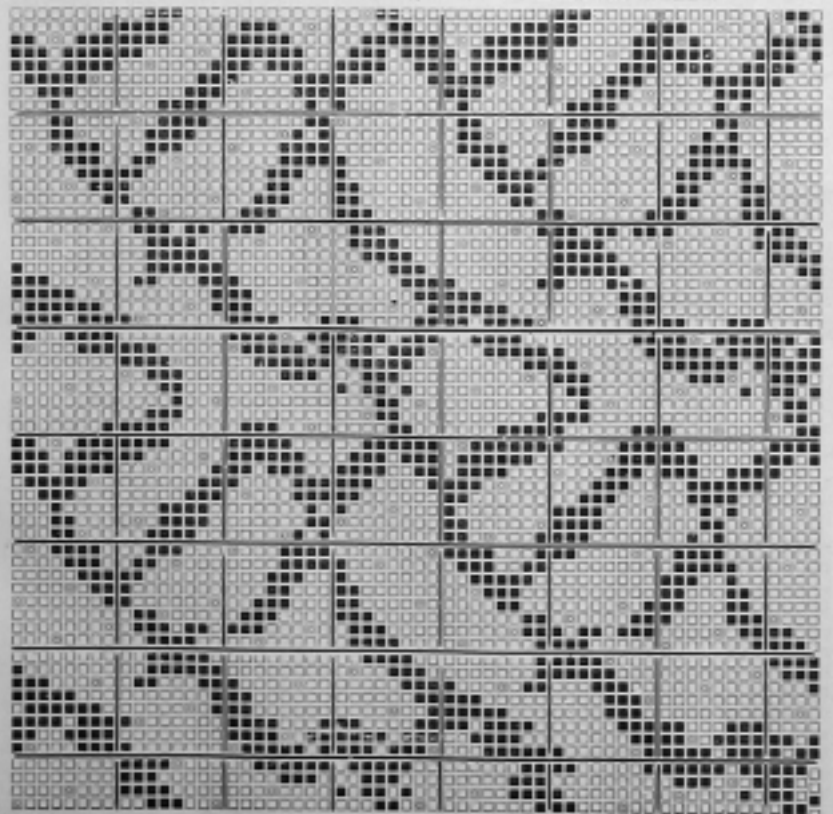
Design A will be found useful, not only as a species of ornamentation for dress and shirting goods, but by an increase of warp and weft would be very effective as a ladies' vesting pattern. It is 30 shafts, 30 to the round, straight-over draft, and may be made a warp or weft figure. The pegging plan gives the undotted squares as weft, which might with advantage be of some lustrous materials—either spun silk or linen. Warp 40's twist, in 30 dents per inch, three in a dent; weft 24's, quantity of picks to be regulated by quality of cloth required; less warp yarns for very light fabrics. In fact, as it is a suggestive design, very much may be left for consideration of materials and quantity. All light ground for warp; weft dark tones, such as cream ground, purple or brown weft, etc.

Design B will give a shaded stripe, the weft crossings breaking up the colours in the stripe from a perpendicular line, but at the same time giving each its proper effect in varied groups. Warp 30's twist, 40 dents per inch, two in a dent; weft 80 picks per inch of 30's cotton or spun silk; 25 shafts, 25 to the round, straight-over draft. We give a pattern from which any number may be formed by rearrangement of colour and increase or decrease in size of stripes.

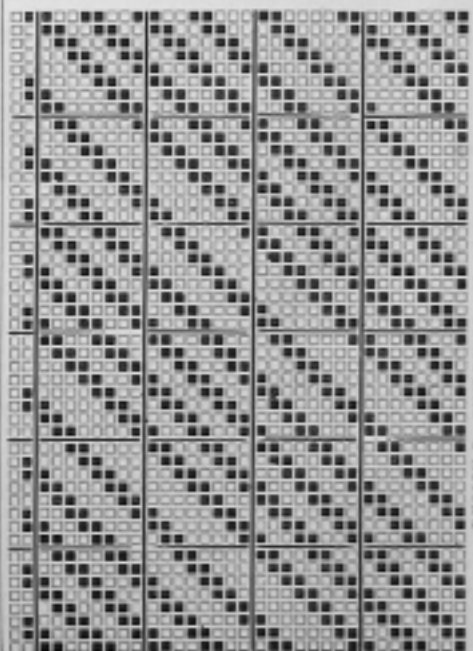
Warp pattern: 15 brown, 3 white, 15 brown, 3 white, 15 brown, 3 white, 15 royal blue, 3 white, 15 blue, 3 white, 15 blue, 3 white, 15 coral, 3 white, 15 coral, 3 white, and repeat first 15 of brown; weft all white.



B: PEGGING PLAN.



DESIGN A: DRESS GOODS, 40



DESIGN B: SHIRTINGS AND DRESS GOODS.