they were received into our spinning and weaving mills. Thus French, Germans, Russians, and Spaniards were taught our trade. This, however, occurred only on a small scale prior to the Exhibition of 1851, after which they came in shoals. It is useless now to discuss the wisdom, or otherwise, of our course of action in relation to that movement; it has borne its fruits, and we cannot roll back the current of events and begin anew. Suffice it to say that every country now has a district in competition with Lancashire, and never fails to call in the aid of the State to its assistance if our rivalry presses it hardly. Each and all have one or more striking advantages when compared with Lancashire, which do much to neutralise those we possess over them; whilst, when it is remembered that the State lends its aid on every requirement, no wonder need be felt that they capture our trade, at any rate with their own countries. This has very largely been the result in France, Germany, Russia, Italy, and Spain, and Portugal is closely following suit. The last movements made in several of these countries, and especially in France, will sweep away every vestige of our little trade that remained.

We do not care upon the present occasion to enter into the question of our national policy in relation to this matter, as we desire to point to another factor which is of great importance in the situation. This is the conduct of our working classes, who seem to have given themselves over body and soul to a number of fussy busybodies who, owing to the circumstances of their lives confining their opportunities of observation to the jenny-gate of the spinning-room, or the loom-alley of the weaving shed, have had no chance of attaining any conception of the world of conflicting interests beyond, and have certainly not sought to attain any. Yet they have come forward and have assumed the leadership of the operatives and the mastership of the establishments of their employers, and have organised the former and terrorised the latter. Professional politicians, seeing this usurped power in their hands, have paid court to them, with the result that they have got laws made wherewith to persecute every one who opposes them. They terrorise, intimidate, and boycot dissentient workpeople, as is now occurring at Nelson and Stalybridge; and compel workpeople who are earning absolutely the highest wages of any in Lancashire engaged in the same class of work to leave it, on the allegation that it is "spinning bad," as at Accrington. They go to an employer and demand that he shall dismiss almost half his staff of workers because they have not joined their Union, or the remainder will strike—which means they will neither work themselves nor permit others to work. Such a demand has been made at three large mills in Bury during the past few days. Cases of the kind we have indicated are of daily occurrence in the cotton trade, all of which are the outcome of the feeling of restlessness and insubordination to the absolutely necessary principles of order that form a part of and are inseparable from modern industries. This action is a revolt, not against tyranny but against organised industry itself, and can, if persisted in, only have one ending—the utter ruin of their employers and themselves. The trades' organisations are blind and motiveless Samsons, who are bent upon pulling down the whole fabric of civilized industry upon their heads and those of everybody else, without even the motive of revenge for any injury done them.

Now, we ask, how with such prospects as these in front of them can employers in the staple industries of Lancashire be expected to maintain it in the pre-eminent position it has attained, mainly by the genius of its inventors, the enterprise of its capitalists, and the steady industry of a generation of workers who managed their own affairs and never permitted either presidents, secretaries, or delegates to dictate to them when they should strike, but who kept such officials rigidly in their places as their servants and not their masters? This position cannot be maintained under such conditions. Consequently, we have only to ask further whether the workers of Lancashire desire to destroy the grandest industrial system the world has ever seen, and perish themselves in the ruins? If not they must change their policy.

Designing.

THE ANALYSIS OF PATTERN.—V.

FANCY COMBINATIONS.

(Continued from p. 135.)

Another type of combinations, at times of more intricate construction than the foregoing, is what are termed "fancy twills." It would be a difficult matter to draw a definite line between these and ordinary twills, since the latter are at times very extensive; but if the term "combination twill" be substituted for fancy twill its meaning is very apparent. In *Design* 9 a typical example of a combination twill is given, consisting of the combination of 8-end sateen and Mayo or Campbell, forming a twill running at an angle of 45° provided equal quantities of warp and weft be used. In *Design* 10 an example is supplied of an upright combination twill, consisting wholly of 8-end sateen and twilled hopsack.

In analysing such cloths as these, the use of the knowledge obtained by experimenting with the various makes is most effectively demonstrated. Probably the weaves first noticed by the designer for woollen and worsted coatings are the ordinary simple twills and the 8-end sateen makes. This latter make possesses the peculiarity of forming an upright twill in one direction but an ordinary twill in the other, as shewn in *Designs* 11 and 12. Now, a glance at *Design* 9 and 10 will shew that, in the first instance, the ordinary twill effect has been made the basis of the combination, while in the latter case the upright effect has been utilised for the same purpose. Thus it is evident that a knowledge of the weaves combined in these two cases will account for an apparent impossibility. Since these weaves are of a stripe type of effect, all the remarks made with reference to stripes are equally applicable here. Particular note should, however, be made of the method of combining the weaves employed, and also of the number of ends each weave occupies, which point may often be decided by the curvature of the threads and picks as already explained. Another point to which attention should be directed is that in such combinations as given in *Design* 13, a common practice is to make the fabric of woollen or worsted yarns, except every other pick, which is mohair: thus a lustrous twill is developed on a woollen or worsted ground.

BACKED CLOTHS.

Attention must now be directed to fabrics backed with warp or weft for the purpose of obtaining extra weight, warmth, and handle. In the first case we shall have two series of warp threads and one series of weft; and, in the latter case, one series of warp threads and two series of weft threads. The following procedure should be adopted in analysing these cloths:—

(1). Ascertain whether backed with warp or weft.

(2). Ascertain the relative proportions of face and backing threads or picks and counts of the same.

(3). Ascertain the face weave as a single cloth.

(4). Ascertain the backing ties.

No further reference to the first three is really requisite, but the fourth may profitably be considered more fully. In tying the backing to the face, of course under any circumstances the conditions of perfect tying must, if possible, be observed, whether warp or weft be employed. In *Diagram* 9 is shewn an interesting fact concerning the backing of the two-and-two twill: 1 is a thread taken from the face, weaving as already indicated two-and-two twill, *a* indicating two up and *b* two down; 2 is the backing thread, *c* indicating the tie. It will at once be observed that *a* and *c* always

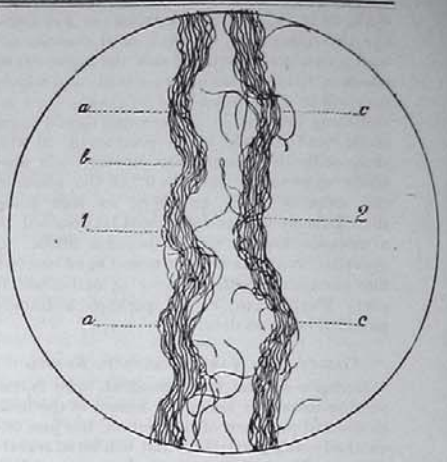


DIAGRAM 9.

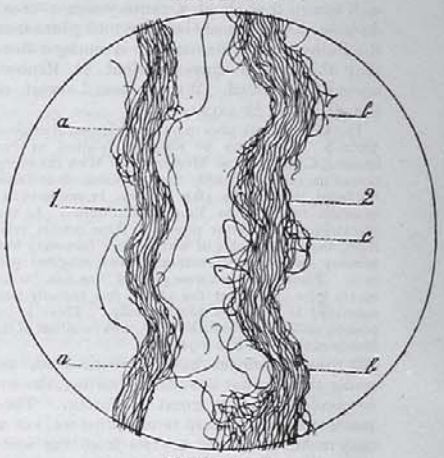


DIAGRAM 10.

come into relatively the same position, *a* being repeated twice to *c* once. This leads us at once to decide that the backing is tied to the face in 8-end sateen order, since, as shewn in *Design* 14, this sateen ties on every other twill. We need scarcely note that it is almost impossible to analyse these cloths successfully without a complete theoretical knowledge of the underlying principles and some practical experience; for, in addition to the foregoing difficulties, it is found in practice that at times the influence of tying is quite remarkable, a slight variation in the position materially influencing the result.

DOUBLE CLOTHS.

The principles governing the construction of these are very similar to those governing backed cloths, the only difference being that there is a distinct back cloth formed. The analyst should proceed as follows:—

(1) Find the face weave or design;

(2) Find the back weave or design;

(3) Find the relative qualities of face warp and weft to the backing warp and weft along with the counts of yarn; and

(4) Find the method of tying, whether with warp or weft, and the method of distribution.

With reference to this latter proceeding, *Diagram* 10 demonstrates a very useful point. Here 1 is a thread taken from the face of a cloth, made as follows:—

Warp.

2 threads 2/30's worsted; 1 thread 18 sk. woollen. 12's reed 6's.

Weft.

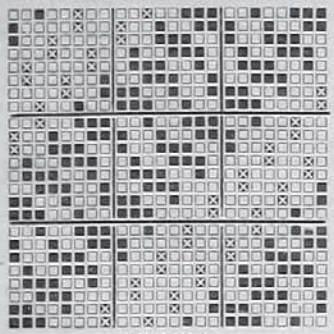
Same as warp; 72 picks per inch.

2 represents a thread taken from the plain back of 18 sk. woollen. It will at once be observed that, owing to the face being as fine again as the back cloth, the curves of the two-and-two twill coincide with the plain. Further, it is evident from an examination of the curve of the backing thread that the back cloth has

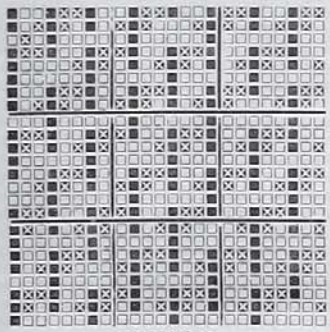
been tied to the face by means of the backing warp, *b* indicating this tie, which is a much more marked curve than is *c*, where no such tie has taken place. *Design* 15 is the plan employed.

COTTON DRESS GOODS DESIGNS.

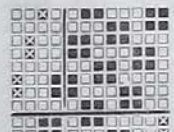
So much skill and care has been expended on designs and colourings, that the woven cotton material at a very short distance might be taken



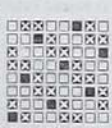
DESIGN 9.



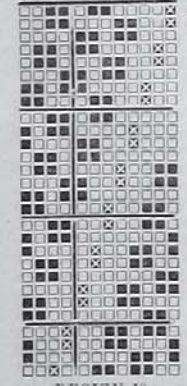
DESIGN 15.



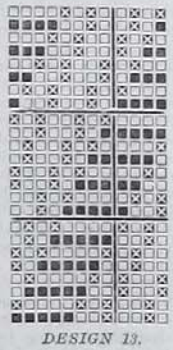
DESIGN 11.



DESIGN 12.



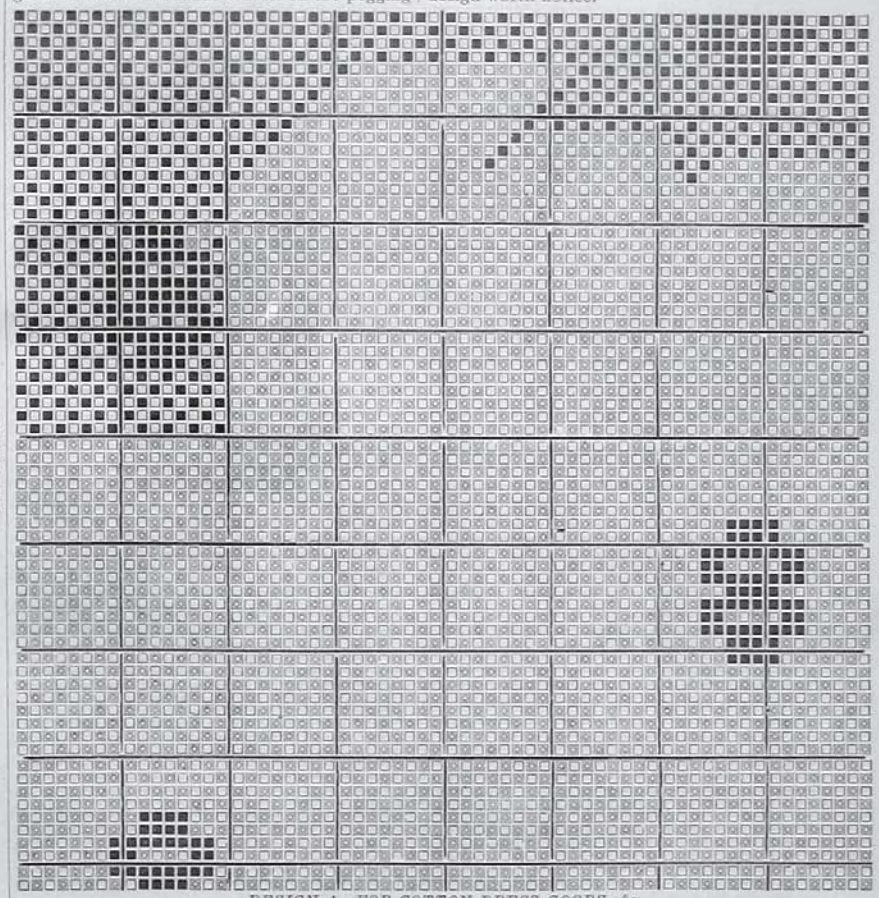
DESIGN 10.



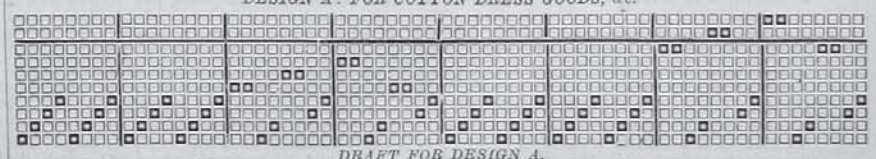
DESIGN 13.

for wool or satin, the goods so made hanging quite as easily and gracefully as if manufactured from silk fibres. The present year will shew some of the finest specimens of cotton goods ever exhibited, and that they will be fashionable goes without saying, seeing that they are being made up long in advance of the time when they can be worn. Ottomans, sateens, zephyrs, cambrics, ginghams, and beautiful muslins are the makes, ornamented with large or small, single or elaborate zigzags, small blocks, dots, ovals, leaflets, Maltese crosses, flowers, etc. In some few instances the pattern is of several shades upon a light ground; in others pattern and material are of the same colour. Canvas grounds are the latest, with a foundation or lining of silk, which glitters through the interstices or open spaces of the cotton fabric when made up either as a blouse, vesting, or skirting. That is truly a marvellous freak of fashion, causing the more costly material to play a subordinate part, but so it is, and manufacturers must bow to the fiat. In respect of colours as usual all the delicate embryo buds and spring blushes are sought for, but as is natural the early primrose and cowslip tints will lead, to be later on blended with pale or dark violet—one of the most tasteful arrangements that the eye can possibly dwell upon in feminine costumes whether made up of cotton or more expensive materials. Where cost is no object the most lovely of all dress goods are cambrics if of good design and dainty colourings, forming the prettiest of all spring dresses, being exquisitely fresh, giving grace and beauty in every undulation of the drapery.

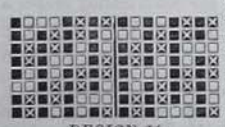
Design A is constructed for a fancy zephyr stripe, with a small warp spot for ornamentation (see draft and pegging plan). The distances between the figures may be increased or decreased by repeats of the draft and round; 40 dents per inch, two in a dent for plain ground; spotting 4 in a dent; ground warp 32's twist, spotting yarn two-fold 60's, very little twist if possible; weft 80 picks per inch of 30's soft spun. As a guide we have marked the shafts on the pegging plan in numerical order, so that the pattern now given may be drafted without any mistake: 22 light mauve, 22 white, weft all white, the figures to be only on alternate white stripes; 22 light mauve and 8 of white on the plain shafts 1, 2, 3, 4; then a double end in a heald of dark chocolate on 5th shaft; 2 of white ground on 1 and 2 shafts which makes the 4 in a dent; a double end in a heald of chocolate, on 6th shaft with 2 white on plain shafts; a double chocolate end on 7th shaft, and two white plain, and double chocolate end on 5th shaft with two white plain completes one figure. For the alternate stripe, 8 white, 22 light mauve, on the 1, 2, 3, 4, plain shafts; double end chocolate on 8th shaft; 2 white plain shafts; double end chocolate on 9th shaft; 2 white plain double end chocolate on 10th shaft; 2 white plain double end chocolate on 8th shaft; with 8 white on plain shafts, the repeat commencing with the first 22 of light mauve. These particulars carefully followed will give exactly the drafting of this pattern. Any other arrangement may be made—the chocolate changed to green, the size of pattern increased or the figures placed on each stripe if required; we have merely indicated what can be done, and consider the design worth notice.



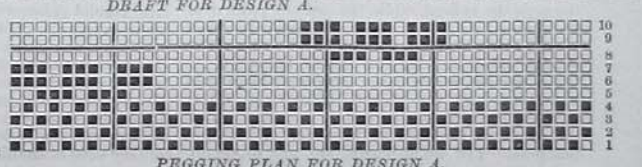
DESIGN A: FOR COTTON DRESS GOODS, &c.



DRAFT FOR DESIGN A.



DESIGN 14.



PEGGING PLAN FOR DESIGN A.