

## 4

# Figured Pique Fabrics

Figured pique fabrics, also known as fancy toilet cloths, belong to the same group of structures as welts and piques (see *Watson's Textile Design and Colour*). As in latter fabrics, a structural unit in figured piques consists of three ends, arranged: 1 ground, 1 stitching, 1 ground. The ground ends, which are comparatively slack, weave plain with ground weft and the figure is formed by the taut stitching ends, brought from a separate heavily tensioned beam, which by lifting over ground weft in selected places form indentations in the slack, plain weave ground cloth. The areas of the ground fabric which are not stitched down form prominent ridges or 'blisters' between the indentations due to excess length of the ground ends brought about by the light tension applied to the ground warp beam. Simple geometric figuring may be produced with the aid of dobby shedding motions but in most instances the designs are large and elaborate requiring the employment of a jacquard shedding system. A specially developed harness mounting with healds and working comber-boards on which these fabrics were at one time extensively produced is shown in Appendix I. Modern figured pique cloths are generally less stiff and 'boardy' than the traditional constructions which were almost exclusively made for bed covers, dress shirt fronts, etc.

A simple style in the figured pique structure is represented in *Figure 4.1* for which the condensed plan is given at A in *Figure 4.2*. Each mark of A indicates the lift of a taut stitching end over two face picks, by which the slack face cloth is drawn down and indentations formed in the surface; the blank diamond spaces between the marks correspond with the raised portions of the cloth. In weaving the design A in a dobby machine four healds would be employed for the plain face ends and nine healds for the stitching ends, as shown in the draft given at B in *Figure 4.2*.

### *Classification of the structures*

The cloths are classed as 2-pick, 3-pick, 4-pick, 5-pick, and 6-pick stitch according to the number of picks per stitch; and they are also described as 'loose-back' and 'fast-back' according to whether the stitching ends are floated loosely or are interwoven on the underside. The bulk of loose-back toilets are made on the

Figure 4.1

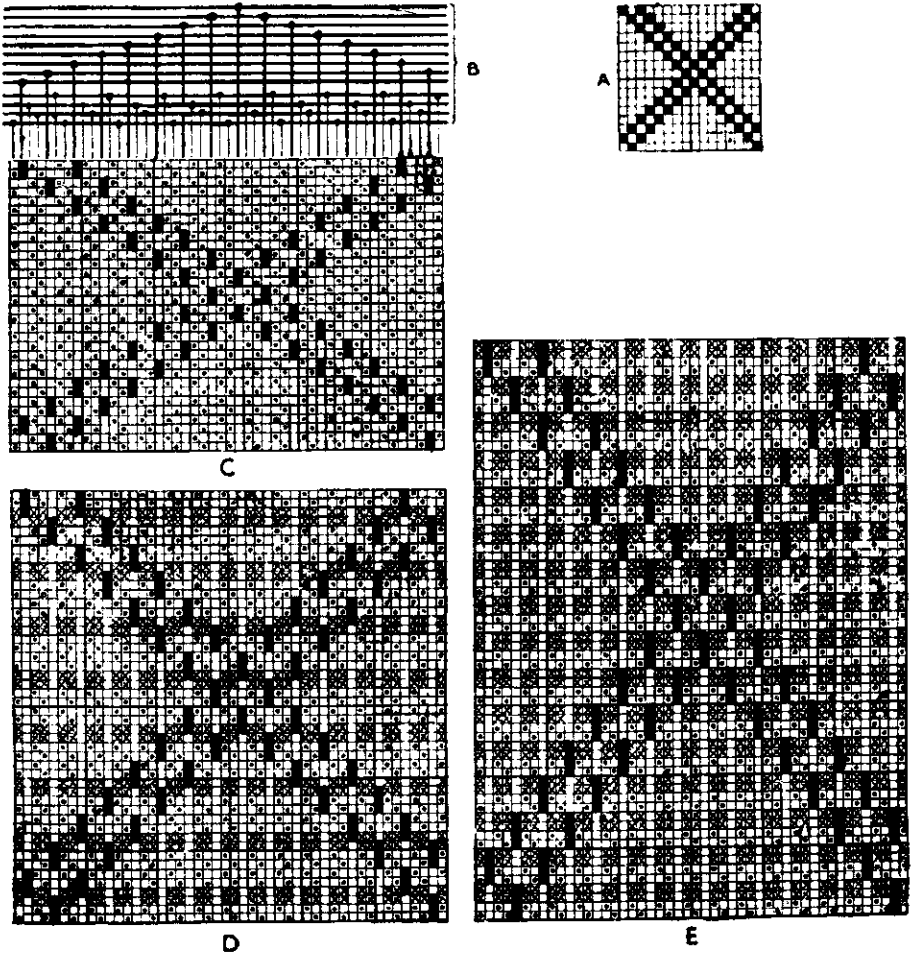
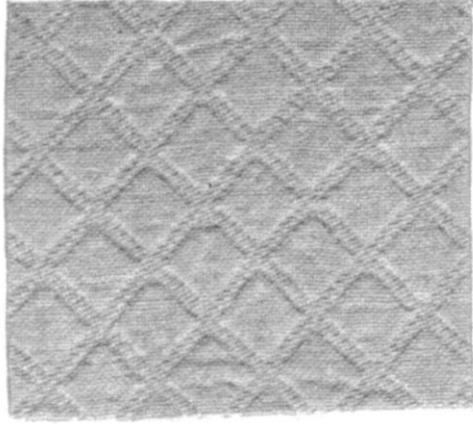


Figure 4.2

2-pick and 3-pick basis, whereas fast-back cloths are made four, five or six picks per stitch.

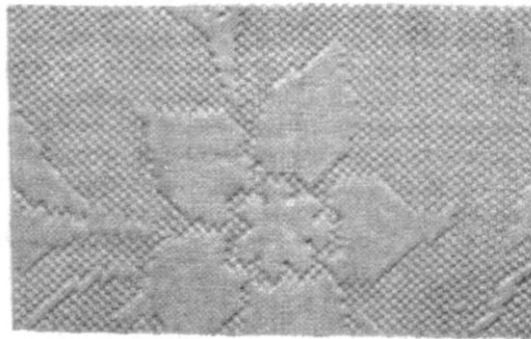
### *Loose-back piques*

In these the stitching ends are not interwoven below the slack plain ground cloth, and in *Figure 4.2* full weaves to correspond with the plan A are given at C, D, and E, which are arranged two, three, and four picks per stitch respectively. In C no wadding picks are inserted, and the stitching ends are up for two picks, forming the lifts shown in solid marks, while the ground ends are raised in alternate order so as to produce the plain weave, as represented by the dots.

In most of these cloths, however, wadding weft, which usually is soft spun and thicker than the ground weft, is introduced and it lies between the tight stitching ends and the unstitched portions of the ground fabric, thus giving greater prominence to the latter while making the cloth more substantial. In the 3-pick cloths the picks are usually arranged in the order of 4 ground to 2 wadding, as shown at D in *Figure 4.2*, in order that a loom with changing boxes at one end only may be used. In this case, the stitching ends are up for three picks at a time, whilst the ground ends weave plain with the ground picks as indicated by the dots, and are lifted over all the wadding picks, as indicated by the crosses in D and E. In a 4-pick structure the picks are arranged 2 ground and 2 wadding, as shown at E in *Figure 4.2*, and each stitching end is up for four picks at a time. The system of designing for elaborately figured loose-back piques, which is exactly the same as for fast-back cloths, is illustrated in *Figure 4.4*.

### *Half fast-back piques*

This class of structure (also termed 'stocking-back') comes between the loose-back and fast-back varieties. The stitching ends are interwoven in the plain order



*Figure 4.3*

with the wadding picks at rather infrequent intervals in order to avoid the formation of loose warp floats below the figure. In one order of lifting two plain sheds are formed by the stitching ends in every six groups of picks, and in another order in every four groups of picks. Thus E in *Figure 4.2* would be made half

fast-back in the first order of lifting by raising the even and then the odd stitching ends on picks 12 and 24 in every 24 picks, and in the second order of lifting, on picks 12 and 16 respectively in every 16 picks. In applying the first order of lifting to D in *Figure 4.2* the even and odd stitching ends would be respectively raised on picks 9 and 16 in every 18 picks.

### *Fast-back piques*

Fast-back pique fabrics are usually woven with four, five, or six picks to each stitch, the latter two constructions, however, due to high production cost, are now encountered rather infrequently. A portion of a figured pique fabric is shown in *Figure 4.3*, and a condensed design to correspond in *Figure 4.4*. In this structure the tight stitching ends are interwoven on the underside in plain order with alternate wadding picks, so that the two plain fabrics are formed—one above the other—in every part of the cloth. In the raised figure areas the two fabrics are quite separate from each other, and the inoperative wadding picks lie between them, but in the ground they are firmly united by the lifts of the stitching ends over the ground picks.

### *Method of designing*

In preparing a design the raised figure may be indicated by a wash of colour, in the manner represented by the shaded squares in *Figure 4.4*, and plain weave marks are inserted round the figure in order to separate it from the ground, the solid marks indicating the lifts of the stitching ends. The order in which the stitching ends are required to be interwoven with the ground weft is then indicated in the ground of the design, and various small weaves, such as those shown at G, H, and I in *Figure 4.4*, may be employed. In the example shown in *Figure 4.3* the ground texture is as firm as it is possible to make it, as the stitching ends are raised in alternate order. In condensed designing represented at F in *Figure 4.4* the alternate lifts of the stitching ends appear as plain weave markings and, therefore, only need to be indicated at the left of the design, as shown in *Figure 4.4*, on the understanding that the remainder of the ground area is exactly the same. The degree of condensation achieved in *Figure 4.4* is by 3 warp-wise, each vertical row representing one stitching end and two adjacent ground ends, and by 4, 5 or 6 weft-wise, each horizontal row representing four, five or six picks depending on the class of structure which it is intended to produce. In the cloth, each 2 × 2 area of figure and ground indicated at J in *Figure 4.5* is expanded as shown at K and L respectively, assuming that a 4-pick structure is produced.

It will be appreciated that the condensed design shown at F in *Figure 4.4* has been constructed so that the solid marks show exactly the places at which the stitching ends are floated on the surface of the ground cloth thus binding it in. The tight, alternate stitching shown at the edges of the shaded figure areas is necessary to achieve prominent puckering of the figure; whether it is also continued in the remaining ground areas is a matter of choice. In the example given it has been done, thus achieving the maximum prominence of the raised figure,

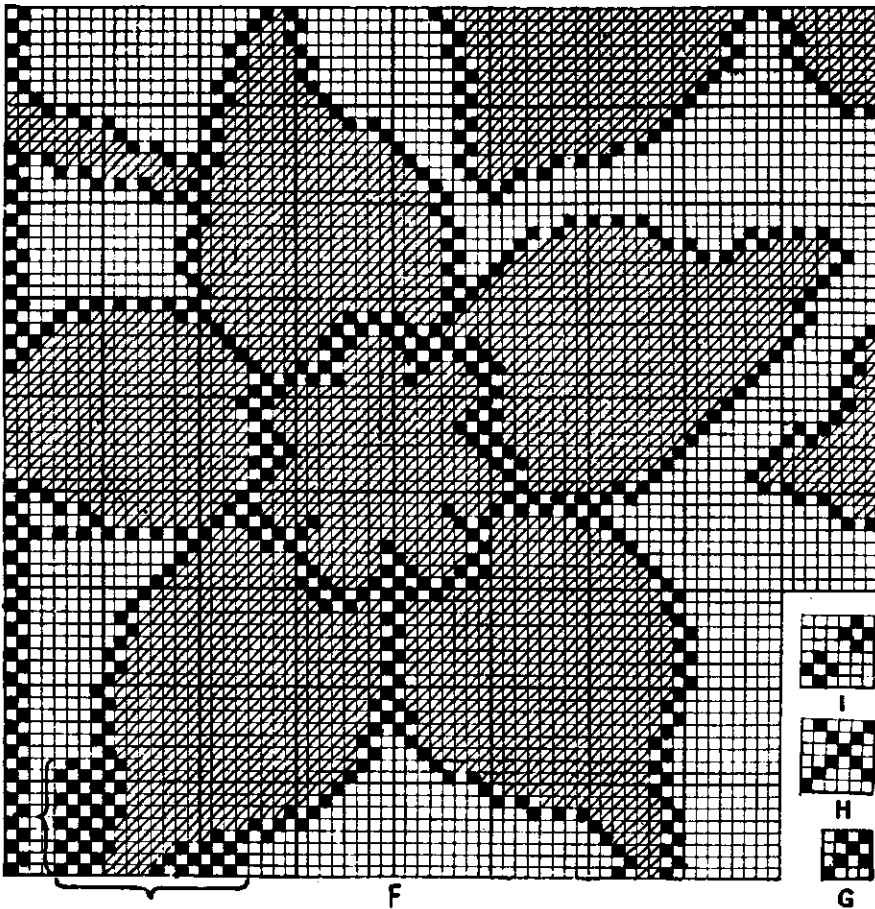


Figure 4.4

but if desired, any one of the motifs G, H, I in *Figure 4.4* could have been used instead to provide small, auxiliary corrugations or 'blisters' in the ground area. It will be noted that all the above motifs cut correctly with the alternate lifts of the stitching ends at the edge of the figure which is necessary to prevent the occurrence of disorderly long and short floats of the stitching ends on the surface.

In simplified designing for modern card-cutting systems the somewhat laborious build up of the structure indicated in *Figure 4.4* for the purpose of explaining the constructional features of these fabrics is unnecessary and where the ground area is the same only one colour of paint would be used to denote the figure as previously and the paper, or unpainted area, would then represent the ground. If the degree of condensation was the same as before then for a 4-pick structure each  $2 \times 2$  area of figure (i.e. paint) would be worked out as K, and of ground (i.e. paper) as L, in *Figure 4.5*. If the ground, apart from the tightly stitched surround to the figure, consisted of a different order of stitching such as G, H

or I in *Figure 4.4*, then the simplified design would be painted in two colours and paper. If the first colour represented the figure, and the second the alternately stitched surround then these would respectively correspond to the fully

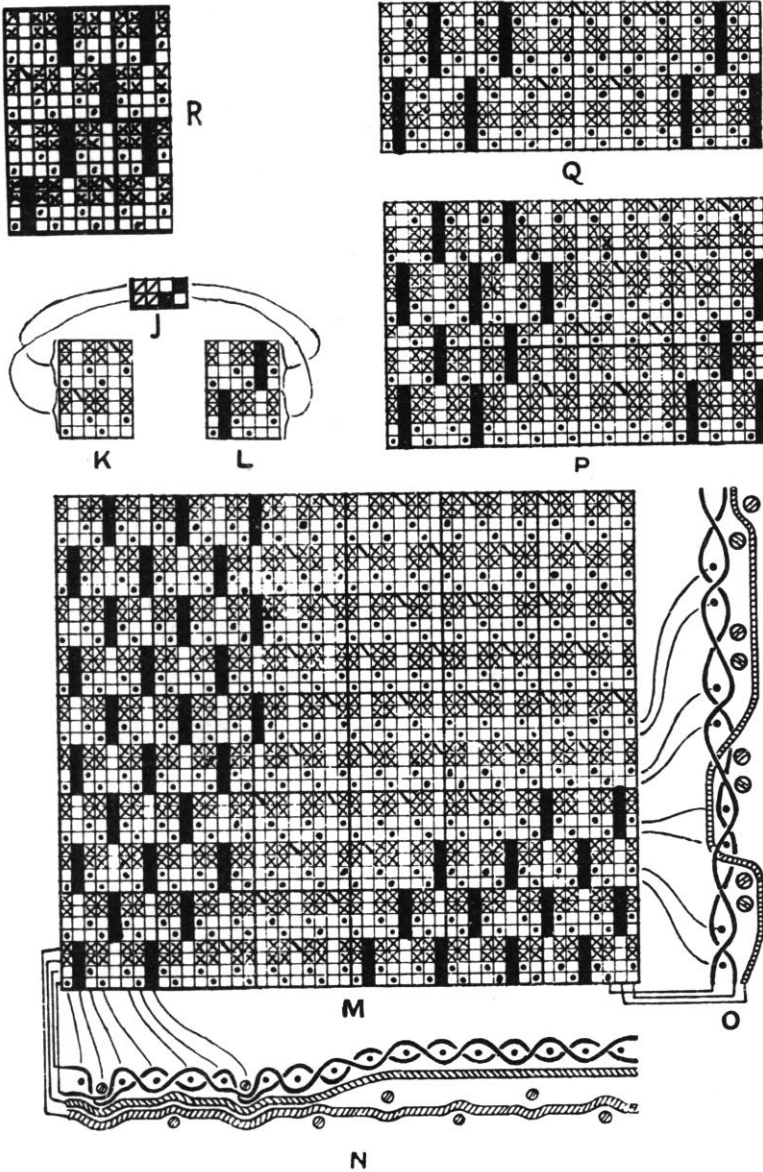


Figure 4.5

worked-out plans at K and L in *Figure 4.5* as before, but the paper would represent the new order of stitching in the ground and would have to be worked out in detail. This is shown at R in *Figure 4.5* which shows a fully worked-out

area equivalent to a 4 × 4 area of paper in the simplified design assuming that the motif G has been used for the ground.

#### *Four-pick structure*

As stated before, the plans K and L in *Figure 4.5*, each of which repeats upon six ends and eight picks, respectively show the weaves of the puckered and bound portions of a cloth which is woven with four picks per stitch. The warp is arranged the same as in all other pique structures, and the weft is inserted in the order of 2 fine ground picks and 2 thick picks. The raised area K is formed as follows: The ground ends are raised in alternate order on the two fine face picks, so as to form the plain ground or face cloth (represented by the dots), and all together on the thick picks (shown by the crosses). The stitching ends are raised in alternate order on the fourth and eighth picks (indicated by the diagonal strokes), the plain back weave thus being formed by the second of each pair of thick picks, known as the backing pick, while the first of each pair forms the wadding. In the bound weave L *Figure 4.5*, the order of lifting of the ground ends is the same as in K, but the stitching ends are raised in alternate order over a group of four picks at a place, as shown by the solid marks.

The complete weave, in the 4-pick structure, is given at M in *Figure 4.5* of the vertical rows 5 to 20, and the horizontal rows 1 to 10 which are enclosed by brackets at F in *Figure 4.4*. From a comparison of M in *Figure 4.5* with E in *Figure 4.2* it will be seen that the fast-back and loose-back structures are alike, except that in the embossed or puckered portions of the fast-back cloths the tight stitching ends are interwoven in plain order with the even thick picks.

The interweaving of the picks, 1, 2, 3, and 4 with the ends 1 to 24 of the design M, is represented at N in *Figure 4.5*, the bound structure being shown on the left, and the embossed effect on the right. O shows the interweaving of the three last ends of M with the picks 9 to 16, the embossed and bound structures being represented in the upper and lower portions respectively. The plain ground threads are shown in solid black, and the threads are connected by lines in order that the sectional drawings may be readily compared with the plan M.

The following are the weaving particulars of a typical bedcover cloth with four picks per stitch: Ground warp, 15/2 tex cotton; stitching warp, 24/2 tex cotton; ground weft, 20 tex cotton; wadding and backing weft 60 tex cotton; 43 ends and 57 picks per cm. The stitching ends contract from 5 to 8 per cent, and the ground ends from 15 to 20 per cent, while the shrinkage in width is about 12 per cent. Since each vertical space of the design paper is equivalent to three ends, and each horizontal space to four picks, the count of the design paper is in the ratio of  $(108 \div 3)$  to  $(144 \div 4)$ —or 8 × 8. Other cloths are frequently made with single yarns, and the ground threads range from 15 to 28 tex, the stitching warp from 25 to 34 tex, and the wadding weft from 30 to 72 tex; the ends and picks per cm in the plain ground cloth vary from 20 to 32.

#### *Five-pick and six-pick structures*

The structure of a 5-pick cloth is illustrated at P in *Figure 4.5*, which corresponds with the picks 1 to 16 and the ends 1 to 32 of M. In this structure in each

series of 10 picks the fifth and tenth form the backing picks, and these, in looms with boxes at one side only, consist of the same kind of weft as the face picks, so that the complete order of wefting is 2 picks fine, 2 picks thick wadding, 2 picks fine, 2 picks thick wadding, and 2 picks fine. Each stitching lift operates for five picks; the ground ends are operated in alternate order on picks 1, 2, 6, and 9, and then are raised together on picks 3, 4, 5, 7, 8, and 10; for the purpose of interlacing on the back, the stitching ends are raised alternately on picks 5 and 10. To correspond with the foregoing particulars of a 4-pick cloth the structure represented at P would be woven with about 75 picks per cm, of which 30 fine picks would form the face, 15 fine picks the back, and 30 thick picks the wadding.

Six-pick cloths are constructed as shown at Q in *Figure 4.5* which correspond with the picks 1 to 8, and the ends 1 to 32 of M. In this case also the face and backing picks are alike, and each group of six picks is arranged 2 picks fine, 2 picks thick wadding, and 2 picks fine, the last pick being a backing pick. There are three face (or ground) picks per stitch compared with two face picks in the 5-pick cloth.

The system of designing, illustrated in *Figure 4.4* is applicable for both the structures P and Q if each horizontal row is taken to represent respectively five and six picks.