

Methods of Enlarging Jacquard Designs

By A. E. MCKENNA, B. S.

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Jacquard patterns are usually prepared with dimensions similar to the woven sample in order to obtain some idea of the general appearance of the cloth when woven. Frequently, however, patterns are sketched in some convenient size in which the detail can be easily inserted. This, of course, makes it possible to obtain a more accurate transference to design paper. In any case, however, the sketch is always smaller than the pattern will be on design paper thus necessitating some method of enlargement. This is also true in the case of a design in a woven sample which is to be reproduced.

Transferring From a Squared Sketch

The coördinate method of transferring jacquard patterns to design paper may be used when more modern equipment is not available. In illustrating this method, it is assumed that a 600 hook, 12 row jacquard machine is being used with the harness tied up to give an 80 sley cloth. This means that there will be $600 \div 12 = 50$ hooks in the long row. It is considered that all of the hooks in the machine are being used for one repeat of the pattern. The design is to occupy a width of 7.5 inches in the cloth. The sketch Fig. (1)

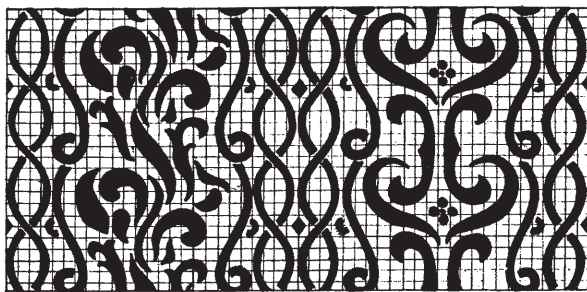


Fig. 1. Sketch Design

is shown which has been drawn in exactly the same dimensions as woven in the cloth. As 600 hooks are being used with 12 harnesses in the short row and the cloth is to be woven square 80x80, then a design paper with 12x12 small blocks in a large square will be used to correspond with the short row of hooks in the jacquard. The square of 12 blocks vertically on the design paper is used to correspond with the ratio of ends to picks per inch. To illustrate other proportions, if the construction of the cloth had been 80 ends and

40 picks to the inch, then a design paper having 12 blocks horizontally and 6 blocks vertically in a large square would have been used. Other counts of design paper may be used correspondingly.

The pattern Fig. (1), must contain 600 ends and 300 picks according to its size 7.5x3.75 inches. Thus the sketch will be divided horizontally to correspond to the long row of hooks into 50 divisions while the sketch will be divided vertically to correspond to the number of squares giving the necessary picks on the design paper to complete the pattern or $300 \div 12 = 25$ divisions. There are several methods of dividing a sketch into divisions. Fig. (2) shows one arrangement in which a

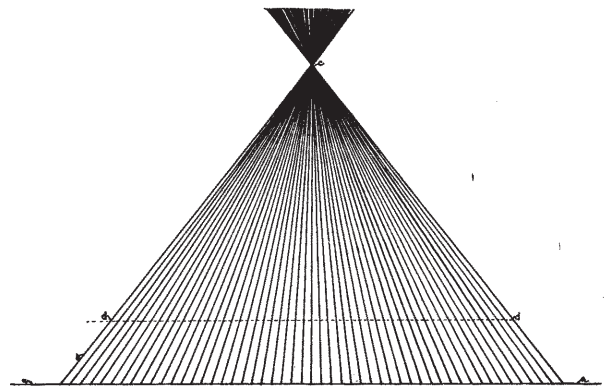


Fig. 2. Diagram of Sketch Division Arrangement

convenient length line (a) is drawn which may be measured off according to the number of parts desired. Lines (b) from these divisions are then drawn to a midpoint (c). This plan may then be cut or folded at any point (d) to correspond with the width or length of the sketch for division. Fig. (3) illustrates another method which is described by William Watson in his book "Color and Design." In this arrangement, the width or length of the sketch is measured off on the strip of paper (a). The number of squares corresponding to the divisions desired are counted off on the design paper as shown between the letters (b). The strip of paper is moved up at an angle until the width marked off on it just takes up the space occupied by the blocks. The divisions spaces may then be marked off as indicated by the squares and the strip is ready for use on the sketch.

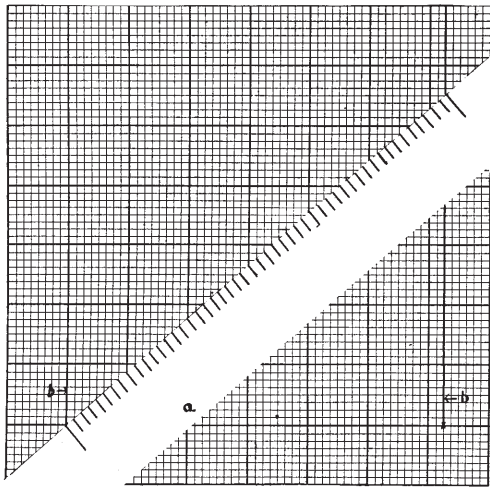


Fig. 3. Diagram of Sketch Division Arrangement

The cloth is to be woven on 600 ends and 300 picks, and therefore the design paper will be marked off to include this number of small blocks or 50 large squares horizontally and 25 squares vertically to correspond to the sketch. The pattern is transferred from the sketch to the design paper by copying the crossing of the figures over the squares in the sketch in exactly the same manner over the large squares of the design paper. Fig. (4) illustrates the steps taken in building up this pattern on design paper for card cutting. This illustration shows only a portion of the design. Space (a) shows the outlined figure as transferred from the sketch. Space (b) shows the method of blocking-in the outline of the figure to correspond to the squares of the point paper. Space (c) represents the painting-in of a 10 harness weave on part of the figure. Space (d) shows the painting-in of the ground weave around the figures. When closely interlaced weaves such as plain or small ribs are used for the ground it is usually better to insert the ground weave first around the sketched-in figure in order to obtain a clearly defined pattern. Fig. (5) illustrates a sample of the cloth woven according to the pattern shown in Fig. (1) and (4).

Enlargement From Woven Samples

The procedure just described may be carried out in a similar manner when designs in woven samples are to be reproduced. The sketch may be traced from the cloth by placing a transparent sheet of celluloid over the sample and tracing the design on this sheet with a pen and india ink. A piece of tracing paper may then

be clipped over the celluloid sheet and the design re-traced for transference to a heavier grade of paper. A piece of white paper placed under the sheet of celluloid will help considerably in distinguishing the outlines of the figures in the design. Celluloid sheets suitable for this work may be obtained from stores selling automobile supplies. It is not necessary to make a sketch of the design unless there is some change to be made in the ornamentation. The enlargement may be made directly from the sample by placing a sheet of transparent celluloid over one repeat of the pattern. This sheet may be squared off in any dimensions desired with a ruling pen and india ink according to the number of large squares on the design paper to be used. One sheet of celluloid may be used for a number of designs as the lines may be erased by washing in soap and water.

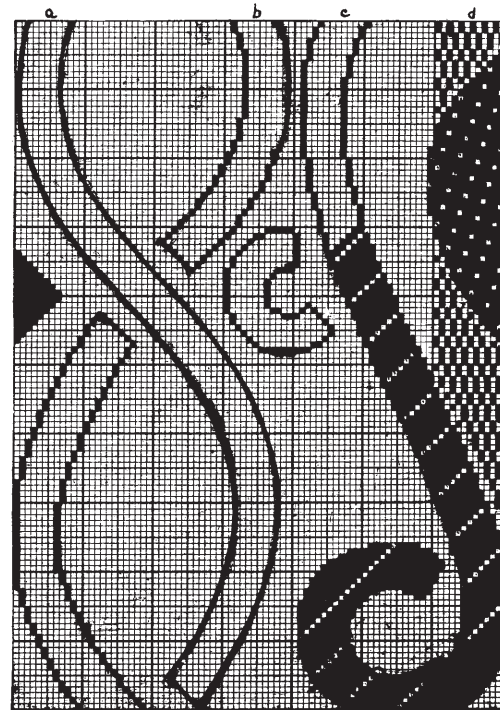


Fig. 4. Point Paper Design for Fig. 1

The Use of the Pantograph

Fig. (6) illustrates a pantograph which may be used for enlarging patterns to design paper. Point (a) is fixed to a table. Point (c) is provided with a tracing point for following the outline of the sketch. Point (f) is provided with a pencil which rests on the design

paper and is used for making the enlarged tracing. Any movement of the tracing point (c) causes a greater

order that a sharp image may be obtained for tracing purposes, some provision should be made for darkening



Fig. 5. Drapery Fabric Woven According to Fig. 4.

movement of the pencil point (f). The degree of enlargement depends upon the ratio of the length of the arms (bc) and (df). The arms (bd) and (ce) are set parallel for all enlargements. The instrument shown in Fig. (6) is not very accurate, being built of wood, and the only adjustments that can be made are through the use of the holes shown at (h). Metal instruments are available which may be used for enlarging in all proportions from 1/20 to 4/5. These pantographs are equipped with sliding adjustments and are very accurate.

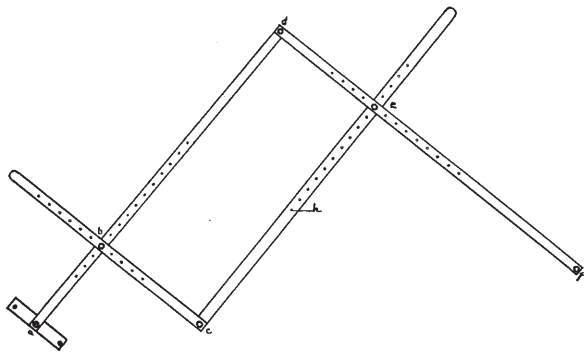


Fig. 6. Pantograph

The Use of Projecting Apparatus

Practically any type of projection equipment may be used for enlarging jacquard designs on point paper. If available, such equipment as manufactured by the Bausch and Lomb, Saentis, Inc., Spencer Lens Company, and other firms may be used to a good advantage. In

a room. In place of the usual screen, a large sheet of beaver board may be mounted on one side of the room upon which the design paper is to be attached. The projecting lantern may be mounted on a small table which can be easily moved to obtain the required size of image on the point paper.

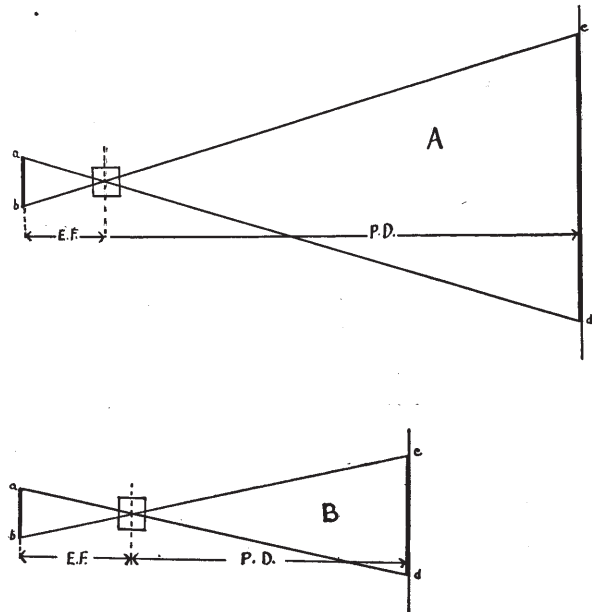


Fig. 7. Diagrams of Projecting Distance and Equivalent Foca Length Relationships

To make an enlarged copy of the sketch, it is first necessary to mark off on the design paper the number of squares representing the ends that are to be used for one repeat of the pattern. With the room darkened



Fig. 8. Picture to be Woven in Cloth

and the sketch in the machine, the lantern may be moved a distance from the design paper which will place the image within the limits that have been laid out. The enlarged design may then be traced on the point paper in pen or pencil. Any shadows in the sketch which may be desired in the cloth may be outlined, thus providing limits for the required shading weave which is to be applied later. After the design, paper tracing has been made, the blocking-out and painting-in operations may be carried out as described previously. This means of transferring sketches to design paper has the advantages over the other methods previously described of being more easily carried out and requiring less time for completion.

Fig. (7) A and B illustrate the relation between the projection distance (P.D.), the equivalent focal length (E.F.), and the size of the image. Note that if a small image is desired, the projection distance is shortened while the equivalent focal length is in-



Fig. 9. Point Paper Design for Fig. 8



Fig. 10. Picture Woven According to Fig. 9

creased. The line (ab) represents the design in the lantern and the line (cd) represents the image on the point paper.

This type of apparatus presents a reversed image. No difficulty will be experienced with symmetrical and bi-symmetrical designs or with patterns in which the position of the figures makes no particular difference. However, in case non-symmetrical designs are to be

paper for tracing. Fig. (9) shows the point paper design and Fig. (10) illustrates the picture produced in cloth. Designs in cloth samples may be reproduced as well as sketch designs with this type of projecting apparatus.

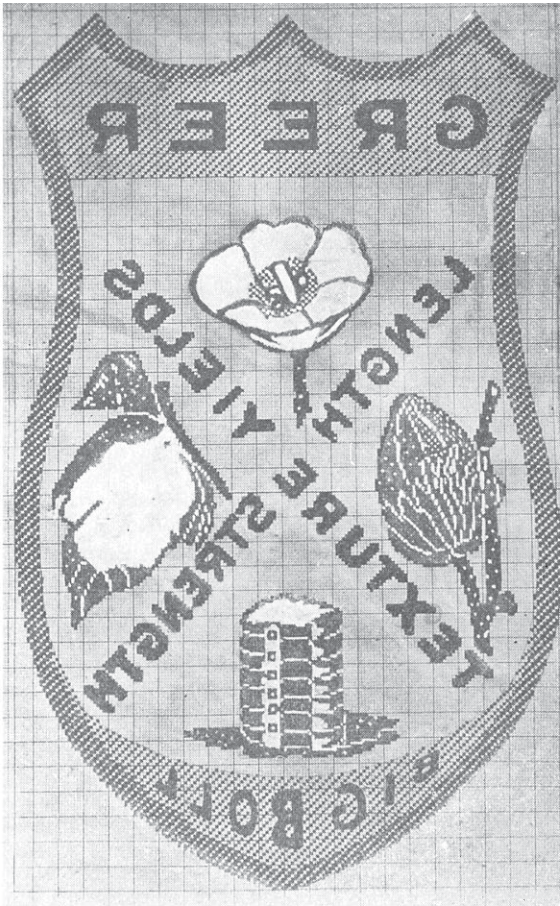


Fig. 11. Point Paper Design for Fig. 12



Fig. 12. Ribbon Pattern

enlarged exactly according to the sketch, some additional means must be used to obtain the reproduction. This result may be accomplished with the use of a mirror placed in front of the lantern lens in such a way that the image may be reflected to the point paper. The image will be formed on the design paper at right angles to the direction in which the lens is pointed. Fig. (8) is a photograph which was used as a pattern to be woven in cloth. A mirror was used with the apparatus to obtain the exact image on the design

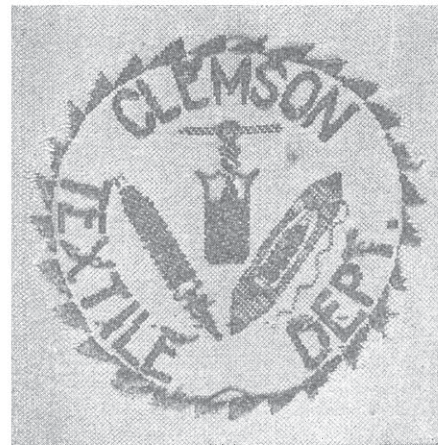


Fig. 13. Ribbon Pattern

The Use of Projecting Apparatus for Ribbon Designs

Jacquard designs in ribbons and labels are usually woven face down on the loom in order to reduce the

as before, the design appearing as if one were looking at the reverse side of the woven sample. Fig. (11) illus-

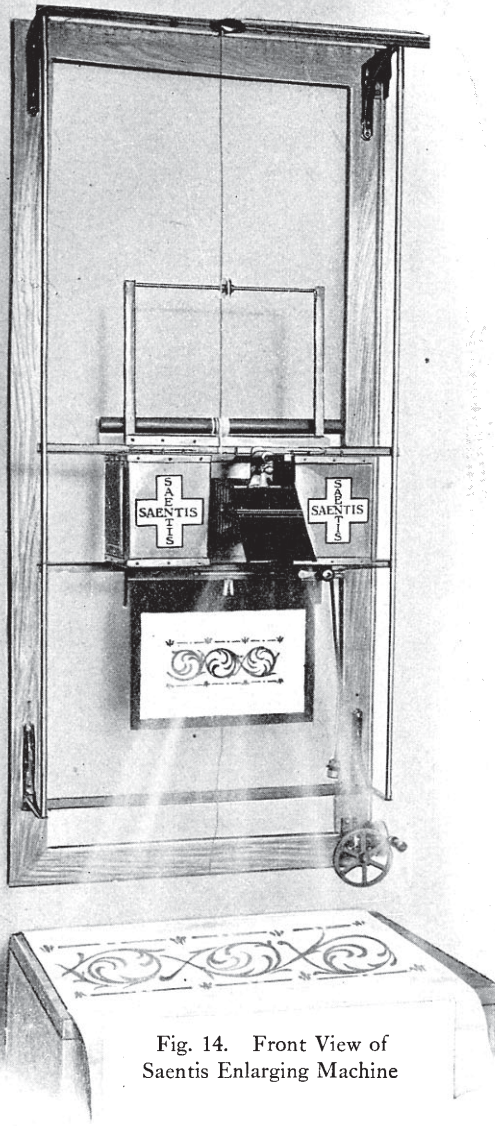


Fig. 14. Front View of Saentis Enlarging Machine

lifting strain on the jacquard machine. In many patterns, there are places where only a small amount of figure filling is woven into the cloth. Thus it can be readily observed that under such conditions, it is much better to weave the cloth face down and allow the filling to float above the warp. Provision may be made for weaving the design in this manner by reversing the pattern on the point paper with the use of a projecting lantern. The reversed image on the point paper is obtained by changing the position of the design in the lantern. The tracing of the image may then be made

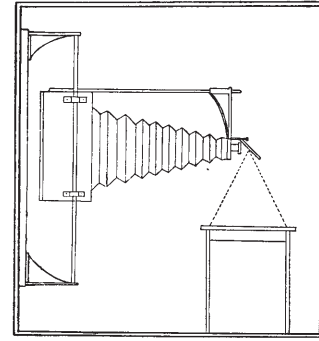


Fig. 15. Side View of Saentis Enlarging Machine

trates a point paper design as traced by this method. Fig. (12) shows a sample of the ribbon woven in this pattern with two colors of filling. Fig. (13) shows another ribbon that was woven in a similar manner. Another method used for weaving the cloth face down is to sketch the design face up on the point paper and provide for the reversed weaving by cutting and lacing the cards from the top pick down.

The Use of the Enlarging Machine

An enlarging apparatus which has been designed especially for producing enlarged reproductions of designs of all types has been found very useful for jacquard designing. This machine is easier to operate for this work than the regular projecting apparatus described previously. It is mounted on a vertical stand and may be raised or lowered to obtain the desired size of image by a system of pulleys and a crank. There are two other setting points; namely, a long range focusing attachment and a horizontal adjustment for the sketch design. Thus considerable time and labor is saved in setting the image within the allotted space on the point paper. Another feature is that of being mounted vertical, the image is projected downward on design paper placed on a table. The pattern may be traced more easily than in the case in which the image is projected on a vertical screen by the ordinary projecting lantern. A mirror mounted on the lens provides for the exact duplication of the design on the point paper thus making it possible to trace the pattern on the design paper as it appears on the original sketch. Designs in cloth samples may be reproduced as well as line sketches. Fig. (14) and (15) illustrate an enlarging machine of this type which is manufactured by Saentis, Inc., of Union City, N. J.