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A STUDY IN THE DESIGNING OF COTTON, SILK, AND WORSTED, FIGURED DRESS GOODS.

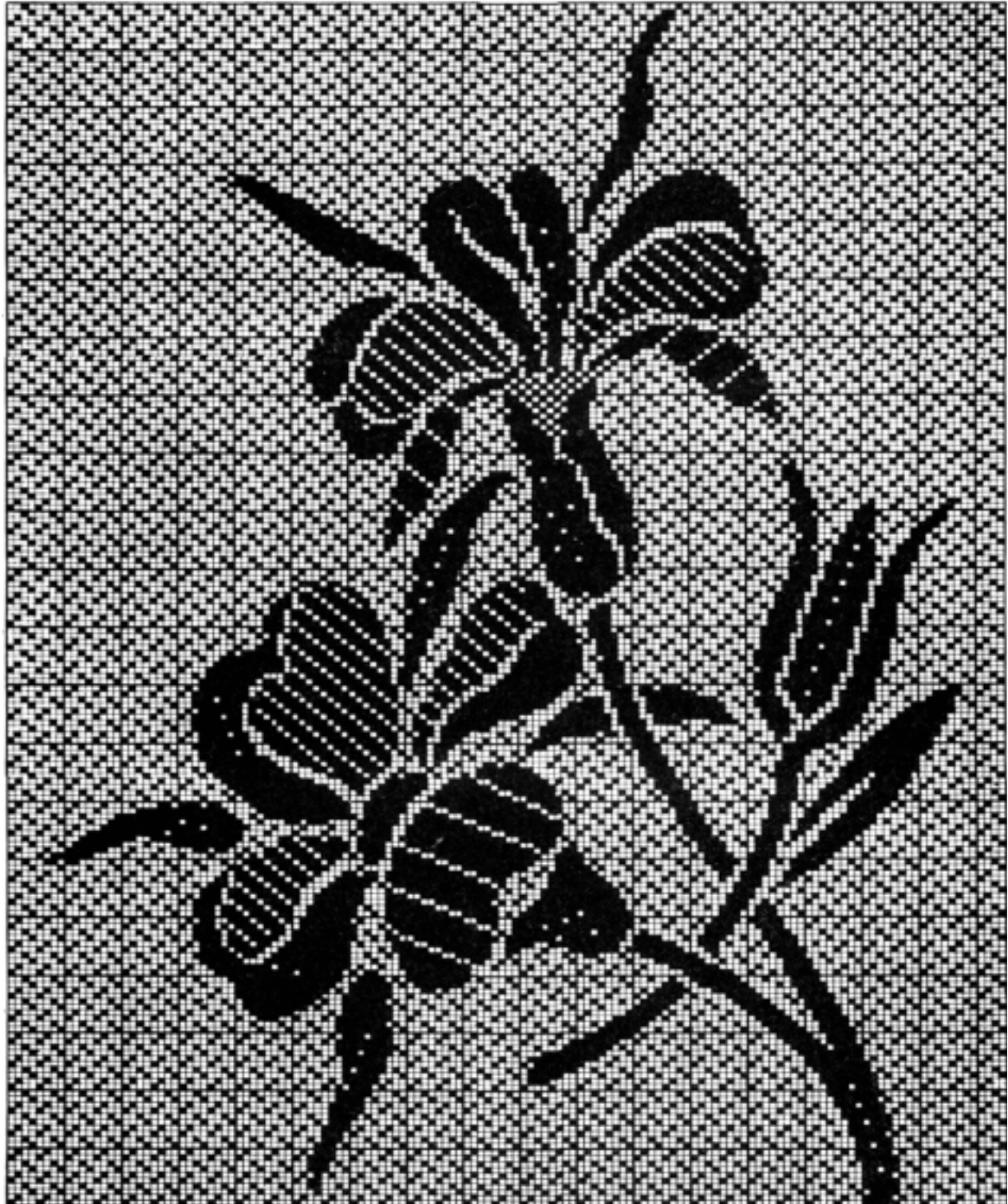


FIG. 1.

Dress goods considered from a technical point of view generally refer to what is known as single cloth structures, and which construction of figured, *i. e.*, Jacquard dress goods we will take up for our present

subject, covering with details given, Cotton, Silk, Worsted, Mohair, and Union structures, in all their varieties, as any textile manufacturer may come in contact with. The only difference which will present itself will be a change in the nature of the subject, size of design, and texture of fabric structure, to suit the commercial demand; with its consequent change in size of sketch and working design on the point paper, as well as kind of point paper required to suit the fabric structure to be made.

By single cloth structures are understood fabrics requiring only one system of warp and one system of filling for their construction. Other constructions of Jacquard fabrics will be dealt with, one in each successive issue of the journal.

Texture. Previously to planning design on our point paper, the first thing we have to do, is to take the texture of the fabric to be made into consideration, whether it refers to an original idea or a duplicate.

For Example, let us consider fabric texture required to be 90 x 112, by which is meant a fabric having 90 warp threads and 112 picks per inch, in its finished state.

To ascertain kind of point paper to use. *Rule:*—Warp texture in finished fabric (90 in our example) : Filling texture in finished fabric (112 in our example) :: Point paper to be squared for warp : point paper to be squared for filling.

We now have to find the ratio for the point paper to use, with reference to our example, more particularly the first term of said ratio, *i. e.*, the ruling of the point paper for the warp, since the same is subject to the rows of needles used in the Jacquard machine, in order to facilitate over-ruling of the design for the purpose of card stamping. The most frequently used arrangement of rows of needles of Jacquard machines used for this class of fabrics is 8, 12 and 16 rows, the first (8), being the one we will take into consideration with our example, for the reason that as will be seen later on, we will use a 400, *i. e.*, an 8 row deep Jacquard machine, for design illustrating this article, hence proportion previously given as a rule for ascertaining point paper reads thus:

$$90 : 112 :: 8 : x, \text{ and}$$

$$112 \times 8 = 896 \div 90 = 9.955 \text{ or practically } 10,$$

hence 8 x 10 is the point paper to use.

A good plan when thus laying out calculations for the point paper to use, is to keep at the same time the repeat of the weave to be used in the design for ground work (provided the same, as is generally the case, repeats all over) under consideration, for the reason that the work of the designer will be greatly simplified, provided the ruling of the point paper covers one repeat, or a multiple of the repeat of said ground weave; or if this is not possible, see if one or two heavy squares do not call for one or more complete repeats of said ground weave. By this we mean that

if, for example, the over-ruling of the point paper used—warp ways—is done in 8's, then 4, 8, 12, 16, 20, 24, etc., will be suitable repeats for ground weaves, since

$$2 \text{ repeats of a 4-harness weave} = 1 \text{ square}$$

$$1 \text{ repeat of a 8-harness weave} = 1 \text{ square}$$

$$2 \text{ repeats of a 12-harness weave} = 3 \text{ squares}$$

$$2 \text{ repeats of a 16-harness weave} = 4 \text{ squares, etc.}$$

In the same manner, provided the Jacquard machine to be used should be a 12 row Jacquard machine, *i. e.*, a 600, 900 or 1200 machine, then 4, 6, 12, 8, 9, 18, etc., would have been suitable repeats for ground weaves to use. In the same manner proceed, provided a "fine index," *i. e.*, a 16 row Jacquard machine is used.

Fabric sketch. This is the next item to be considered by us, the same referring either to an original design or a copy, and for which the Jacquard machine at our disposal, as well as the commercial demand of fashion and cost of cloth regulates size and character. Suppose (as mentioned previously) it is a 400 Jacquard machine we have at our disposal, tied up straight-through, using 50 rows @ 8 row deep of the machine, for fabric; the remaining 2 extra rows of the machine over the 400 (every Jacquard machine is built with two extra rows, and which may be used or not) being used for selvage, or one row for selvage, one row missed—hooks taken out, so no hitch or smash up in the loom during the weaving, caused by the idle hooks getting caught in the machine, is possible.

This in turn will give us

$$400 \text{ (needles of Jacquard machine used)} \div 90 \text{ (warp texture, finished)} = 4.45 \text{ inches as the width of one repeat in finished fabric.}$$

It will be readily understood that in the loom, in connection with the reeding of the warp as well as the planning of the comberboard, a slightly lower warp texture has to be used, to compensate for the difference in texture of warp in reed to that in the finished fabric, technically known as the take-up of the fabric on the loom, the difference depending on the character of the fabric, *i. e.*, kind of material used, counts and twist of yarn, as well as weaves used for ground and figure. To explain the subject from a practical point, suppose our example refers to a low textured silk fabric, or a mercerized cotton warp with regular cotton yarn as filling, or the reverse selection, or the use of a cotton warp in connection with a waste silk or a worsted filling, or a worsted structure all around, etc., and when then, using a reed #42 @ 2 ends, will give us 4.76" for the repeat of the design in the reed, as well as for tie-up of the harness in the comberboard. In connection with a worsted warp, it will be advisable, in place of a #42 reed, to use a #28 reed @ 3 ends, again it then may be found advisable to slightly lay fabric somewhat wider in

comberboard and reed—say for example a #27 reed @ 3 ends.

We will now turn back to our finished fabric structure and design to be made for it, *i. e.*,

400 needles ÷ 90 warp threads = 4.45 inches and which can be covered either by 1, 2, 3 (if dropping ends) 4, 5 or more repeats of a design, and when

using 1 repeat = 400 warp threads at our disposal,

“ 2 repeats = 200 warp threads at our disposal,

“ 4 repeats = 100 warp threads at our disposal,

“ 5 repeats = 80 warp threads at our disposal.

For our example we selected one repeat, and in turn produced the fabric sketch herewith shown, one

Length of repeat of finished fabric sketch Fig. 1, is $5\frac{1}{4}$ inches, which if multiplied by 112 (picks per inch in finished fabric) equals 644 picks for the repeat of the design on point paper; 644 being evenly divisible by 4—the repeat of the ground weave.

Point paper design. We thus have to use for the complete design on the point paper, in connection with using an 8 × 10 point paper

400 ÷ 8 = 50 heavy squares for warp, and

644 ÷ 10 = 64 heavy squares + 4 lines, for filling.

To illustrate the execution of the complete Jacquard design on point paper to the reader—as will be readily understood, would require such an immense



FIG. 2.

repeat 4.45 inches wide—actual size of design in fabric—being given.

To ascertain repeat of design on point paper, filling ways, from sketch and texture given. *Rule:* Multiply length of fabric sketch with picks per inch in finished fabric, being careful to remember that product obtained must be evenly divisible by the repeat of the ground weave, which in our example will be the 4-harness broken twill.

reduction of said design, that the same would become useless, considered from a practical as well as educational point of view; for which reason, we will only show a portion of it, the same, however, to cover one of the main figures used in the design, complete, and consequently fully explaining the procedure.

For Example: Square *a, b, c, d*, on fabric sketch is the portion of the design we now want to show up, practically executed on point paper.

