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Posselt's Textile Journal

A Monthly Journal of the Textile Industries

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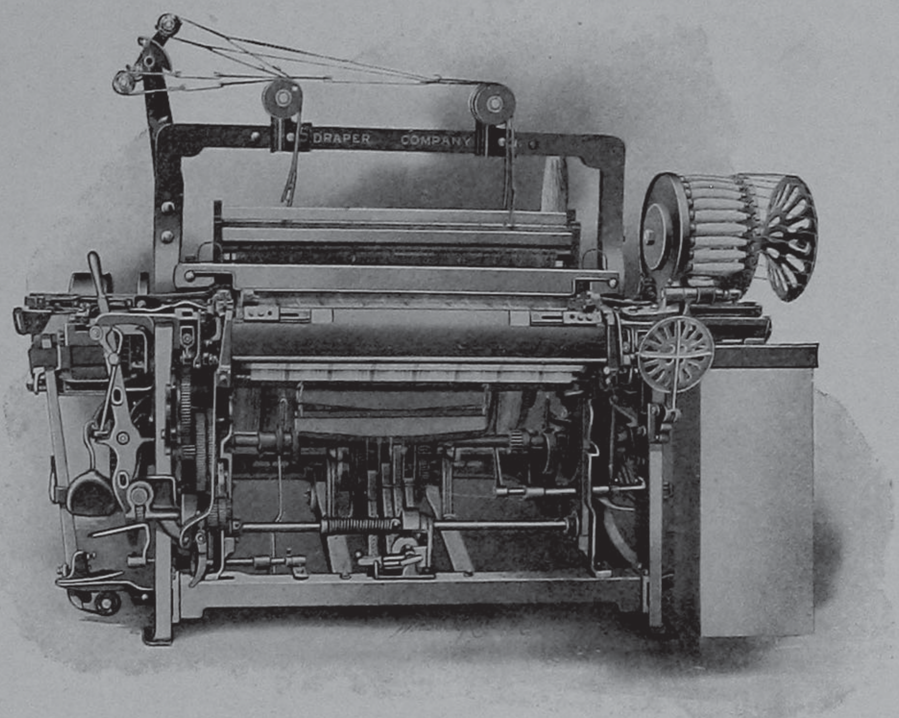
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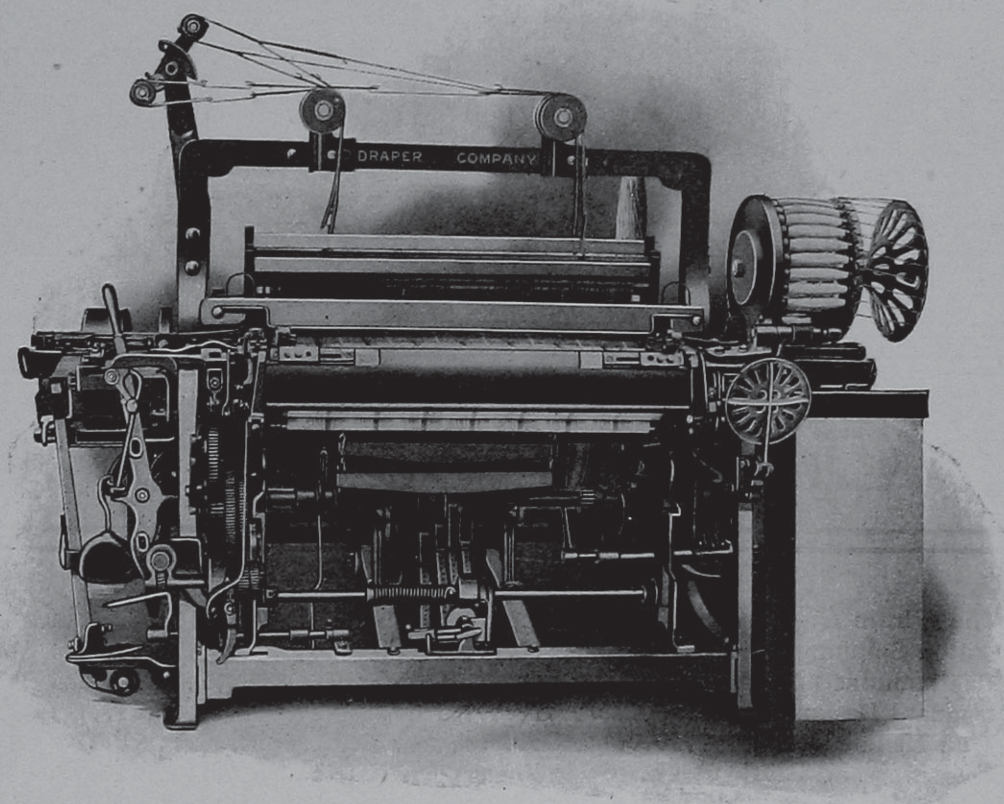

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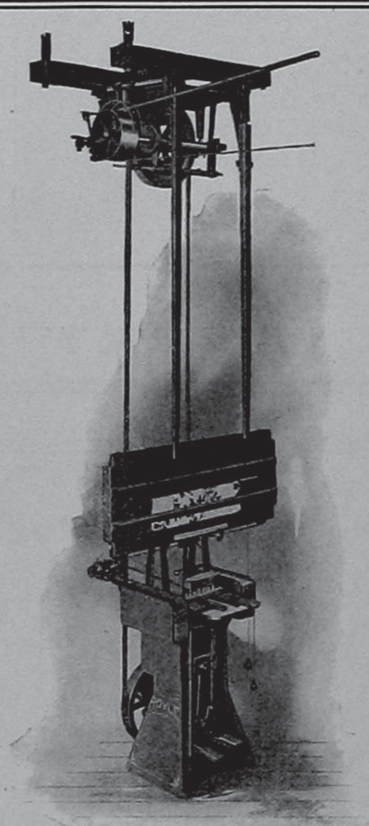

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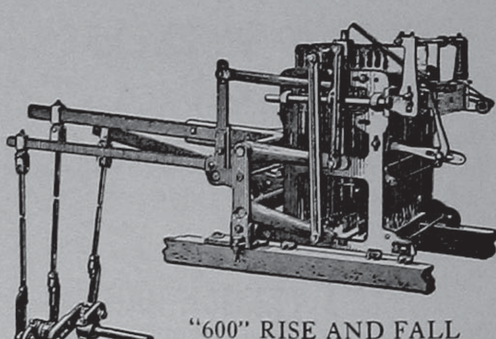

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in the finished fabric between starting the fulling in a greasy condition or when this grease has been loosened, this being the reason why very delicate fabrics are first washed before brought to the fulling mill. Heavy goods and fabrics constructed with an extra high, heavy texture, and such as carry in their body a considerable amount of grease and dirt, will frequently be found to full with difficulty, for which reason, it is well to also wash such fabrics previous to fulling. This washing does not necessarily have to be as thorough as that which succeeds the fulling, however, it has to be sufficiently vigorous to loosen up the foreign materials in the fabric, and give the fibres an opportunity to come in contact with the soap during fulling, and thus to get all the benefit which is to be derived from moisture, heat and friction.

It might be thought that washing the goods before fulling, would make the latter operation, so far as time is concerned, shorter, but this is not so, however, the distinct advantage comes in the appearance of the finished goods, together with their handle or feel, and brighter colors obtained, all of which should repay the extra expense of a first washing of such fabrics. This previous washing will also aid when dealing with fabrics in the construction of which low grades of carbonized wools have been employed, and when there is a considerable difference in the amount of time required for fulling these goods when they are washed previously, and when they are not. If they have been thoroughly washed for three or four hours with a

(*Continued on page x.*)

Posselt's Textile Journal

Vol. III. August, 1908. No. 2.

THE WHITIN HIGH SPEED COMBER
and its Preparatory Machinery.

(*Continued from Page 26.*)

The Whitin High Speed Comber. Previous to going into the details of the construction and operation of this masterpiece of textile machinery, it will be of interest to first give a few points of general data, based upon facts furnished by Mr. Elwin Holbrook Rooney, of Whitinsville, a recognized authority on Combing Cotton, here and abroad, and one of the inventors who has brought this comb to its standard efficiency.

This high speed comber is identically a Heilmann comber, as used here and abroad, since the last half century and consequently has stood the test of time. The high speed comber in itself is the outcome of practical experience in the process of combing, combined with the mechanical ingenuity required to bring up the original English machine as imported up to 1897 to the acme of perfection, with reference to quality and quantity of work produced, besides simplifying the general construction of the working parts of the machine. No combers were built up to 1897 in this country and it was then that the Whitin Machine Works, on account of the immense demand for combed yarn here, undertook the manufacture of this machinery, the first American built comber being put by this concern on the market in 1899. The success and appreciation with which this machine was at once received by cotton spinners, induced the builder to bestow special attention to it, discover its weak points, eradicate them and substitute in its place improvements, which now have resulted in a machine which is not only built here, but also duplicated abroad, built there under license from the Whitin Machine Works.

The first combers built by the Whitin were 6-head machines, using $8\frac{3}{4}$-inch laps and running at a maximum speed of about 88 nips per minute, the production of one machine those days being about 300 pounds combed stock per week. The demand for combed cotton at this time was great, and the machinery not only expensive, but also too slow in its output to fill this demand for these combed yarns, that there was great call for improvements in combing so as to obtain a larger product per machine with no sacrifice in the quality of the work. The first improvement by the Whitin in their comber, was to soften the action of the cams and reduce their throw, with the result that a comber ran at 100 nips with less vibration than previously built combs running 85 nips.

Heilmann's Inspiration.

Next the Whitin increased the number of heads on their combers from 6 to 8, followed closely by successfully adopting their combs first for 10½" laps and later on for 12" laps, which are the size of laps now fed to their high speed comber; the normal running speed of which is from 130 to 135 nips per minute, *i. e.,* a maximum production with perfect work.

Now it must be distinctly noticed (and this is where the strong point of the Whitin Comber over the Nasmith and the Alsatian Combers comes in) that when the Whitin increased the dimensions of the lap, *i. e.,* the amount of stock fed to the machine, they simultaneously took care to improve the general construction of their comber, first to be able to run them faster, *i. e.,* to keep the combing process up to its standard point and not simply crowd more material into a machine running at a given speed, *i. e.,* overload the latter, and when the result must be far from an ideal combing.

Although the Whitin Machine Works have in their high speed comber increased the *output* from 350 to 1,000 pounds, *i. e.,* about *trebled it,* yet they are using in their new high speed comber the same feed gears, the same weight of lap, the same drafts with the exception of in the draw-box, and the same mechanisms throughout, as what are found in the old style standard Heilmann comber, when they first took hold of it. The favor with which this high speed comber was received by cotton spinners is seen by the fact that although the first comber was not put in the market until October 1905—within a little over one year, over 500 of them were in successful operation in some of our most prominent cotton mills. This is readily explained by the fact that, for example, six high speed combers will produce nearly 90% more work than eight old style combers, occupying the same floor space; again, one operative running six of the high speed combers, will do the work of two running the older style machine. To sum up: the new comber, costing much less proportionately, cuts in two the labor, cost and floor space occupied by the older machine, the quality of work remaining the same.

As previously already referred to, to be able to run the comb at such a high speed, compelled the builders to reduce any chances for vibration as much as possible and which they, considering the old make of comber as a basis, overcame in the following ways:

(1) By eliminating entirely the customary rocking motion of the nipper frame and fixing the position of the frame in the correct position for combing, which, of course, reduces the amount of throw necessary for the opening of the jaws. This also permitted the builders to drop the position of the feed roll proper, so that much shorter staple of cotton can be used than with the old comber, as this brings the bite of the roll closer to the bite of the nippers.

(2) The lifting mechanism of the top detaching rolls, consisting of the usual cams and connections, is eliminated, the top roll being raised and lowered more gradually for piecing, by a bevel on the cylinder shaft segment.

(3) A tension device is applied to the brass detaching rolls to prevent skipping, thus overcoming any tendency of the brass roll to raise or skip its flute.

(4) The actuating mechanism, of the lower detaching and piecing rolls, uses two notched wheels instead of one as heretofore, with their accompanying internal gear. One of these notched wheels is working through the movement of the actuating cam on the cam shaft, while the other notched wheel is resting, to take its turn the following nip, and so on. The speed of the cam shaft is also reduced one-half by the use of double cams and the two notched wheels. Thus, to drive the drawing off rolls there are supplied two actuating mechanisms, each one of which runs at one-half the speed it formerly did with the same number of nips. *This is the vital point in the new machine* for the reason that *here is eliminated* that *vibration* which the builders of the Nasmith and the Alsatian Comber have more or less ineffectually endeavored to avoid and which has prevented them from being able to increase the speed of these combs.

Improvements in the general construction of this high speed comber are:

Combing capacity is increased, twenty rows of needles being used on the half laps instead of seventeen, thus increasing the combing capacity nearly 18%.

Electric Stop Motions of simple construction cover every point where there is likely to be a breakage of the sliver. A tell-tale signal communicates the stoppage of the machine to the operator, thus the care of the machine is reduced to a minimum, as it is impossible for the machine to continue in operation should the sliver break, a roller lap occur or coiler can become full.

A Waste Packer consisting of a tin plate secured between the doffer comb arms presses the waste so that three times as much can be packed into the waste box as formerly.

A Relieving Motion is applied for taking the pressure of the weights from the draw-box and detaching rolls. An automatic device prevents the starting of the machine after the pressure has been removed from the detaching rolls.

A Traverse Motion is applied to the brush shaft whereby the circular comb is cleaned much more effectively than without this motion.

The Circular Comb Brushes are driven by a variable gearing motion of three speeds to compensate for the wear of the brushes.

A Hank Clock showing the number of hanks produced is attached by the builders to draw-box if ordered.

A description of the working parts of the machine. To show the relative positions of the different parts of the machine and to enable the course of the cotton through the machine to be followed a cross section of the working part of this high speed comber is given in Fig. 4. The lap, as coming sometimes from the sliver lap machine or more often from the ribbon lap machine, is placed at the rear of the machine on the fluted wooden rolls *N*, which are driven intermittently through gearing from the end of the feed roll and deliver the lap at the same time that the feed rolls are passing it through to be combed. From these fluted wooden rolls *N*, the lap is passed down a polished slide *A'*, known as the lap plate, to the feed rolls *J K*, which deliver the latter intermittently, and in short lengths, to the nipper knife and cushion plate *S* and *Q* respectively. The nipper knife *S* presses firmly against the cushion plate *Q* and holds the tuft of cotton firmly between them, while the comb portion *Y*, *i. e.*, the half lap of the cylinder *C* passes through the fibres, removing all short fibres not gripped by the nippers as well as any impurities in that part of the lap being combed.

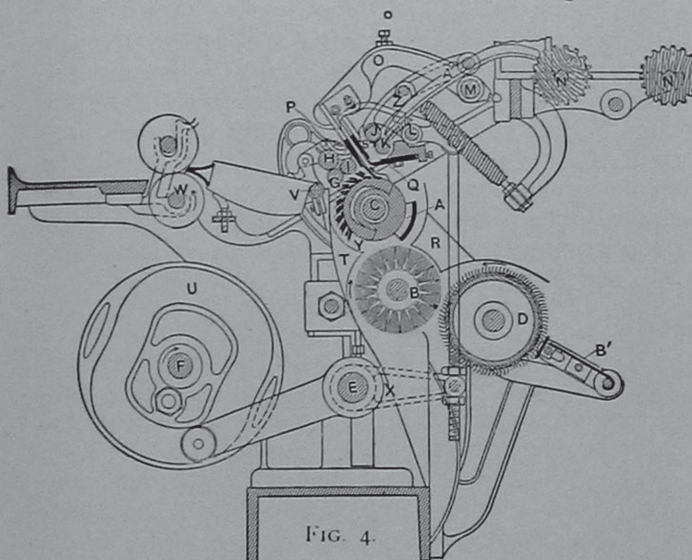

Fig. 4.

Just as the combing action of the cylinder is completed, the roller motion, consisting of the brass clearing rolls *H* and the steel drawing off or detaching roll *G* are turned backward a part of a revolution, which brings back the ends of the fibres previously combed. At the same time the segment *A* of the cylinder comes under the combed fibres and raises the leather drawing off roll *I* which revolves on the segment, so that the combed ends of the fibres are thus gripped and taken forward, overlapping the ends of the previously combed fibres, to thus form a continuous fleece. As the fibres are carried forward, they are drawn upwards into the top comb *P* which is in the path of the fibres, the back ends of which are drawn through the needles of this comb, thus subjecting the whole length of the fibre to the combing action. The amount turned back by the detaching rolls is about half of what is brought forward, so that a continual fleece is passed on through the triangular shaped pan at the front of the rolls *H G*, being in turn converged by a trumpet at the front of the pan into a sliver and from there passed through a pair of calender rolls *W*. From these calender rolls the sliver passes on to the front table of the combing machine and in turn with the other slivers, made in a similar way, enters the draw-box and from there is coiled into a can.

The waste from the cylinder *C* is removed by a brush *B*, which in turn is relieved of said waste by a doffer *D*, the doffer comb *B* in turn removing it from the doffer and packing it into a waste box.

Of the remaining letters of references in our illustration, *F* indicates the cam shaft, *L* the nipper arm fulcrum, *M* the top comb shaft, *O* the top comb arm, *R* the doffer cover, *T* the waste chute, *U* the nipper cam, *V* the horse-tail holder shaft and *Z* the top feed roll saddle.

From description thus far given, it will be seen that most of the motions of the comber, viz: Feeding, Nipping, Combing, Detaching and Attaching and Delivering, are intermittent and are of such a character that they are almost entirely dependent on each other for the proper working of the machine, so that any variations from the correct timings and settings of the different parts as are furnished by the builders of the machine will prevent its economical manipulation.

COTTON SPINNING.

The Ring Frame.

(*Continued from page 350, Vol. II.*)

Care of Rolls and Roll Stands.—The economical operation of the ring frame and the production of a good quality of yarn depends considerably on the proper care of the drafting rolls and roll stands and on their condition. Frequent cleaning and careful lubrication are necessary.

The following practice has been recommended by the Draper Company for the care and attention of drafting rolls, *i. e.*, cleaning and lubrication.

After frames are started in good shape, they should be cleaned three times a year, when all the steel rolls should be taken out, laid on proper supports and thoroughly cleaned, wiped and lubricated, cleaning the flutes by brushing lengthwise with a stiff brush, remedying any roughness in the same way as done with new rolls. When the rolls are put back in place, a small piece of tallow is crowded in between the neck of each roll and the roll stand.

Back and middle bottom rolls should be oiled twice a week with a funnel made for the purpose, put through a hole drilled in the cap-bar, to make it certain that the oil goes where it was intended to go. The front bottom rolls are to be oiled twice a day with a Getchell can. Spinners should never be allowed to use a hook or anything of metal, to clean front rolls when these become wound up, this prohibition will keep the front rolls of frames in first rate condition and prevent scratching. Waste should never be allowed to accumulate until it gets into a lap. Spinners should be taught to take a piece of waste once in two weeks, at least, and rub off the bottom rolls from underneath. If the back and middle bottom rolls get sticky, the roving will run around the middle roll, and this is a great annoyance. It not only lifts the roll up and makes cut yarn on the other end, but it is very difficult to get it off the roll, and in many mills they cut it off, but which practice will rough up the roll and make the matter worse.

Front top rolls should be cleaned twice a day with a sponge dipped in a mixture of equal parts of alcohol and water, the other top rolls requiring cleaning weekly. When frames are scoured, examine top rolls and twist in the hand to see if the covering is loose, after which put them in so as not to run against the end of the lap. Work cannot be made to run well unless the top rolls are in good condition and well cleaned and oiled, and the middle roll should be in about as good condition as the front one. The spinning room cannot be operated successfully if the overseer tries to economize by using too few new rolls or delaying in covering worn ones. The back and middle top rolls should be oiled twice a week on their middle bearings, and once a week on their end bearings. This oiling is done with a can, but for oiling the front top rolls, where special care is necessary, it is best to use a conical tin tube containing a piece of sponge saturated with oil crowded into the small end, this tube being put on the finger of an operative, like a glove finger. The oiler then takes a can in one hand, and with this tube on one of the fingers of the other hand, passes rapidly along the frames, putting a drop or two of oil on each bearing of the roll by pressing lightly on the sponge. This gives all the oil necessary for complete lubrication, and leaves no surplus to run off or get on the leather of the roll. This oiling is done twice a day on warp, and four times a day on filling frames, because the latter on account of requiring less twist, run at greater speed than the former. While all other parts of a frame may be oiled with mineral oil, the top rolls should be oiled with sperm.

The saddles should be oiled either with the tin tube and sponge just mentioned, or with a Thompson can with a very small opening. A great many rollers are spoiled, and a great deal of bad work results from the careless use of oil. With modern frames, where the bearings extend above the cap bar, they are much easier to keep clean and well oiled than formerly.

In connection with the cleaning and care of rolls and roll stands, the following suggestions will be found useful: In cleaning bottom rolls, four pieces of 1½ by 2 inch stuff are usually used as a support to lay the rolls on. Each piece has three notches at each end and the pieces are laid across the frame under the rolls, being made long enough to project about 8 or 10 inches out on each side of the frame. The rolls are lifted out on each side and laid in these notches, taking care to keep the rolls in a straight line to avoid bending.

If the necks of the bottom rolls are found to be worn, allowing the roll any play, thin strips of copper may be placed along the squares, or else the squares should be roughed up with prick punch, and driven up tight into their sockets with a copper hammer. Care should be taken to add the same amount on each side to keep the rolls true. However, relief will be temporary only, as the roughening or copper will soon wear down and allow just as much play as before. It must be understood that this method is only permissible in cases where the wear is very slight and other repair would be impossible to be obtained without much delay and expense.

If the necks or roll stands are found to be worn, by stretching a cord along the bottom of them, it may be seen where the wear mostly comes. If the wear is slight, very often a strip of copper placed in the stand and bent around to fit the roll will remedy the trouble, or if all three bearings of the stand are found to be worn about the same, this can be corrected by raising the roll stand, inserting a piece of tin under it. Usually, however, the front roll takes nearly all the wear. If the stands are worn very much, they should be babbitted, or new stands ordered. If the necks of the front rolls are found to be worn very badly, they should be renecked. This is usually done at the mill. The neck is cut off with a hack-saw close to the flutes and the roll is bored out for about 2 inches. A piece is turned for a neck and driven into this hole and squared at the other end to fit the socket. The neck piece should be made a driving fit in the roll and then pinned.

After putting back the rolls, the saddles, stirrups and levers should be carefully looked over, and the lever screws adjusted so that the levers set about the same, just a little above level, which will give even pressure on the rolls all along. Weights should be hung from the same notch of each lever and the holes cleaned out, so that they may hang freely, otherwise the stirrups will press against the roll, wearing both rolls and stirrups.

(*To be continued.*)

The Manufacture of Artificial Silk in France.

The three processes used in France in the manufacture of artificial silk are, the nitro-cellulose, the cupro-ammoniacal and the viscose.

The brilliancy of fibres obtained by the nitrocellulose process is perfect but their resistance, especially when wet, leaves much to be desired. This is the defect of all artificial silks, to remedy which all efforts have been tried in vain.

The principles of the cupro-ammoniacal process produce silk that is radiant and holds together easily. Its cost of production is less than by the nitrocellulose process.

The silk produced by the viscose process has the same qualities and defects as the others, but it is more economical.

To remedy the lack of resistance of artificial silk, especially when wet, hundreds of processes have been proposed, but no one of them has given satisfaction, although a producer in Lyon claims that his process is really effective.

For certain uses artificial silk may be substituted for the real silk; it has more brilliancy, but less suppleness and a different touch; its greatest defect, however, is that of being less resistant, especially when wet. Another difficulty is its specific weight, which is 10 per cent greater than the real silk and gives for the same weight a very important diminution of returns.

The present annual production of artificial silk is as follows:

Nitrocellulose silk, 2,645,000 to 3,300,000 pounds;

Cupro-ammoniacal silk, 2,200,000 to 2,645,000 pounds, and

Viscose silk, 880,000 to 1,100,000 pounds. France produces between 1,100,000 to 1,240,000 pounds of the three kinds. The cost of production varies, according to the process employed, from $1.93 to $2.90 per kilo (2.2 pounds).

JACQUARD DESIGNING.

(Continued from page 3.)

DESIGNING WITH ONE (1) SYSTEM OF WARP AND TWO (2) SYSTEMS OF FILLING

This arrangement of forming a fabric structure, finds extensive use with all classes of figured work, dress goods, upholstery, shawls, etc. Different methods of producing designs are in use, amongst which are:

(1) The warp forming with one system of filling a ground structure, the second system of filling producing, by means of floating, either on face or back of said ground structure, the design.

(2) Producing by means of the first mentioned filling, or by the warp, or by both, additional effects to the design, as produced by the second system of filling.

(3) Figuring with both systems of filling, using the warp as an interior system, and

(4) Figuring with both systems of filling as well as with the warp.

We will take for our present article, the first mentioned system of designing, *i. e.*,

Fig. 38.

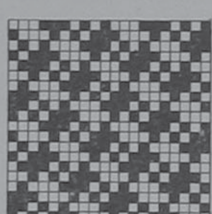

Fig. 40.

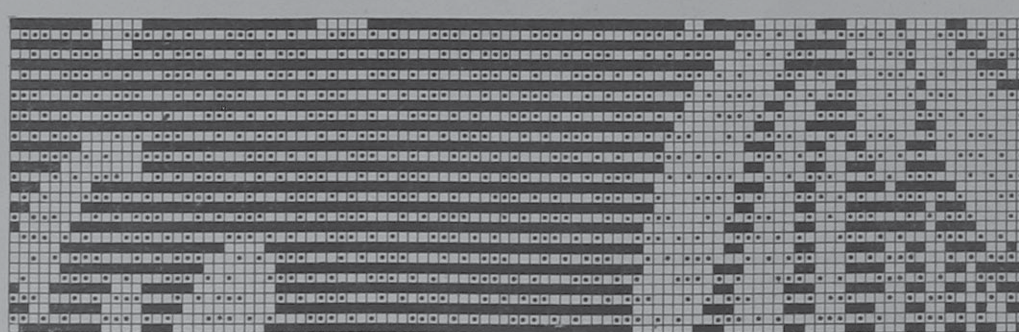

Fig. 41.

Forming the Design by Means of Floating One System of Filling Upon the Ground Structure, as Interlaced by the Warp and the Other System of Filling.

Although most any design can, and is used for this system of fabric structures, yet it will be of advantage to select well broken up, as well as well distributed figures for the sketch, in order to give to the fabric all possible strength. This system of designing is best explained by means of a practical example, and for which reason, sketch Fig. 38 is given.

With reference to the style of the design, the same shows the chrysanthemum, arranged after the 5-leaf satin setting, two repeats, warps and filling ways, *i. e.*, four repeats of the complete design being given. This figure, as can be readily seen, is of such a character as requires little (if any) stitching down of large filling floats, a feature, which is clearly demonstrated by its execution on point paper (see Fig. 39).

Fig. 39.

Preparing the point paper design. In the same, only the warp and the figure picks are taken into consideration, since the cards for the ground picks are cut independent, and simply added when lacing the set of cards. For this reason, when selecting the proper point paper to use, we only have to ascertain the warp and the figure picks per inch.

For Example: Fabric for sketch Fig. 38 to be made with a texture of 80 warp threads by 160 picks. This means, that 80 warp threads, 80 figure picks and 80 ground picks, per one inch, are to be used.

This combination indicates the proportion of warp threads to figure picks to be 80 : 80, which equals 8 by 8, 10 by 10, or 12 by 12 point paper to be used.

We used the 8 by 8 point paper.

Width of repeat in sketch is $2\frac{1}{2}$ inches, thus $2\frac{1}{2} \times 80$ (warp texture) = a 200 Jacquard machine, *i. e.*, 200 needles of a 200, 400, 600, etc., Jacquard machine