

### A STUDY OF KNITTING.

(Continued from page 248.)

IN MAKING SEAMED FULL-FASHIONED HOSIERY, the stocking is first knit in a flat piece called a *blank* which is afterwards made into tubular shape by joining its opposite edges by hand knitting, seaming or looping. A stocking made in this way will have a seam down the back of the leg and heel and another seam extending under the sole of the foot, or, two seams in the foot, one on each side, accordingly as the foot is made. When knitting a full-fashioned stocking, the piece is begun at the top, with a welt to keep it from unraveling, and the web is knitted of uniform width until the calf of the leg is completed then the web is gradually narrowed, by transferring stitches from the edges to the middle part of the web, to form the ankle of the stocking and this is continued until the heel is reached. At this point two yarn guides are put in action, each being used for knitting half of the heel piece at opposite edges of the web, the intermediate needles not taking part in the work, as the stitches are cast off from them during this operation. The two heel pieces are knitted of uniform width until the point is reached for rounding off the heel, when they are rounded off and then gradually narrowed to form the desired shape, by transferring stitches from the needles in the same way as was done for narrowing the blank at the ankle. When the heel pieces have been completed, the blank is cast off from the needles of the machine and is then transferred to another machine which completes the foot, the web being narrowed by dropping stitches at the sides to form the instep and also at the toe so that it can be rounded properly. In transferring the blank to the second machine, the selvedge edges of the heel pieces are fixed, loop by loop, upon the outer needles, the intermediate needles receiving the loops of the instep part of the web, and when the transfer is completed, the second machine takes up these loops and forms stitches with them from its own yarn feed, making the web continuous. The second machine is called a *footing machine*. Some styles of full-fashioned hosiery are made by methods and machines that require the transference of the web to three or more different machines to knit the leg, heel pieces, foot and toe respectively, the advantage of this system being that a more perfect shape can be given to the finished stocking by knitting the parts separately and no time is lost in changing the action, as with the single machine. The different sections are joined to one another as the knitting proceeds by transferring the last row of loops in the section to the needles of the machine that knits the other part of the piece, thus making a continuous web.

The special merit of full-fashioned hosiery is that it is made to conform to the shape of the leg, foot, etc., and therefore does not lose its shape, and it is also much more elastic than hosiery made with the latch needle, as it is made with the yarn under slight tension, by spring needles.

On account of the great variety in the styles and finish of hosiery there are a number of terms used to

designate certain kinds or to indicate certain finishes. As these are of interest to the student of knitting, definitions of the most commonly used and descriptions of the method or operation by which the effects or finishes are produced will be given here.

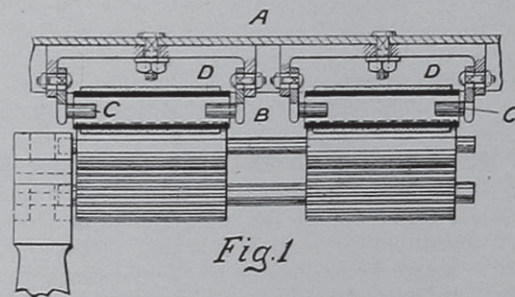
Full-fashioned, plain and ribbed, and seamed and seamless hosiery have been previously mentioned.

**Reinforced, or spliced, hosiery** is a term applied to socks or stockings which have been reinforced or strengthened or spliced at certain parts, usually at the heel and toe, sometimes at the knee also for children's stockings. This is done by knitting a second or thickening thread in with the primary thread of the stocking during the formation of the heel and the toe, both threads being fed to the needles as one thread and made into the same stitches. In some types of machines, this second thread is fed in and thrown out automatically, several devices being in use on different makes. In other types, the second thread is fed in by an attachment attended to by the operator, the idea being that some attention will produce better results than an automatic machine will by itself. To prevent the fabric from being made closer and harder at the reinforced parts, and consequently less elastic, the stitches should be lengthened somewhat while these parts are being knitted.

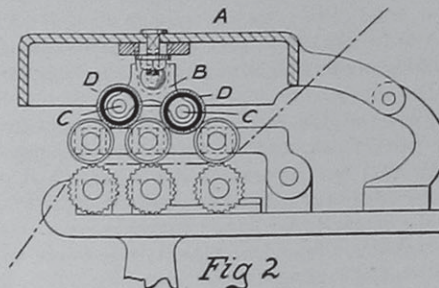
(To be continued)

### A Top Clearer for Cotton Spinning Frames.

The gist of the invention consists in connecting the clearer rollers to the cover, said clearer rollers thus



being lifted any time their cover is raised. Fig. 1 is a front elevation of the rollers of a roving, etc.,



frame with the clearers *D* and cover *A* in section, and Fig. 2 an end elevation with the clearers and cover in transverse section, the latter being in normal working position.

Examining the illustrations, we find inside the cover *A*, brackets *B*, the latter being adjustably secured by bolts, each bracket being provided with pins *C* projecting towards one another. *D* are the clearer rollers, each formed of a tube with ends much wider than the diameter of the pins *C*. The ends of clearers *D* are placed over the pins *C*, which however, are in this case in no sense pivots, as the clearer rollers *D* revolve upon the drawing rollers altogether independent of them and their only function is to raise said clearer rollers simultaneously when the cover *A* is raised. As the pins are stationary, fly is not liable to accumulate upon them but should such be the case, it will not interfere with the rotation of the rollers.

#### Unshrinkable Wool and Union Fabrics.

This forms the object of a late English patent which besides accomplishing the above result, at the same time claims that the process increases the affinity to dyestuff. As an instance, a piece of wollen muslin weighing 5 lb. is run on the wince through a solution of 20 lb. of hydrochloric acid in 10 gallons of water. When the piece is impregnated, a solution of 2 oz. of permanganate of potash in two quarts of water is gradually added to the acid solution, care being taken that after each addition, the liquid is decolorized before the next addition is made. When the whole of the permanganate has been added and the bath is decolorized, the piece is taken out and washed in water. The presence of the acid prevents the formation of hydrated peroxide of manganese on the fibre, while the action of the permanganate of potash deprives the wool of its property of felting or shrinking, at the same time increasing its affinity for the dye.

#### THE LOOPING OR SEAMING MACHINE.

This machine, also called the turning-off machine or ribber, forms one of the most important links in the manufacture of knitted fabrics. Although the construction of the mechanism of the machine is based on the fundamental sewing-machine motions, yet it is entirely void of any improvements known to the modern sewing machine, little or no improvements having been made for years. Although other machines have been tried, the old-style looper is still in use, though slow in motion in producing the beautiful flat effect and effectually combining the sewing thread with those of the fabric.

The looper is the only practical mechanism that will give satisfaction and do the work perfectly, due to the fact that the success of the operation depends on first securing each separate knitted loop of both parts of the fabric to be joined together on a separate point or needle. This fact makes it possible to cut, ravel or trim the unnecessary thread or fabric away from those loops before sewing, thus producing an even, flat joint, so exact that the two parts joined together appear to have been knit in one piece. To a majority of people who wear garments made in this manner, the idea of it being in two or more parts,

knitted on different machines is not known. For instance, the fabric used in making the body of the garment is knitted on the body machine while the firm, but elastic rib or cuff is knit on what is known as the rib machine. It is due to the joining of this rib to the fabric that the looper is also sometimes called ribber.

The rib machine is built on different lines from the body machine, inasmuch as it has two sets of needles and produces wales on both sides of the fabric, while the body machine produces it on one side only. Another feature of the rib machine is that the needles are manipulated in and out of the yarn loops successively in groups, as the operation progresses, which varies according to the number of needles desired to produce the necessary fabric. The motion is *irregular* and the production necessarily slow. In the body machine, the motion is *continuous*.

With the looper or seaming machine, the motion and speed is regulated by the speed and accuracy with which the operator works and the movement is naturally constant. To one who is not familiar with this operation it would undoubtedly look very simple and easy, as the operator puts the loops of the fabric to be joined on the points of the disc, one by one, each loop on a point, but it requires but little time before one becomes firmly convinced that it requires quick and strong sight, accurate and nimble fingers and that the machine is capable of running far quicker than the most experienced operator can loop the points in the proper manner to obtain perfect work. Years have passed since the first looper was brought into the market, and as was mentioned before, other machines were since introduced, all to fall before the looper, chiefly on account of the inability to use them on fine work, although they did have some success on other classes of work.

Among the substitute methods for producing quicker production, and without doubt the one that proved most satisfactory was one which was derived from the Overlock stitch. It consists in placing a row of these overlocking stitches along the edge of each part of the fabric, joining them in such a manner that the loops form two continuous selvages and another operation will join them. This method is quicker, stronger, than the other substitutes and produces the desired flat seam.

Another device was known as the pin-wheel sewing machine, constructed in various types. In this form of machine the principle of the wheel, of points to hold and convey the fabric to the needle was used. The necessity of hooking each loop on a separate point was eliminated by means of an exceedingly fine feed. This method, although it was speedier in its operation, did not produce the finished appearance obtainable by the original looping method and has become almost obsolete, due to the fact that while some of the combining stitches would be made between the wales of the fabric, each knitted loop would receive but one.

Among the various improvements and devices designed, primarily to assist the looper in this work and reduce the time required for the process of looping, we will take into consideration those which were

intended to remove the superfluous material projecting above the feed wheel points and prepare the hooked loops for the final sewing operation. This work was required of the operator previous to its introduction, although the work did not require much time, an expert being able to cut and brush away the unnecessary material very quickly, but these did show an improvement, since the operator could devote all her time to looping the fabrics on the looper points.

The other attachments operate in various ways, the most practical acting on the brushing and cutting principle.

of loops near the raw edges of the fabrics, they being in such a position as to bring the respective faces together.

The machine is now set in motion, the rotation of the disc causing each pair of loops to come in direct contact with the needle, which travels in the arc of a circle and when in this position parallel with and above each point. By means of depression in the top of the points, the thread-carrying needle is enabled to enter each pair of loops, this operation in connection with a properly adjusted looper which operates simultaneously with the needle's thread, produces a joint

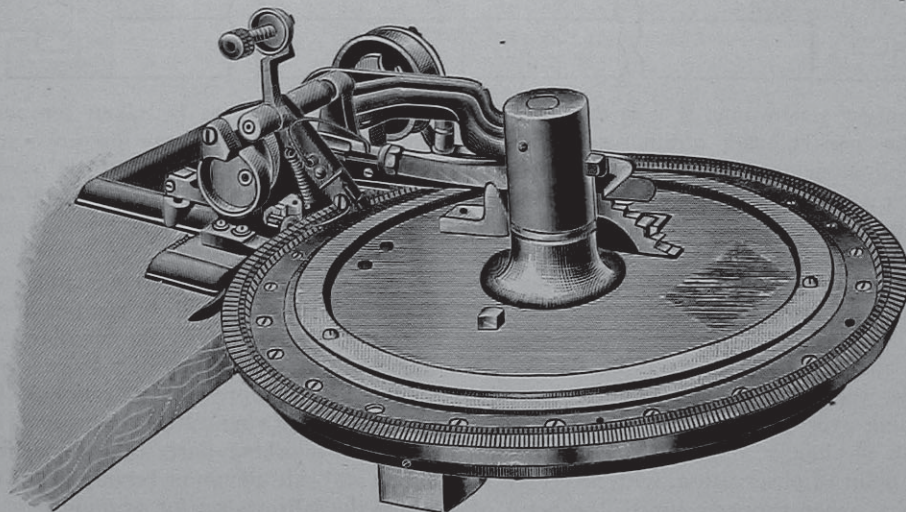


FIG. 1.

In order to assist in the production, maintain the perfection of the finished fabric and convenience, loopers are made in two types, viz., Straight Bed and Circular Looper.

**STRAIGHT BED LOOPER.** This type of looper is used in connection with *full fashioned* stock, and is the simplest of the two. The method used in the operation of this machine is to secure the loops of the respective fabrics on the looper points which are arranged along one side of the machine. The sewing or stitch-making parts are arranged on a traveling carriage and while the fabric is held stationary, the needle looper and its auxiliary parts are moved automatically from loop to loop, as each stitch is finished.

**CIRCULAR LOOPER.** This machine, as the name implies, is circular in form and is used generally in connection with cut stock.

To secure the best results and facilitate in the successful operation of the machine, the looper should be securely fastened to a good substantial table. It need not be very large, only sufficient space being required to accommodate the machine; care being taken, however, to leave several inches clear of the diameter of the disc, in order to give the fabric free movement while revolving on the disc. To secure the desired result, the two pieces to be looped are secured on the looper points of the disc in such a manner that one of the points passes through each of two series

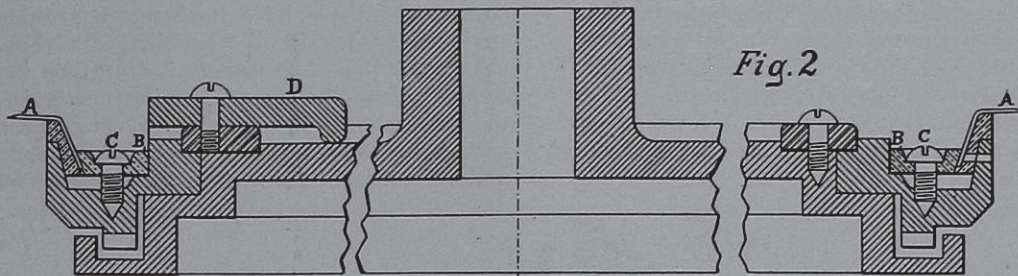
of the two fabrics which is imperceptible to the untrained eye.

Another thing in connection with successful operation and perfect production is the necessity of trimming the free edges of the material down to the loops that are required to be secured on the looper points; without this, the raveled threads and loose waste catch in the needle and produce an objectionable seam. The speed of the machine, as was mentioned before, all depends on the skill and accuracy of the operator in securing the loops on the looper points, the most skillful managed running on an average of not more than 300 or 400 stitches per minute, according to the class of work under operation as well as *Make of Looper*.

As a matter of explanation as to the character of the stitch, it may be said that the stitching functions of both loopers are to a great extent alike, both producing the same final result, a perfect joint or seam. On the same machine, by means of different arrangement of these parts in their working relation to each other, automatic feed, time, etc., a number of different stitches are produced, such as the "*single stitch*," "*under and over*," "*through and through*," or "*double stitch*," using one or two threads, each stitch being of some advantage for the work to be produced. In other types of loopers, the needle, which is always a curved one, works from the inner or butt end of the looper points outwardly, in other types in the opposite direction.

Like any other mechanism, the looper requires adjusting from time to time to secure the best results. If for instance, there should be several stitches out or dropped, examine the needle. If broken or injured

this preparing the groove for the new looper point. After the point is placed in position, drive it home with a suitable tool, and smooth the brass edges down around it and replace the brass cover.



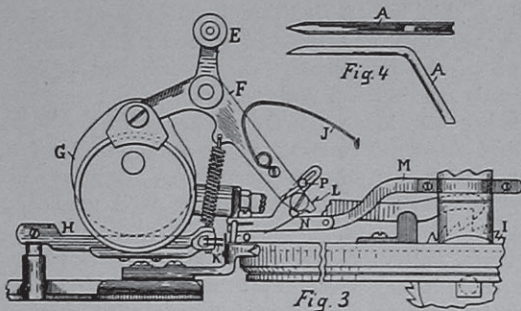
beyond repair, insert a new one, if it is due to dullness, such needles can be made again serviceable by the use of an oil stone, precaution being observed, however, to have the under side as low as possible, enabling it to enter the loop. Note the position of the point of the needle, see that it is directly above and parallel with each looper point. Again, skipping or dropping is often due to the fact that the hook or looper requires readjusting. Another thing to take in consideration is the fact that when taking the looper from the needle, the former must slightly rub the latter when passing over it. Again, the needle may be out of time with the looper, due to too quick or too slow action. A point of observation, with reference to this matter, is that when properly timed, the point of the needle in entering the loop on the hook should be about one-sixteenth of an inch from the latter and just clear the heel of the looper. Again the hook, after receding from the needle, will take a forward motion and pass under the needle, just touching it. The hook, when at its lowest point, will be about one-eighth of an inch from the point brass.

Another thing to be taken into consideration is that the points on the large disc must act simultaneous with the sewing device, and if the points and disc are not entirely true they may be made so by loosening the set screws in the main arm of the machine and adjusting the disc.

As a matter of reference and explanation, the illustrations given will bring out more clearly the operation and design of the circular looper, of which Fig. 1 shows a specimen of a looper in its perspective view. Fig. 2 represents a sectional view of the bed plate and point ring. Fig. 3 represents a side elevation of all the working parts of the machine, and Fig. 4 a plan and side elevation (enlarged) of the points upon which the fabric is set for seaming.

In Fig. 2, *A* indicates the looping points, *B* the clamp plates, and *C* the clamp screws, for the replacing of broken or defective points. *D* represents a friction clamp, which is used to avoid the point ring from being easily moved out of alignment with the needle by the operator when putting the fabric on the points.

With reference to Fig. 3, *E* represents the sewing thread tension of the machine, and which should be always sufficiently tight to draw the loop tight enough to clear looper hook *K* after it has been cast off from it. The tension or take-up spring *J* draws the loop or stitch tight, after it has been cast off the looper hook *K* and the needle *L* has been withdrawn. By the adjustment of the tension or take-up spring *J* a slightly variable tightening of the length of the stitches may be obtained. *F*, *G* and *H* represent respectively the needle arm and its eccentric, also the cams and looper hook arm. All these parts are permanently adjusted on the machine before it leaves the works, hence no further reference to it is required. Looper hook *K* is adjustable, both in a horizontal and vertical position; the vertical position should be such as will permit the needle to enter the hook central between the tongues, whereas the horizontal position should be such as will permit the top tongue of the hook to take the thread from the eye of the needle about one-quarter of an inch back of the eye, the needle *L* being adjustable for this purpose. *I* is a rack, having a suitable number of teeth to suit the gauge or number of points in the machine. It is adjustable on its shaft, so that the points can be set to index with the needle, a feature necessary with machines of this kind.



Another very important fact is to have a perfect smooth hook of suitable shape to allow the loop of thread to glide off easily as the needle takes a new loop and at the same time keep the loop from dropping off after it has been taken. Another point, have your thread taut while needle is passing through the loop and rather too fine than too coarse for the needle.

From time to time it may be necessary to replace a looper point, which is accomplished by removing the brass portion which covers the bottom of the damaged point, removing it with a steady, quick upward pull,

*M*, *N* and *O* represent an elastic stitch attachment which can be applied to this machine, the same consisting of a bracket *M*, which is clamped to the centre post of the machine. *N* is a pivoted lever, in which is set a stitch finger *O*, which being in the path of the thread, has the loop formed around it at the same time the stitch is through the loops. This finger remains in the loop until the needle arm *F* has nearly completed its movement, and when arm *F* comes in contact with stud *P* in arm *N*, it raises the finger *O* out of the old stitch prior to forming a new stitch.

Loopers are built in one size only, the number of points per inch varying to suit the gauge of the knitted fabrics to be looped or seamed. The following gauge and number of points will be found the most suitable for a general line of work:

16 to 20 needles per inch	=	20 point loops.
14 " 17 " " "	=	18 " "
11 " 15 " " "	=	17 " "
10 " 12 " " "	=	16 " "
8 " 10 " " "	=	14 " "
7 " 9 " " "	=	12 " "
6 " 8 " " "	=	10 " "
5 " 7 " " "	=	9 " "
4 " 6 " " "	=	7 " "

The speed of machine should be equal to the skill of the operator, the production varying according to the gauge, from 30 to 100 doz. per day.

In the May issue this subject of Loopers will be continued, taking the Large Dial Julius Koehler Looper, also known as the German Looper, as theme.

### THE BLEACHING, DYEING AND FINISHING OF KNIT GOODS.

(Continued from page 39.)

An older type of machine is the scouring tub, called "dolly," which consists of a tub placed on a revolving table, above which are placed three heavy hardwood beaters, which perform the beating or mechanical work of washing. The beaters are raised by cams and drop by their own weight when free, the cams being placed alternately on the cam-shaft, so that the beaters will be made to fall alternately on the goods. The rotation of the tub insures the exposure of the entire lot of goods to the action of the beaters, several tubs being generally placed on the revolving table. In a later style of these machines, the washing tub is square, and is given a motion forward and backward under the beaters, so that there is a continuous movement of both goods and liquor in the tub.

**Operating Scouring Machines.** With underwear, the goods are usually entered into the washing machine in a loose condition, or the garments may be made into bundles of a half-dozen or dozen pieces. Hose are stitched together in pairs or are tied together loosely in bundles; sometimes a number of pieces are loosely placed in porous bags and entered according to the method by which they are to be

treated. Small articles, such as babies' socks, gloves, mittens, etc., are stitched together in pairs and washed in bags, this saving much trouble in sorting after they are washed. The main point to be observed is that articles shall be entered evenly and uniformly into the washing tub or machine, and that they be kept covered with liquor, if in a tub.

In a washing machine, such as previously described, the goods or pieces are put into the separate compartments loosely, having each compartment filled with about the same quantity of goods so as to balance the cylinder, the doors are then closed, after which the wash liquor is run into the tank, steam turned into the pipe and the machine started. The cylinder should be rotated slowly at first, so that the wash liquor will fill each compartment in turn and saturate the goods, after the goods are thoroughly saturated it can be run faster. During the revolutions of the cylinder, the wash liquor penetrates each compartment as it passes through the tank and fills it, then as the compartment rises, the goods fall from one side of it to the other, thus moving them through the wash liquor and exposing new portions continuously to its action. After the goods are thoroughly washed and cleaned, the liquor in the tank is drained off and fresh water run in, the goods then being well rinsed in changes of water until perfectly clean and free from soap or alkali.

When the goods are rinsed sufficiently, they are drained and squeezed or hydro-extracted, and are then passed on to the bleacher, to be bleached. If the underwear or hosiery is to be finished in natural color, unbleached, the pieces are sent to the boarding room while still wet, where they are put on boards or frames to be stretched into the proper shape, and dried in this stretched condition. When dry, they are removed from the boards or frames and sent to the finishing room, where they receive their final trimmings, bands, buttons, etc.

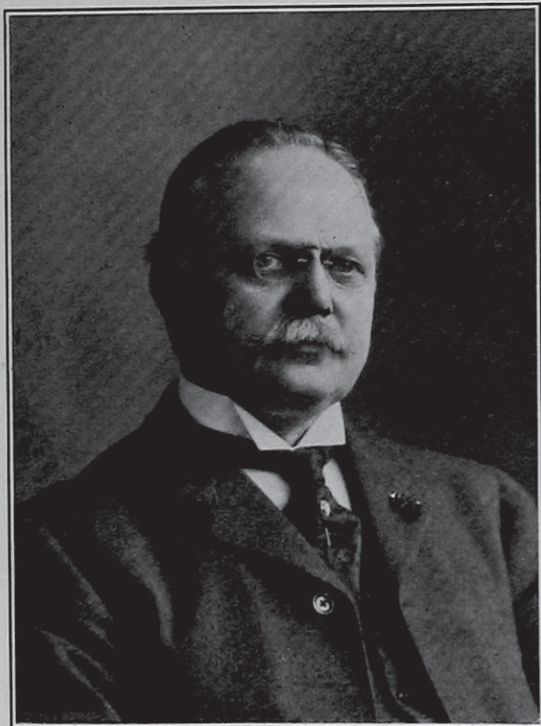
**Roll Washing.** Knit goods, for underwear, are now frequently knitted in rolls of considerable length, the so-called "flat goods," and the custom of dyeing the goods before the roll is cut up into garments is becoming more widely adopted every day, hence it is necessary to wash the knitted fabric in one long piece or roll, just as it comes from the knitting machine. The washing of these goods is carried out as follows: The goods, as received from the mill in rolls, are first unrolled, and are then boiled out, usually in an open kier, in the usual solution of soap and alkali. When the worst dirt, grease, etc., are removed, the fabric, in the piece, is then put through the washing machine, in the same manner as previously described for piece goods, after which they are rinsed, extracted and passed on to the bleacher or dyer. Precautions must be taken that the fabric, which will be in long pieces, does not become tangled or knotted or torn during the process, and it will add to its final appearance, and to its easy handling in the dyeing or bleaching process, if it be passed through rollers after being rinsed, pressed out flat and rolled up neatly when dry.

(To be continued.)

## Philadelphia—The Textile City of this Country.

### Public Dye and Finishing.

Philadelphia is not only the home of the textile industry in this country, but at the same time the largest



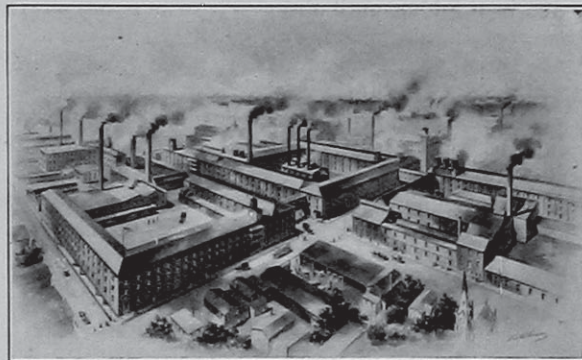
*Mr. Jules A. Kerlé, Gen. Manager.*

and most important textile manufacturing city of the world, and this at the same time with the greatest of varieties of goods, from a low priced cotton cloth to the most exquisite silken fabric, from the plain woven fabric of the roller or cam loom to the most intricate constructed Jacquard weave, including also the spinning of all kinds and varieties of yarns for home use as well as for outside trade.

Philadelphia, also rivals any city of this country with reference to the building of textile machinery, and as to varieties of its build no other city comes near it. This city also has the distinction of more individual textile manufacturing concerns of consequence than any other city in the world, in fact, more than any other entire state of this country. With the exception of a few of the larger plants, and such mills where no dyeing and finishing of the goods is required after they are woven, like carpets, rugs, etc., most of the manufacturing establishments only weave their goods, some spinning their own yarns as well besides weaving and have them finished outside their mills by concerns known as Public Dyers and Finishers. There are some 90 of these plants in operation, the most prominent of them is the *Firth & Foster Co.* When it is considered that the approximate annual value of the products of the dyers and finishers in this city aggregate over Four Million Dollars, or about 1/10th

of the entire products of this industry in this country, and that the Firth & Foster Company occupy a unique position at the head of it, the extent of their influence in the trade far and wide is readily seen.

This firm started in business in 1857, dyeing only



*Bird's-eye View of the Plant of the Firth & Foster Co.*

yarns in the skeins and warps. The total number of hands numbered 25. In 1878 piece dyeing was introduced, practically a new plant added. The growth of this branch was rapid and encroached so much on the yarn dyeing finally crowding the latter out entirely thus getting the plant of to-day to be used



*Mr. Albert Foster, Superintendent.*

exclusively for piece dyeing. The small army of employes on the pay roll now is quite in contrast to the few hands employed then and the record of unbroken business activity for over 40 years is an enviable one.

They are able to turn out more dyed and finished fabrics than any other concern in the same line of business and the capacity of the plant is about 40,000 pieces monthly averaging 40 yds. per piece or over one and



*Mr. John H. Foster, President.*

a half million yards of goods per month. To do this a floor space of over five acres is required in the buildings located between York, Emerald, Boston Ave. & Adams St., in the heart of Kensington.

As will be readily understood, the work done by this immense dyeing and finishing concern is not limited to Philadelphia products only, but they receive goods from manufacturers, jobbers, and commission houses from all over the country, New York commission merchants and New England manufacturers sending large consignments. Either the commission merchant buys his goods in the grey, scoured, or fulled and scoured state, and hands them over to them for dyeing and finishing, or the manufacturer sends goods on his own account. The reason for such a transaction, when considering that many of these mills have their own dyeing and finishing plants, rests in the fact that they simply cannot produce results up to the Firth & Foster Company standard, a feature readily understood when taking into consideration that this firm was started so many years ago by practical dyers and finishers from England who have made this particular business a life study.

The fabrics which they handle are all wool, silk and wool and wool and cotton piece goods. They have the distinction of being the only public dye-house in this country which finishes cotton warp Serges and Italian Linings for the trade. They also were the first

to dye colored silk warp Henriettas, and in colored silk and wool goods cannot be equalled in the market to-day. The firm has a number of *specialties* for which it has made a reputation. Amongst these are the re-dyeing of *cold pigs* as the trade terms them. In this, unusual success has attended the Firth & Foster Company. To the lay mind this term is one not readily understood. Reduced to plain language it means simply that where certain lines of goods introduced on the market *do not take* as well as others, they are sent to them to be re-dyed in colors different from what they were originally. Thus a shade that did not make a hit because of some change in the fashion is converted into another in such a clever manner and with such precision and attention to detail that it is oftentimes very difficult to detect that the goods had been re-dyed.

Another specialty of this concern which attracted our attention on our last visit to this immense plant (and it took us just four hours to travel through it) was the dyeing and finishing of Eolienne's, a silk and worsted fabric with silk as a base, and received in the gummy condition. The finished results shown, for brightness of colors and lustre, were marvels of the dyer's art.

A further interesting feature noticed by us was that *Peroxide Bleaching* is the only bleaching process in use, entirely superseding the old sulphur-bleaching



*Mr. Edward Firth, Vice President.*

process, a feature which explained the clear, lustrous appearance of the various styles of dress goods in cream and pastelle shades, bringing out the delicate

patterns to perfection.

The gigging department was running to full capacity, face goods and cheviots coming again into vogue. These promise to be a great factor for the fall trade, also Wavy Zibeline Cloakings.

Among the various lines of goods in process we noticed Billiard Cloths sent to them from Massachusetts, Fancy Worsteds from Rhode Island, Alpacas from Connecticut, Silk and Worsted Dress goods from Paterson, Cold Pigs from the Atlantic to the Pacific, in fact, the receiving room looked to us as if every state of the Union had made it an object to send a few dozen cases or bales of goods that morning, and still their heavy teams kept coming in loaded down with goods to be dyed and finished.

As to the parties at the helm of this immense plant, Mr. John H. Foster, the only survivor of the founders of the house, is its president. Mr. Edward Firth, a son of Mr. Thomas Firth who established the house in 1866, is the vice-president. Mr. Albert Foster, a nephew of the president, is the superintendent of the works, and Mr. Jules A. Kerlé, the firm's business manager since 1878, who without question is one of the most widely known men among the textile and the dry goods trade in this country.

#### PRODUCING DESIGNS IN FABRICS BY A CHEMICAL PROCESS.

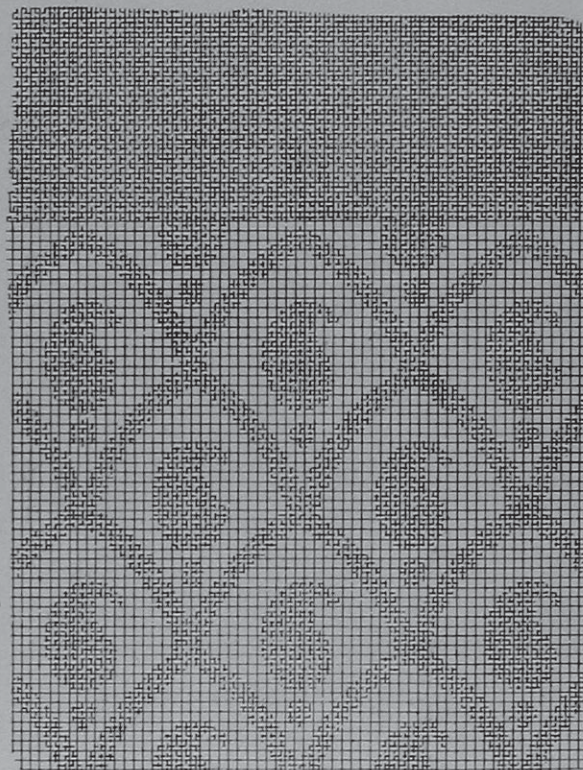
This new process, a late Scotch invention by Mr. C. W. Fulton of Paisley, relates to the formation of designs in textile fabrics, by the removal of parts of the threads or fibres of which the fabric is composed; *i. e.*, the fabric is chemically treated to destroy parts of some of the threads or fibres, leaving the other parts more open in mesh. Either the ground or the figure portion of the design is thus treated, *i. e.*, brought out more open in mesh.

The accompanying illustration shows a portion of a fabric, the upper part of which is shown as untreated and the lower part treated according to the new process.

The chemical substance used for destroying the threads is applied to the fabric by rollers having on them engraved the pattern to be reproduced. The chemical itself may be a substance in the form of a liquid applied as a thin coating so as not to run over the fabric and thereby leave uneven edges, or it may be in the form of a semi-fluid or a paste. Further, it may be a substance which acts to destroy the required threads without any further process than the mere application, or it may be of such a nature that it will not act until heated or subjected to some other treatment.

When applied to a fabric having wool and cotton threads arranged alternately, or in other order or proportion, either in the warp or filling, or in both, the chemical employed may be such that it will destroy the cotton threads without affecting the woolen threads. Again, the chemical employed may be such that it will destroy the woolen threads and leave the cotton threads intact. Furthermore, both effects may be combined, that is to say, the cotton threads may be

removed at certain parts of the fabric and at other parts the woolen threads. By this means a further effect can be produced in the resultant fabric, since if the woolen and cotton threads differ in color the open work or gauze-like effect will show one color where the cotton threads have been destroyed and another color where woolen threads have been destroyed.



When treating a fabric composed of woolen and cotton threads, aluminic chlorid is the substance used, and which is conveniently applied in a pasty or semi-fluid state by an engraved printing roller, after which the fabric is subjected to a dry heat to liberate the acid and destroy the cotton threads in the part treated, after which the remains of the destroyed threads are removed by rubbing.

Fabrics having more than two materials in their composition may be similarly treated and parts of the threads, or some of the substances which may exist in either or both, the warp and the filling, may be destroyed by suitable chemicals applied, one after the other; for example, by a separate roller for each chemical or chemical compound or otherwise, or a single chemical agent may be employed which will destroy the threads of more than one of the substances simultaneously. In all cases, however, whether one chemical substance or more are used, at least one series of fibres or threads or the fibres or threads of at least one of the materials composing the fabric, must remain at the parts treated to produce the gauze-like effect in the fabric.

When the latter contains woolen or silk threads

(Continued on page viii.)



## BUYERS' INDEX—Continued

**Power Transmitting Machinery.**  
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Littauer, Ludwig.  
Queensbury Mills.

**Wool Washing Machinery.**  
Hunter, James, Machine Co.  
Philadelphia Drying Machinery Co.

**Worsted Yarns.**  
Campion, Richard.  
Littauer, Ludwig.  
Queensbury Mills.

**Yarn Testing Machinery.**  
Sipp Electric & Machine Co.

and it is desired to destroy parts of these, this can be done by employing a caustic alkali paste.

Additional effects may be produced by using a fabric, composed say of cotton and woolen threads, in which the cotton threads are one color and the woolen threads another. After treatment, the gauze-like part will only show threads of one color, whereas the untreated portions of the fabric will be composed of a mixture of threads of two colors.

The same process for producing patterns or designs may be employed with fabrics, the fibres of which are all of the same material. In this case some of the threads composing the fabric will be treated, before being woven in the fabric, by a substance which will render them impervious to the action of the destroying agent. The threads so treated may exist both in the warp and the filling and be arranged with untreated threads in any proportion and manner desired, so that when the fabric is subjected to the action of the destroying chemical, the previously treated threads will not be acted upon, while those which have not been treated, will be destroyed as before described, the result being the same as in the previous case, that is to say, the treated portions of the fabric will be of more open texture than the untreated portions of the fabric.

#### A New Process for Dyeing Cotton with Sulfur Coloring Matters, under the Addition of Acids.

This new process, as patented by the Farbenfabriken of Elberfeld, is based upon the known favorable action of dyeing cotton with sulphur colors with the addition of ammonium salts, due to the fact that the same neutralize the free alkali present in the alkaline sulfid dye-bath, and that acids will produce the same result. The acids are generally added to the baths in such quantities that a distinct smell of H<sub>2</sub>S is evolved, but

care must be taken that no dyestuff or leuco-compound is precipitated. The new process is also suitable for dyeing by machinery.

In order to illustrate the new process more fully, the following example is given, the parts being by weight: A dye-bath is prepared from 2000 parts of water, 10 parts of Katigen indigo B extra, 20 parts of crystallized sodium sulfid, 20 parts of Glaubers' salt and 5 parts of soda. To this dye-bath 3 parts of sulfuric acid are added, and 100 parts of cotton yarn are then dyed in this bath at 50 degrees C. for  $\frac{3}{4}$  hour. The dyed goods are squeezed out, exposed to the air and rinsed.

The process is the same for other dyestuffs, and other acids, capable of binding alkali, such as acetic acid, or the like, may be used. The quantities added ought to be sufficient to neutralize the free alkali, but care must be taken not to add an excess, and to avoid the precipitation of the dyestuff.

#### Dissolving Sulphur Dyestuffs.

It has been found that sulphur dyestuffs are easily soluble when mixed with xanthogenic esters of starch. After dyeing or printing, the solvent is removed by washing. For instance, five litres of the ester is heated in a water bath to 100 deg. F., and mixed with 150 grammes of dyestuff. The dyestuff dissolves readily, and the solution is put into the dyebox, and the cotton warps passed through it as in the sizing process. The superfluous paste is removed by a pair of nippers, and the warps are passed over the drying cylinders and on to the beam ready for weaving. When preparing a paste for printing, the xanthogenic ester of starch is first treated with a small quantity of peroxide of hydrogen, which effectively destroys those sulphur compounds which blacken the copper rollers by the formation of sulphide of copper.

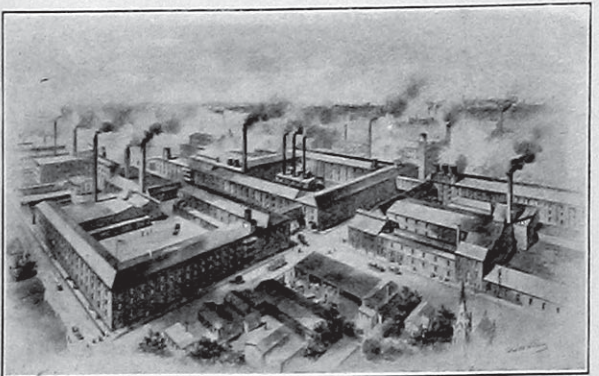
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*The best equipped plant for the DYEING and FINISHING of fine wool and worsted goods, also silk and wool fabrics.*  
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### A Paper Cloth Board.

The object is to construct the board upon which are wound the bolts of cloth, of paper, thus overcoming the objections to which wooden boards are subjected to.

Fig. 1 is a perspective view of the new make of a cloth board, showing also the caps for closing the ends detached. Fig. 2 is a plan view showing another method of winding the paper as forms the board, and Fig. 3 is a cross sectional view of the board.

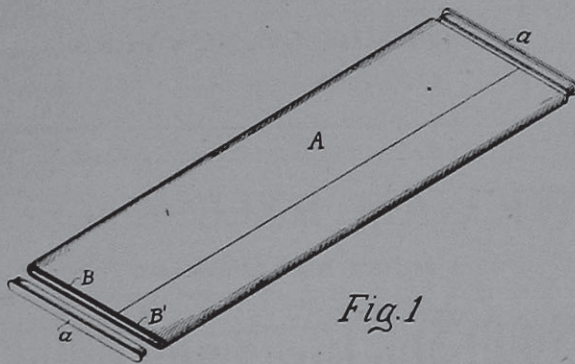


Fig. 1



Fig. 2



Fig. 3

This new make of a cloth board consists of a hollow tubular slab *A* composed of a strip of paper wound upon a mandrel of the proper shape, the successive layers of paper being pasted together during the winding operation, while the board is manufactured. Mounted within the hollow tubular paper slab *A* are two additional hollow tubular paper slabs *B*, *B'*, which are longitudinally arranged and form internal reinforcing members. These latter slabs are wound in the same manner as the slabs *A*, so that the completed slab, *i. e.*, the cloth winding board is a stiff, strong and homogeneous body, free from tendency to crack or split because of the variations in the weather conditions. It is also free from any liability to injury, because of the strain to which it is subjected during the operation of winding the bolt of cloth upon it, and when the ordinary wooden winding board is grasped at its two ends by the clamping devices of the winding machine, whereas the new winding board can be slipped upon a mandrel in the cloth winding machine, and when it is then supported throughout its entire length and cannot be injured by any strain to which it is subjected during the cloth winding operation.

Caps *a* are provided for closing the ends of the tubular slab, making a neat finish for the ends of the

slab, besides providing a convenient surface for receiving the usual marks applied to a bolt of cloth to indicate quality, size, price, etc. The slabs *A*, *B* and *B'* may be produced by winding either a strip of paper equal to the desired length of the slab, as shown in Fig. 1, or by winding spirally a strip of paper, as shown in Fig. 2. Constructing cloth boards of paper as thus described is the invention of Mr. E. Carraine.

### New Color of the Farbenfabriken of Elberfeld Co.

BENZO GREEN C is a new color for the dyeing of loose cotton, yarns and piece goods. It is also well suited for dyeing of half-silk and half-woolen goods, as the different fibres are dyed almost the same depth of shade.

BENZO FAST BLUE 5 R yields a clear reddish blue shade similar in tone to that of the older Benzo Azurine 3 R and Brilliant Azurine 5 R, but is far superior in fastness to light. The color can be employed for all kinds of cotton goods, especially for piece goods, either in self-shades or for shading the older Benzo Fast Blue brands to the red side. It is also well introduced for the dyeing of half-silk, as when dyed in a soap bath the silk is dyed but slightly, without soap, however, both fibres are dyed almost a uniform shade. It has also been favorably received as a combination color in conjunction with wool colors, which dye in a neutral bath, for the dyeing of half woolen piece goods. (Yarn and cloth samples, with full directions for dyeing, upon application).

### SOME SPECIAL COTTON FINISHES.

(Continued from page 254.)

**DHOOTIES.** These goods are finished in several ways: in bleach works, or with firms that do their own finishing they are generally given a pure finish. They are mangled through warm water on a 5-bowl mangle, straight through, dried on the tins, stretched on the strap stretching machine and slightly calendered.

Some finishers give them a little filling. In this case, the process is:—Mangle through hot water on 5-bowl mangle, stiffen with starch with 4 deg. Tw., mangle with wood bowls, dry on the tins stretched, damp on moistening machine, calender on 5-bowl wood bowl soft finish calender without pressure and make up for market. As it is desirable to keep these goods as wide as possible, some finishers dry them on the progressive frame after stiffening.

**MULLS.** Mulls are squeezed through blue water, water mangled on 3-bowl wood mangle, dried on tins, stretched to within an inch of grey width, as a rule, very slightly calendered with never more than 3 nips, folded, pressed and made up. They are not filled, but generally left pure, using at the most, half a can of starch in 6 cans of water.

**TANJIBS.** These are generally finished much after the fashion of mulls, but many merchants require them to have a little more lustre. This is obtained by more pressure on the calender, stiffening

(Continued on page xii.)

**WORSTED YARNS**  
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**National Prosperity**  
**TEXTILE MANUFACTURES**  
 (From Latest Census Reports)

Value wool manufactures, twelve months . . .	\$381,000,000
Value cotton goods . . . . .	450,000,000
Value hosiery and knit goods . . . . .	137,000,000
Value silk manufactures . . . . .	133,000,000
Value Flax, hemp and jute manufactures . . . . .	63,000,000
Dyeing and Finishing textiles . . . . .	51,000,000
<b>Total value textile manufactures . . . . .</b>	<b>\$1,215,000,000</b>

The number is ever increasing.  
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**THE SCHAELLIBAUM GRID**

The grid with a comb is getting in general use all over the country. It does the work. You get better cleaning and lose less cotton in the process than by any other grid. : : : : :

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*and other*

**TEXTILE ECONOMY DEVICES**

*New INVENTIONS in*  
**Mechanical Textile Devices**  
*Developed and Exploited.*  
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**KIP-ARMSTRONG CO.**  
 Pawtucket, R.I., U.S.A.

with corn starch after mangling. The mixing is  $3\frac{1}{2}$  cans starch (dry),  $1\frac{1}{2}$  cans china clay (wet) and water to make 120 gallons.

**NAINSOOKS.** These goods are finished in the same way as mulls, but after mangling in water they are run through a stiffening mangle with a little corn starch and British gum, dried, damped, and heavily calendered, three nips with full weight on.

**WHITE SHIRTINGS.** These are generally given a mangle finish, and, as a rule, left dull, although some are finished bright. The following is the method commonly pursued, but like all other finishes, it is subject to modification at different works:—Mangle through warm water through 8 or 10-bowl water mangle, chase 5 times round, then mangle on a second time mangle, chase 3 times on a mangle having cotton friction bowls, hook, make up, and press.

The mixing for 19 by 21 cloth is 50 lb. starch with  $2\frac{1}{2}$  cans water, 3 cans china clay paste with 4 cans water, 1 quart glycerine, blue to shade. Bright finishes are calendered several times, dull finishes only once.

**FINE SHIRTING.** This is usually done on fine cloths, 19 by 21, 20 by 21, and 21 by 22. Mangle through cold water, dry over tins, beetle for 30 minutes each end, stiffen on 2-bowl mangle, wood bowls, make up from the tins. If a fuller finish is wanted, stiffen on mangle as before, dry over tins, beetle 30 minutes each end, stiffen on 2-bowl mangle, wood bowls, and make up from the tins. If a still fuller finish is wanted, stiffen on mangle as before, dry over tins, beetle 30 minutes each end and damp to feel, make up.

The mixing for 19 by 21, and 21 by 21 cloths is 50 lb. starch,  $2\frac{1}{2}$  cans water, 3 cans china clay, 4 cans water, and 1 quart glycerine, blue to shade. For 16 by 17 and 17 by 17 cloths, 8 cans flour paste,  $5\frac{1}{4}$  cans mineral (wet), 9 cans china clay (wet), and 2 cans water. Boil well.

**CAMBRIC.** Cambric finishes are bright and hard, or in other words, glossy and stiff. The usual process consists in running straight through on an 8 bowl hot water mangle, stiffening on Victoria mangle, but oftener on Scotch mangle, dry on tins, damp, stretch, calender on 10-bowl calender with hot bowl twice through (some first-rate cambric finishers calender 3 times), make up, then press in hydraulic press.

The mixing will vary according to the quality of the goods.

1. The following will be found suitable for fine quality cambrics: Crystal starch 20 deg. Tw. 50 gallons, china clay 4 cans, mineral 2 cans, farina 1 can, blue to shade.

2. For medium quality, Crystal starch 25 deg. Tw. 50 gallons, china clay 4 cans, minerals  $2\frac{1}{2}$  cans, farina  $1\frac{1}{2}$  cans, blue to shade.

3. For common qualities, Crystal starch 25 deg. Tw. 50 gallons, china clay 5 cans, mineral  $2\frac{1}{2}$  cans, farina 2 cans, blue to shade.

**LACE STRIPES.** These are done as follows:—Mangle on water mangle, stiffen, dry over tins, damp calender heavily. Mixing  $2\frac{3}{4}$  cans corn starch (dry), and make to 120 gallons.

**SATIN STRIPES.** These have usually an elastic finish obtained as follows: Mangle on hot water mangle, stiffen on ordinary stiffening mangle, dry on tins, damp, then clamp, afterwards giving them a slight calendering. Use  $3\frac{1}{2}$  cans of starch (dry) to make 120 gallons of mixing.

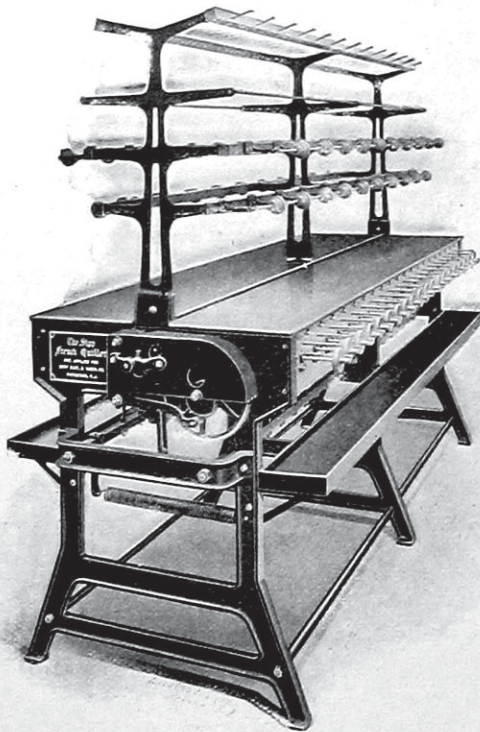
**MUSLIN BROCADES.** Under this head spot muslins and various fancy muslins, with raised patterns may also be included. They are finished as follows: Mangle hot, 5-bowl water mangle without pressure, straight through, stiffen with starch of about 10 to 12 deg. Tw., on Victoria mangle, having only 1 tier of tin and 1 tier of winces, so that the muslins are dried on the back only, then damp calender twice, very lightly and make up.

Some finishers, after calendering, run through what is called a finishing mangle with 3 bowls, 2 sycamore and 1 brass, dry and make up. A better plan is to mangle on 3-bowl stiffening mangle in thin farina liquor about 5 deg. to 6 deg. Tw., dry on the tins, calender slightly, damping well, and dry on the cylinder, face up. This causes the figure of the muslin to be raised and appear as if embossed. The face of the muslin still keeps a little gloss, but the back is generally dull.

**FIGURED DAMASKS.** A similar finish is given to these goods. Mangle warm on 8-bowl water mangle, stiffen in ordinary stiffening mangle, dry on cylinder, and slight calender. The mixing is 3 cans starch (dry), 1 can mineral (dry), make up to 120 gallons of mixing.

**FLANNELLETES.** During the last few years there has grown up a very large business in finishing flannellettes: These are cotton goods, white, self colored, or with colored stripes and checks, with a short nap raised on both sides which gives them the appearance of flannel. They are not as durable, but it is evident from the favor with which the public has taken to them that they will be in the future an important class of cotton goods. These fabrics are finished by a simple process of napping them on a machine specially made for the purpose. The cloth is sometimes run through the machine twice, but some machines are made to raise the pile on both sides at one passage of the cloth, according to the strength of the cloth and the quality of pile required. As the pile is obtained by partial cutting of the fibres on the surface of the cloth, the latter is somewhat weakened in strength, and therefore flannellettes do not wear as well as plain calicoes. However, the feel is softer and warmer to the skin. The pile effect is not very permanent, although there is great variation between different makes of flannellette. In this respect much of the durability of the pile depends on the quality of the cloths used, the stronger and more closely woven the cloth the better they wear. Sometimes flannellettes are dyed and printed after the pile is raised in these cases, as these processes are rather destructive to the pile, only good cloths with a well raised pile can be used.

(To be continued)



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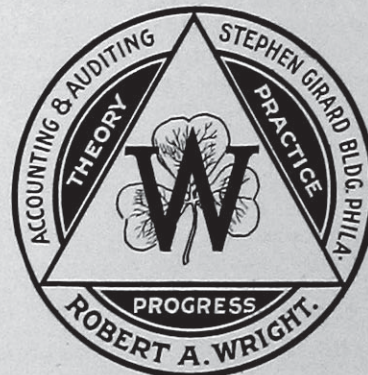
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## TEXTILE WORKER'S BUREAU

**Designer Wanted.** "We want new color combinations and new designs for Jacquard Hammocks, both to be along the lines which make Hammocks salable. Will pay well for our wants if anyone is equal to supplying the same. Do not write unless you have ideas entirely out of the ordinary in color harmony and design. Address Hough Shade Corporation, Janesville, Wis."

**Account Wanted,** of a firm who makes or handles Bed Spreads and Coverlets. We have several men on the road from May 1st to January 1st and would like to add this line to our goods. Address: Cedar Bluff Woolen Co., Cedar Bluff, Va.

**Superintendent for Knitting Mill** in Georgia. To take charge of 100 Latch needle machines on Women's and Children's Ribbed Underwear (Cotton). We require a man who can manage machines, material and help to best advantage. Address only with full particulars: C. K. Co. 12, POSSELT'S TEXTILE JOURNAL.

**Overseer of Carding or Spinning,** including Ring Spinning, Spooling and Winding, or both; or Asst. Supt. Thorough Mechanic, holding a Massachusetts Engineer's License; also understand finishing and warp preparation as well as the construction of plain and dobby looms, having repaired and set them up. Learned all to take Superintendent position. Am at present employed as Spinner in charge of 11,000 spindles; was second hand in Card room previous to spinning. Well up on Waste-question. Have always raised the production where employed. Strictly temperate, American, married and best of references. Go anywhere. W. R. J. 16, POSSELT'S TEXTILE JOURNAL.

**Boss Dyer.** Seven years' experience in Hardening, Fulling, Washing and Dyeing Woolen Felts. Temperate and steady. Go anywhere, prefer the South. G. H. 13, POSSELT'S TEXTILE JOURNAL.

**Asst. Designer or Boss Weaver.** Extensive experience on Fancy Worsteds and Woolens, also on Cotton Worsteds. 32 years of age, single. T. F. L. 15, POSSELT'S TEXTILE JOURNAL.

## MILL NEWS

**Darby, Pa.** The Griswold Worsted Company are erecting a one-story structure, for storage purposes. Out of their 500 employes 400 are now working on full time.

**East Greenville, Pa.** The Columbia Silk Mill and the Eureka Ribbon Mill have resumed operation.

**Le Roy, N. Y.** It is reported that the Le Roy Cotton Mills, which is practically a new company here, and in which considerable local capital is invested, is desirous of increasing its capital stock from \$450,000 to \$750,000 for the purpose of enlarging the plant.

**New York.** Open work hosiery is not "lace wearing apparel." The Board of United States General Appraisers has so decided. The matter came up on the petition of a Western importer who objected to paying duty on openwork stockings as lace wearing apparel, claiming that they should be classed as "hosiery fashioned and shaped," on which the duty is a great deal less. The importer's contention was upheld by the board.

**Utica, N. Y.** The big plant of the International Lace Manufacturing Company at Gouverneur, including its real and personal property, has been sold to Mr. J. J. McCloskey, of Philadelphia.

**Paterson, N. J.** A new silk mill for the Samuel J. Aronsohn Silk Plant is in the course of construction, and will, it is estimated, cost completed about \$45,000. It will be four stories high, 60 x 200 feet, and of fire-proof construction. The boiler room and engine house will be a separate one-story building.

**Plainfield, N. J.** The Glen Rock Woolen Company has been incorporated with a capital stock of \$25,000, to take over the business of the defunct Glen Rock Woolen Mills.

**Hopedale, Mass.** The Draper Company plant is running eight hours a day, five days a week, until further notice. The plant has been running on a schedule of five hours daily, five days a week, for several months.

**Fall River, Mass.** Regular quarterly dividends were paid by the following cotton mill corporations: The Narragansett, 2 per cent; Stafford, 1½ per cent; The Richard Borden Mfg. Co., 2 per cent; and the Weetamee Mills, 1½ per cent. The Corr Manufacturing Company, located in Taunton, 1½ per cent. In each case the dividend declared is equal in rate to the dividend paid the last quarter.

**New Bedford, Mass.** The Potomska Mills are erecting a new weave shed, equipped with all the latest appliances, 299 feet long and 344 feet wide, with a capacity of 2,600 looms. It is proposed to transfer looms from the older buildings to the new, which will permit the management to increase the spindleage of the plant.

**Danielson, Conn.** The Pine Tree Worsted Co., who has leased the Elmville Mill, has commenced operations.

**Meriden, Conn.** The plant of the Silver City Braid Company is running on a daily schedule of thirteen hours. A full force of operatives is employed. The orders on hand have made overtime work necessary.

**Norwich, Conn.** The factory of the Preston Woolen Company, recently erected, is in operation. The concern will manufacture cloth and yarns, the Reliance Woolen Company having contracted to take the entire output. The Reliance Company is said to have on hand enough orders to keep its plant busy for at least half a year.

**South Manchester, Conn.** The Cheney Brothers Co., the largest silk manufacturing concern in the United States, computes that the present production of silk products in the country is now approximately 60 per cent of the capacity of the plants. Their output is now about 80 per cent of the capacity of their plant. The working schedule of several departments has been put on a six-day basis, four-fifths of the big plant is now running on full time.

**Torrington, Conn.** Contract has been awarded for the construction of a new plant of the Warrenton Woolen Co., to have the plant ready for occupancy by October. The plans call for a main factory, a two-story structure, 79 by 321 feet, a one-story dyehouse, 43 by 132 feet, of concrete construction; a two-story storehouse and repair shop, 44 by 144 feet, of brick; and a boiler and engine plant, 57 by 74 feet, also of brick.

**Alexandria, Va.** The Bliss Silk Throwing Company, a Pennsylvania concern, are increasing their equipment and force.

**Burlington, N. C.** Additional capital has been subscribed to the stock of the Whitehead Hosiery Mills, in order to increase the output, by adding modern machinery.

**Burlington, N. C.** The Whitehead Hosiery Mills will increase their capital stock for the purpose of adding new machinery to the present equipment. They manufacture fine-gauge seamless half-hose.



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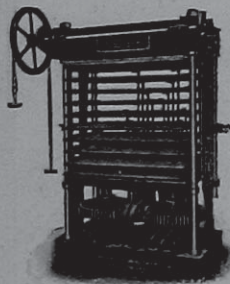
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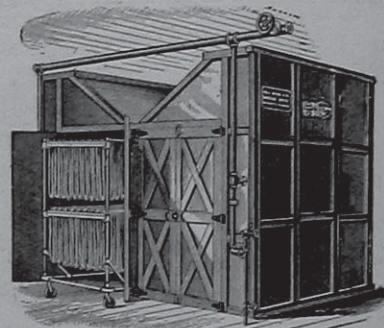
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*Cooleemee, N. C.* The Cooleemee Cotton Mills will erect a building to replace the structure recently burned. The equipment of the mill consists of 40,000 spindles and 1,296 looms, producing mottled and canton flannels, etc.

*Charlotte, N. C.* For the first time in the history of cotton spinning, in North Carolina, the Elizabeth Mill spun 2/100's yarn from Egyptian cotton. In the future the production of this mill will be 50's and 100's.

*Cliffside, N. C.* The Cliffside Mills, manufacturers of gingham, will install 25,000 spindles, in their new building which was recently completed, making a total of 45,000 spindles and 750 looms in operation.

*Flat Rock, N. C.* The Trident Hosiery Mills have commenced operation with an equipment of 75 knitting machines, producing seamless half-hose.

*Weldon, N. C.* The mill buildings for the Shaw Cotton Mills, in the course of construction, are expected to be ready for the machinery early in the summer. It is estimated that the building will cost about \$24,000. The equipment will consist of 5,129 spindles for manufacturing 2/24's to 2/36's yarns.

*Spray, N. C.* The Rhode Island Company are increasing their equipment with 50 wide looms, and are running on full time.

*Fountain Inn, S. C.* The capital stock of the Fountain Inn Mfg. Co., was increased from \$200,000 to \$300,000. To the mill's present equipment of 10,000 spindles and 160 looms will be added 5,000 spindles of the most improved pattern and 300 Draper looms for the manufacture of print cloths. This will necessitate an enlargement of the building. When the addition is completed the mill will discontinue the manufacture of yarn.

*Rock Hill, S. C.* The Arraon Cotton Mills have awarded contracts for new machinery which will double its present equipment. This company is now operating 10,240 spindles and 280 looms.

*Walhalla, S. C.* The Oconee Knitting Mill will increase their capital stock in order to install additional machines to their present capacity of 79 machines, thus increasing their daily production to 500 dozen pairs, of whole and half-hose.

*Atlanta, Ga.* It is reported that the Atlanta Hosiery Mills is to rebuild their plant which has sustained a loss of about \$40,000 by fire.

*Augusta, Ga.* Construction on the new cotton mills at Jesup have begun. Electricity will be used and a 3,000 horse power plant will be erected in connection with the mill, the capital stock of which is \$250,000.

*Augusta, Ga.* Whether or not action is taken by the cotton mills all over the country local mill owners here will not curtail their output, or go on short time, or make any other change in their present arrangements unless they are forced to do so. No notices of reductions in wages have been posted and none will be posted.

*Birmingham, Ala.* The Alabama Cotton Manufacturers' Association have decided not to curtail the output nor to cut wages; manufacturers here considering themselves in a much better condition than New England cotton mills.

*Peoria, Ill.* The Lacon Woolen Mill have now the first looms in the new part of their new mill in operation, and the balance of the machinery will be started as fast as it is ready. The Lacon Mill is now one of the largest in the West.

*Cleveland, Ohio.* The Raven Knitting Company has commenced operations.

# "Textile Designing Simplified."

The object of this chart is to show how easy weaves for all classes of Textile Fabrics can be constructed; it will be a search light in the misty matters in the field of designing Textile Fabrics. Keep this chart of weaves for reference. Millions of new weaves can be obtained by it. All weaves for Textile Fabrics have their foundation in Plain Twills and Satins.

**PLAIN.**—This weave and its sub-divisions are explained on the chart in the top row by 16 weaves, the sub-divisions covering common, fancy and figured Rib and Basket weaves.

**TWILLS.**—The foundation of constructing regular (45°) twills is shown by rows 2 and 3 with twenty six weaves, covering twill weaves all the way from 3 harness up to 13-harness. The sub-divisions of twills are quoted next on the chart, being Broken twills, Skip twills, Corkscrews, Double twills, Drafting twills, Curved twills, Combination twills warp drafting, Combination twills filling drafting, 63° twills, 70° twills, Wide wale twills, Entwining twills, Checker-board twills, Pointed twills, Fancy twills, thus covering every sub-division of twill weaves possible to be made.

**SATINS** are next shown, giving also their sub-divisions, viz: Double satins and Granites. **HOW TO PUT A BACK FILLING ON SINGLE CLOTH** is shown below the satins by two examples, and at its right hand is quoted the principle of **HOW TO PUT A BACK WARP ON SINGLE CLOTH.**

On the bottom line are given the four steps for:—**THE CONSTRUCTION OF DOUBLE CLOTH, 2 @ 1;** and above the same one example, with the arrangement **1 @ 1.**

**THREE PLY CLOTH** is shown by one example. **HOW TO BACK SINGLE CLOTH WITH ITS OWN WARP** is shown by two examples. **WEAVES FOR SPECIAL FABRICS** are quoted: Tricots (warp, filling and Jersey effects), Rib fabrics, Honeycombs, Imitation Gauze, Velveteen, Corduroy, Chinchillas, Quilts, Plush, Double Plush, Tapestry, Crape, Terry, Worsted coating stitching, Huckes, and Bedford cords.

## HOW TO WORK THIS CHART OF WEAVES.

**CAPITAL LETTERS** of references refer to the plain weave and its sub-divisions. **SMALL LETTERS** of references refer to twills and their sub-divisions. **NUMERALS** of references refer to satins and their sub-divisions.

**Example.**—How to ascertain the construction of the weave at the right hand top corner of the chart; being the figured rib weave marked C C? These two letters of reference mean that said figured rib weave is nothing else but the combination of the 2-harness 6 picks common rib weave warp effect C, and the 6 harness 2 picks common rib weave filling effect C'.

**Example.**—The letter of reference *c*, underneath the first broken twill indicates that the same is obtained from the  $\frac{1}{2}$  4 harness twill *c*, (third weave on the second row; in other words, letter of references below each weave of any of the various sub-divisions refer always to the corresponding foundation weave.

**Example.**—Twill *q* and *o*, are the foundation for the eight combination twills filling drafting, said common twills are drafted **1 @ 1**, the different designs being obtained by means of different starting.

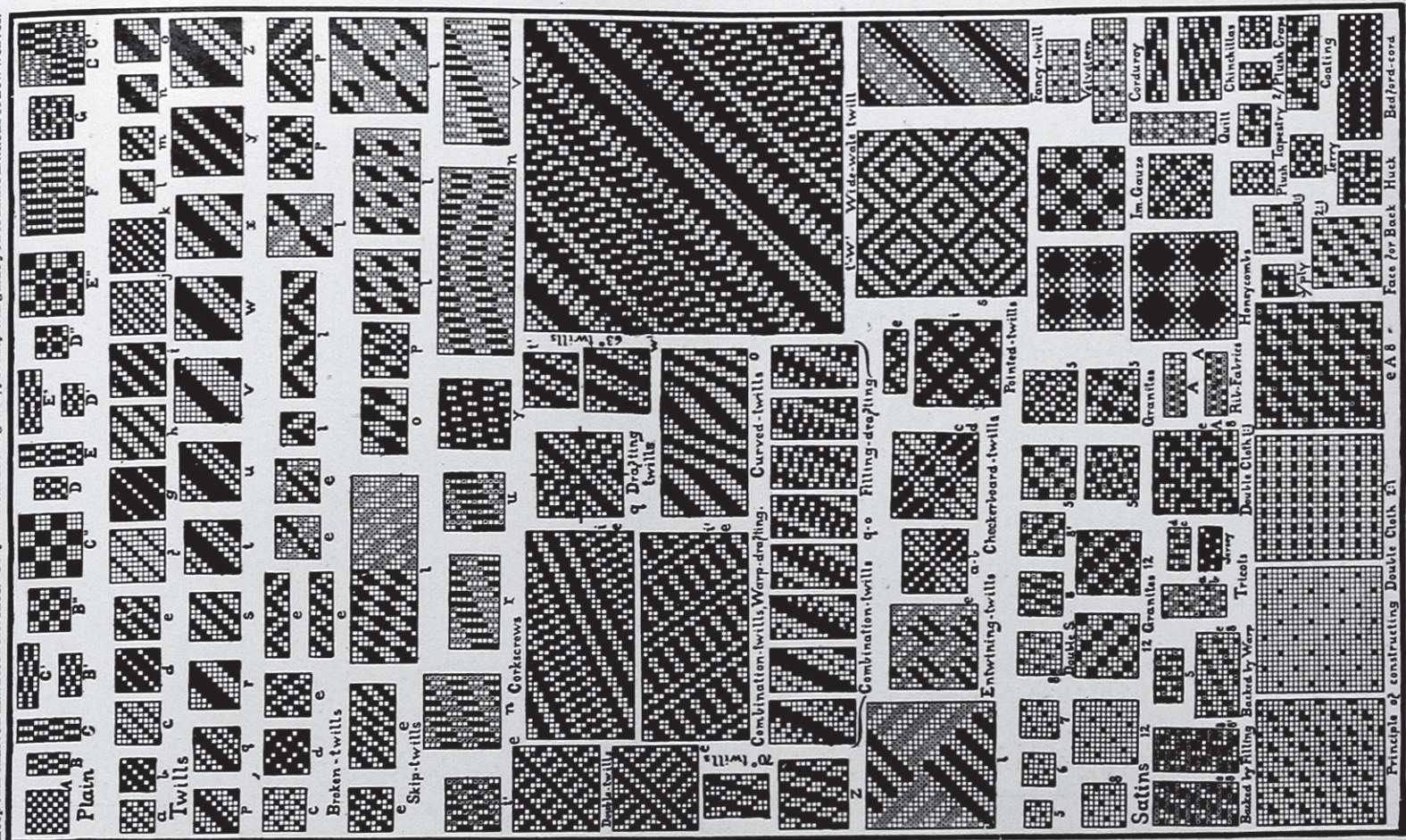
**Example.**—The wide wale twill *w'*, has for its foundation the 63° twills, marked also respectively *l'* and *w'*, the latter two weaves have again for their foundation respectively the common twills marked *l* and *w*.

**Example.**—Granites marked 8 have for their foundation the 8-leaf satin, such as marked 12 the 12-leaf satin.

**Example.**—Backed by filling *e* 8, means the common  $\frac{2}{2}$  4-harness twill *e*, (fifth weave on second row) and the 8-leaf satin is used in the construction of this weave.

**Example.**—The complete design of double cloth, marked *e* 8 A, means that the common 2-4-harness twill (*e*), the common plain (A) and the 8-leaf satin (8) are used in the construction.

**Example.**—Rib fabric A, indicates that the plain weave forms the foundation. It will be easy to substitute different foundations in constructing weaves for heavy weights. In reference to single cloth weaves we only want to indicate that by following rules shown in the chart, millions of new weaves can be made up from it.



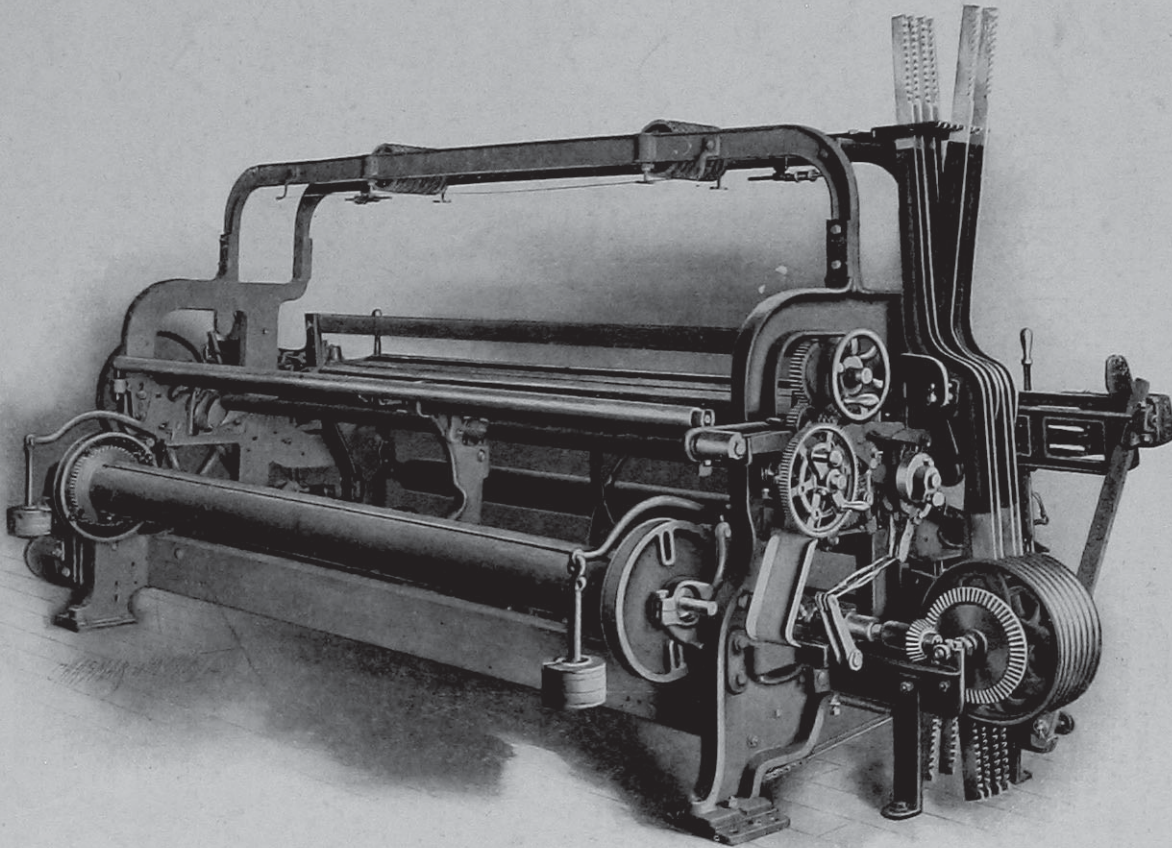
Principle of constructing Double Cloth 11

e A 8

Face for Back

Huck Bedford-cord

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