too hot a scouring liquor. To prove this theory subject a sample of wool to superheated steam or water and when it will be reduced to a discolored pulp. The scouring agents used may also be at the bottom of the trouble, since if using a fixed alkali of too great a strength, the fibre will not only become discolored but at the same time weakened; the wool fibre being very sensitive to the action of strong alkalies, as previously referred to, more particularly being this the case when the scouring liquor is used at an excessively high temperature.

With reference to the stock coming from the bowl, or the dryer, in a matted condition, this has been the result of extra violent agitation in the scouring bowl, more particularly, when swing rake or old styles of scouring machinery is used. To obtain production, a mill may push the process of scouring too much, accomplishing this by means of severely agitating the wool under treatment, with the consequent result of matting the stock in the procedure. This trouble has been the cause of much study by the *James Hunter Machine Co.* who make a specialty of modern built wool scouring machinery, and indirectly may have been the cause of their new *Model D Parallel Rake Machine,* a machine which gives as mild an agitation as possible to the wool, while it is passing through the scouring liquor and in turn reduces the chances for matting or felting, to a minimum, if not making it impossible.

Loss in natural elasticity with its consequent loss of spinning properties to the fibre, is caused by overheating and the use of too strong alkalies; both will not only discolor the fibre, as previously referred to, but at the same time ruin the serrations of the fibre and in turn destroy its strength and natural elasticity.

Having thus far treated the technical subject of wool scouring we will now take up the machinery part, *i. e.,* the mechanical appliances used for the process of wool scouring and which are of the greatest importance, since the result (a clean lofty wool, scoured at lowest cost) depends equally as much upon the proper make of a machine used, than upon the scouring agents, heat, water, etc., employed, as well as the time allowed for the process.

Wool scouring machinery has undergone great changes in its construction during the last 50 years, *i. e., from Hand-Work to the present Parallel Rake Machine,* and if the writer thinks back of the various styles of wool washing machinery in use, beginning with the early 70's, the stringy, rope like, matted condition, the wool was then delivered from the machines, as compared to the lofty condition it is delivered at present by the *Parallel Rake machine,* the improvements become so much more pronounced.

In some instances we may yet find in mills machines known as *Swing Rake machines,* a machine of somewhat older construction, and in which the wool is passed through a long bowl, fitted up with swing rakes, which agitate and pass the wool quickly through the scouring liquor and up to the lifting apparatus, and so further forward up to the squeezing rollers. The agitation given by the swing rakes assists in loosening and getting out the sand and dirt and other extraneous matter while the wool is passing through the scouring process. This machine, if in a mill, however, only should be used for wool not liable to be injured by the agitation in the scouring liquor, although the difficulty can be somewhat overcome by moderating the speed of the rakes. However, we must remember that the wool in the scouring bowl is always considerably distributed by swing rakes during its passage through the scouring liquor, a feature which always has a tendency to more or less felt the fibres, and which should be obviated. Wool scouring being more of a chemical than a mechanical operation, it is thus desirable to bring the scouring liquor into contact with the wool with as little mechanical disturbance as is possible. The swing rakes always more or less act to thus disturb the wool, hence the disadvantages of this machine, and more particularly when dealing with wools which easily felt.

This trouble, however, is overcome with the *Hunter Parallel Rake Machine,* and where a series of rakes, formed into a rake frame, are made to move very slowly through the scouring liquor, thus passing the wool through the machine in a gentle manner, in bulk, without agitation or disturbance. Arriving at the delivery end it then passes between conveniently located squeezing rollers and in turn out of the machine.

Previously to subjecting wool, as coming from the sorting room, to the scouring process, the same is in some mills *dusted, picked* or *opened* as it may be variously termed; whereas other mills object to this process, claiming that it breaks the staple and besides this allows the wool to felt in the scouring process. To a great extent it depends upon the character of the wool under operation, and when with our better grades of wools, whether washed or not washed, this dusting is not necessary.

Unwashed wools, loaded with sand, will be more readily scoured if first dusted.

Carelessly washed wools (washed on the sheep's back previously to shearing) may have been somewhat felted, and when dusting will help the scouring process. It will break some of the staple, but this would be the case anyway at carding, later on.

If having to mix washed and unwashed wools in the scouring process, dusting them first will be of advantage, since they then get more thoroughly mixed. Pulled wools should be always dusted, so as to get rid of the lime, dust, etc., as much as possible, previously to the scouring process.

(To be continued.)

Philadelphia has 314,000 homes; 55,000 separate business organizations; 16,000 manufacturing plants, covering a range of 300 separate lines of manufacture, employing a quarter of a million of skilled laborers.

FROM THE BOSS DYER AND FINISHER OF ONE OF OUR LARGEST WORSTED MILLS.

E. A. Posselt:—I have handed this month's Journal to our Gen'l Supt. for examination; he was very much pleased with your article on Selvedges. . . . . . .
H. R. 3-16-09.

FULL AUTOMATIC SEAMLESS KNITTING MACHINERY.

The most prominent make of this type of knitting machinery in the market is the one built by The H. Brinton Company, of Philadelphia, and which we have for this reason selected for use in illustrating our article. It is a machine met with all over the world.

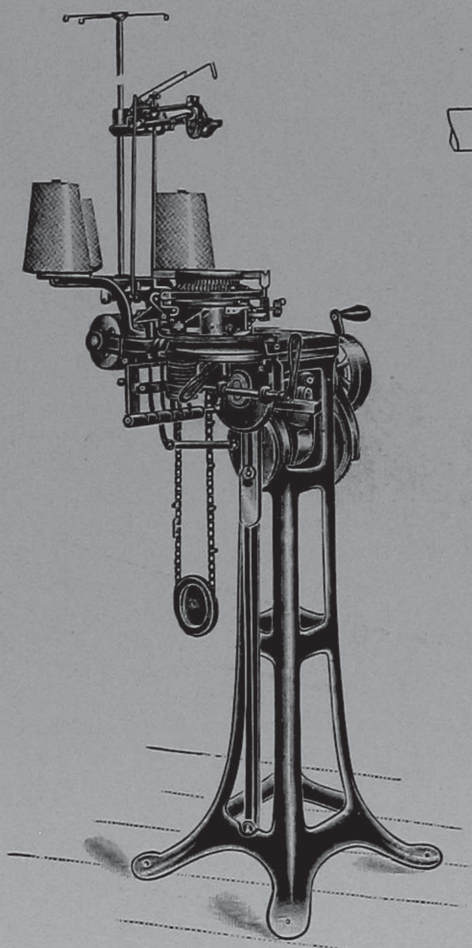


FIG. 1.

In England this machine is known as The *"George,"* and is quite a favorite abroad.

The machine, in itself, is undoubtedly the embodiment of simplicity to treat of from a technical standpoint, as all changes are affected from a drum which is situated in the rear of the machine and conveyed direct, through the intermediary of simple levers, to the parts which act upon the needles. The racking of the drum is affected by a pawl which is only brought into action when a stud appears on the pattern chains, the latter of which is racked continuously. The drum is always racked a definite part of its circumference. Only one height of stud is used.

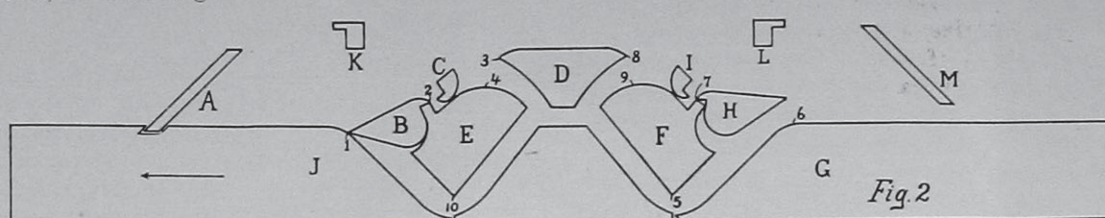


Fig. 2

In order to be able to give a thorough explanation of the construction and operation of this celebrated *"Brinton Full Automatic Seamless Knitting Machine,"* the accompanying three illustrations are given and of which Fig. 1 shows the perspective

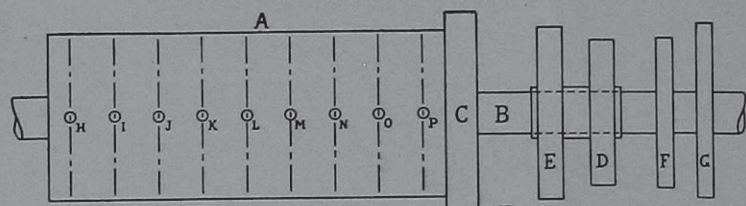


Fig. 3

view of the machine; Fig. 2 the development of the cylinder cam, shown in outline; and Fig. 3 a diagram of the pattern drum.

Only one set of needles is employed, *i. e.,* the cylinder needles. The dial needles, as used in rib machines, being in this machine replaced by sinkers, one sinker taking the place of each dial needle. These sinkers are used to push the stitches away from the needles, after they have been cast off by said needles, and also to hold the work down.

This machine is used to complete the knitting of half hose after the tops have been made on the Rib Top Machines, and also to make stockings, in the latter instance requiring no tops from the Rib Top Machine.

IN ORDER TO KNIT HALF HOSE, the tops are first placed on the cylinder needles, the clyinders carrying the needles being easily removable from the machine so that a top may be placed on one cylinder while another is working. The end of the rib top containing the slack course is placed on the needles, each loop being placed over a cylinder needle. The cylinder is then ready to be placed in the machine, being placed over a binding ring which secures it in the machine. This is known as locking the cylinder and is done by simply pulling a lever up. In order to place the raised needles down into the cylinder cam groove, which were raised in order to allow the needle cylinder to be placed in the machine, a jack cam for pulling down said needles is thrown inwardly so as to act upon them. The needles by thus being lowered, are placed in their working positions and the machine is then ready to start.

The plain stitch is first made by continuous circular knitting in one direction until the heel has to be knitted.

The heel is made by giving the cam cylinder a reciprocating motion, that is, one revolution in a right hand direction and then reverse the direction of motion for the next revolution. In this manner only one-half of the needles work, the remaining half being raised out of working position, thus producing the fullness for the heel. The heel is shaped properly by raising a needle out of action from each side of the working needles after every course, until the smallest part or bottom is made, then a needle is added at each end until the heel is finished. After completing the heel, continuous knitting is made until the toe has to be made, the remaining needles having been lowered.

The toe is made in the same manner as the heel, and on its completion the machine is automatically stopped, so that the operator may replace the empty cylinder with a new one containing a half hose top.

To make the plain stitch on the machine, the cylinder needles are raised successively by the cylinder cam in order to have the stitch in each hook open the latch and allow new yarn to be put in said hook when the needles descend. The sinkers are also moved in and out during a course by means of a cam groove on the dial cap.

The yarn carrier as used in this machine consists of a ring shaped piece situated above the dial cap and having a hole in the side through which the yarn is passed. The ring also acts as a guard for the hooks of the needles which are partially raised when in the resting position. The hole in the yarn carrier is made in the same vertical line with the central point of the centre cam on the cylinder cam and the outward point of the dial cap cam, although this cam is given a little play on either side of the carrier eye. This causes the yarn to be deposited on the sinkers when the needle is up and the sinker is partly out of the way. As the needle comes down, the yarn catches in the hook and is drawn down; at the same time the sinker moves inwardly and pushes the cast off stitch away from the needle.

The cylinder cam is made with a needle rest for a little over half of the inner circumference of the cam.

The dial cap cam is made to have all of the sinkers in an inward position except a few where the yarn carrier is depositing yarn, and which are in the outward position, that is, the part which pushes the stitch inwardly is in this position.

To make the heel, the same plain stitch is made, but only part of the needles are used. A reversing motion for the cam cylinder, as was mentioned, is brought into action in order to give one revolution in one direction and then reverse the motion for one revolution.

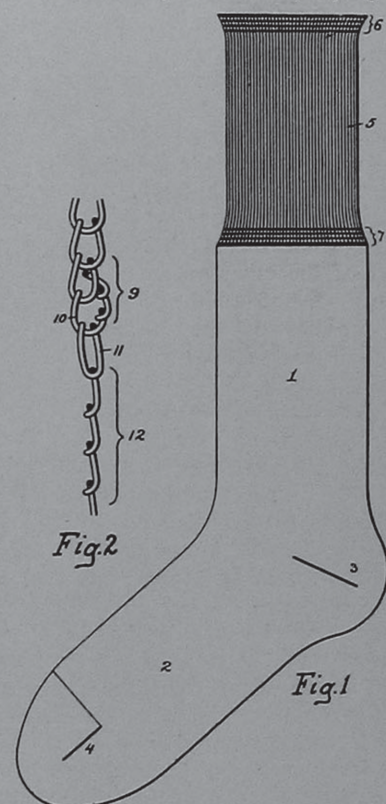
The cam cylinder is driven from a bevel gear which in turn receives its motion from either of two sources through a clutch. When the clutch is in contact with a continuously revolving piece, the cam cylinder is revolved in one direction, and when the clutch is in contact with a piece which receives a forward and backward revolution, the cam cylinder is consequently given a similar movement. The continuous revolution is gotten directly from the driving shaft of the machine. The backward and forward motion is gotten through a toothed segment which is given a backward and forward movement through a crank pin as driven from the driving shaft of the machine.

(To be continued.)

A NEW RIBBED TOP FOR HOSE.

The object is to knit a ribbed top on the leg of a plain knitted full or half hose in such a manner so as to prevent excessive stretching of the ribbed web and consequent eventual loss of its elasticity.

In order to give a thorough description of the knitting of this new top the accompanying two illus-



trations are given and of which Fig. 1 represents a knitted sock having such an improved top; Fig. 2 being an exaggerated sectional view of the stitches in that portion of the sock where the plain leg joins the ribbed top.

To accomplish this result, one or more welt courses are formed in the ribbed top, just above the junction of the same with the plain web leg, and when undue stretching of the ribbed web will be prevented, the ribbed top preserving its elasticity for a much longer time than in the absence of such preventive means.

In Fig. 1 of our illustrations, numerals of reference 1 represents the leg of the stocking, 2 the foot, 3 a seamless heel, and 4 a so-called seamless toe. 5 represents the top, composed of ribbed tubular web, having at its upper end a series of welt courses

6, and just above the junction of the ribbed top with the plain foot another series of welt courses 7. These so-called welt courses are produced by arresting the knitting operation upon one of the sets of needles with which the rib knitting is provided, continuing to knit one or more courses of stitches upon the other set of needles of said machine, and then resuming the knitting of ribbed web.

The ribbed tops are knitted in succession in long webs, and adjacent to each welt course or series of welt courses, there is what is termed a *slack course* produced by drawing longer stitches in said course than in the others, this slack course being the one which is transferred to the needles of the plain machine upon which the leg and foot of the stocking are knitted, the lengthening of the stitches in said slack course being intended for the purpose of facilitating such transfer.

The ribbed web is severed at points between the slack and welt courses, so that in each ribbed top thus produced, the welt courses are at the upper end and the slack course at the lower end.

In Fig. 2 of our illustrations, 9 represents the stitches produced upon one set of the needles of the rib machine, while the stitch 10 is being held upon the needles of the other set. 11 represents the long or slack course, and 12 the plain courses produced upon the needles of the machine to which said long or slack course of the ribbed web has been transferred.

Japan's Knitting Industry. In Osaka alone there are about 1,300 manufacturers of and dealers in knit goods. Of the total import of knitted goods to India about 60 per cent. is now already from Japan. The popularity achieved by the Japanese knitted goods is attributed to the excellent machines used and to the skill of the workmen.

In Japan a special machine has been invented by manufacturers. At the price of one German machine, five or six Japanese-made machines can be purchased, while the Japanese machine turns out about twice the quantity of work produced by German machines—namely, 5 kwamme a day (a little over 8¼ pounds), against 2½ kwamme. As to the knitting, a Japanese can produce three times the quantity produced by an Indian. The only drawback of the Japanese work is that it is inferior in quality when compared with that produced by German machines.

The Japanese now have their eyes directed to Egypt, where the raw material is abundant, and Japanese dealers see a good opportunity for extending their commercial influence in the whole of this territory.

The latest "*score*" in textile circles in Nottingham, Eng., is poisonous stockings, and the case of a girl who "wasted away" and lost the power of walking, through wearing yellow stockings, found to be weighted with chloride of tin is cited as an example of the dangers that beset us in this world of trials and pitfalls.

BLEACHING AND DYEING ARTIFICIAL SILKS.

By V. Clemens.

(*Continued from page 75.*)

The Bleaching.

Artificial silk is bleached by alternating treatment with sodium hypochlorite NaClO and hydrochloric acid HCl without any intermediate rinsings. Permanganate and sulfite will weaken the fibre more than if using chloride. Alkaline baths alternating with those of hypochlorite, as well as reducing bleaching agents are not suitable for the bleaching of artificial silk.

The bleaching of artificial silk must be done quickly since even the action of weak (dilute) bleaching baths, if subjected to them for any length of time, will weaken the fibre. Cuprate silk bleaches rather easily, acquiring in the process a characteristic milky lustre.

The Dyeing.

At this process care must be taken not to injure strength nor lustre of the yarn. In connection with such yarn as destined for the manufacture of fringes, trimmings and similar fabrics, fastness to light is required. Fastness to washing does not come under consideration, for the fact that artificial silk can not be washed.

Fast dyes as used in connection with cotton dyeing, like mordant dyes, indigo, aniline black and the non-soluble azo-dyes, are not used in connection with the dyeing of artificial silks; sulphur dyes being only employed in special cases, for instance, in connection with dyeing artificial horsehair. In opposition to these, the basic dyes, which at present are of minor importance in connection with cotton dyeing, are well suited for dyeing of artificial silk. Amongst these are the *Janus* dyes, of the Höchster Farbwerke (H. A. Metz and Co., New York), and which are products intermediate between basic and the substantial dyes, and the *Seto* dyes which resemble acid dyes. The *Ciba* Dyes of the Society of Chemical Industry—A. Klipstein & Co., New York—are a modern class of dyes also well adapted for the dyeing of artificial silk.

The *Janus* dyes produce upon Collodionsilk, minus previous mordanting, colors fast to water and dye Cellulosesilks, the deepest shades, direct. The *Seto* dyes, like Seto Glaucine and Seto Cyanine, are characterized by means of easy levelling, although being not extra fast. The same as the other basic dyestuffs, Seto dyes will dye Collodionsilk in its darkest shades direct, but Cellulosesilk only in medium and light shades.

For dark shades, a tannin mordant must be first used, provided fastness to water is desired. This tannin bath must not be too strong or the feel of the yarn will suffer. Leave the yarn, at the most, from 1 to 2 hours in the tannin bath, wind it slowly out of the bath and subject it in turn for 10 minutes to cold tartar emetic. To reduce the affinity of the tannin mordant upon the fibre, the mordanting bath is slightly heated.

A whole series of acid dyes, serve for the dyeing of artificial silk, amongst them being: Quinoline Yellow, Victoria Yellow, Orange No. 2 and No. 4, Metanil Yellow, Brilliant Orange, Brilliant Croceine, Phloxine, Acid Rosamine, Fast Acid Violet, Water Blue, Patent Blue, Erio Glaucine, Erio Cyanine and Acid Violet. These dyes are used for light shades, for bright reds, fast to light but not to water. Although the affinity of acid dyes to artificial silk is not pronounced, they clearly show the stripes the latter contains and when it will be of interest to note that incompletely denitrated Collodionsilk will fix acid dyes fast to soap, whereas such as is fully denitrated will not do this. Considered in a general way, the behavior of Collodionsilk and Cellulosesilks to acid dyes is the same.

Janus dyes, basic and acid dyes are used in the same way. The goods are soaked in lukewarm water, entered in a cold bath containing acetic acid or alum, after which the dyestuff is added, and the silk dyed for one-quarter hour cold and for half an hour at from 50 to 60° C., after which rinse, squeeze out carefully or hydroextract. When dyeing with Janus dyes and basic dyes Collodionsilk or artificial silk mordanted with tannic acid, to prevent too rapidly absorbing, the dyestuff must be added in small quantities at different times, and at the same time be carefully warmed.

Substantive dyes are dyed for about three-quarters of an hour with a little common salt and carbonate of soda, at a temperature varying from cold to 60° C. Soap is a most useful addition to the bath since it prevents breakage to the thread on account of making the fibre supple, however it does not prevent the streaky appearance of the fibre, previously referred to.

Substantive dyes are not suitable for dyeing Navy Blue, the dyes to use being Janus Blue, Indophene Blue, and Methyl Violet, the result being a more even color.

Sulphur colors are used in a cold bath containing sulphide, carbonate of sodium, as well as a little chloride. Brown and fancy sulphur dyes can be used with satisfactory results, whereas blues and blacks are apt to spoil both the lustre and the feel of the silk.

Dyeings with acid dyes, basic dyes without previous mordanting, and direct dyeing on Cellulosesilk and Janus dyes are not fast to water, whereas most of the substantive dyes, Janus dyes on Collodionsilk or on tannin-treated Cellulosesilk are however fast to water. The other basic dyes only produce colors fast to water upon tannin-treated silk. Dyed artificial silk is less fast to light than cotton dyed similarly.

Not all dyes of the groups quoted are equally well suited for the dyeing of artificial silk, the following being a list of the best dyes, arranged under the heads of the colors.

Black: First, Janus Black which produces the best color. Second, some of the cheaper substantive black.

Navy Blue: Janus Blue R., or Indone Blue, shaded with Methyl Violet.

Brown: New Toluylene Brown.

Red: A mixture of acid dyes, or with Benzopurpurine.

Pink: Acid Rosamine, Phloxine or Rhodamine on tannin antimony mordant.

Orange: Substantive Orange, Brilliant Orange, Orange No. 2.

Yellow: Janus Yellow, Quinoline Yellow, Victoria Yellow, Cotton Yellow N.

Green: A Basic green with Auramine; for light bright shades use Patent Blue and Quinoline Yellow.

Blue: Methylene Blue, Water Blue, Seto Glaucine, Seto Cyanine, Diamine Pure Blue FF.

Violet: For light shades use Fast Acid Violet; for dark shades Methyl Violet.

Grey: Acid Dyes.

(1) How to Distinguish True Silk from Artificial Silk.

The same are readily distinguished from each other by most any person who has come in contact with them; the following being tests which will solve the problem.

(*a*) Wet the thread on your tongue and when artificial silk will break easily, whereas true silk will not be influenced, *i. e.*, remain a strong thread. This test will leave not the least doubt possible.

(*b*) Burn the thread; true silk (characteristic to animal fibres) will only smolder, whereas Cellulose and such silk as having the same as its basis, will burn with a flame, to the end of the thread.

(*c*) The microscope will readily distinguish the two kinds of silk, artificial silk being not only of a larger diameter, but at the same time presents a totally different picture.

(2) How to Distinguish the Various Artificial Fibres.

(*a*) Place sample to be tested into a solution of Diphenylamine in concentrated sulphuric acid, and when Collodionsilk (although well denitrated) will give the blue nitric acid reaction.

(*b*) Dye sample with a basic dyestuff, when Collodionsilk will take dark, whereas Cellulosesilk, no matter how much dyestuff is used in the bath, will only take medium.

(*c*) Treating with Schiffs Reagent, Collodionsilk will take a dark pink, Viscose a pronounced lighter pink, and Cuprate silk a still lighter shade.

(*d*) The Sections of artificial silks viewed under the microscope vary; Collodionsilk, the same as any artificial silk obtained by means of a volatile solvent, appearing bean-shaped. The section of artificial silks obtained from watery solutions, when a single fibre spun, is irregular, whereas if bunches of fibres are spun and twisted direct, their sections are polygonals, mostly five cornered; Viscosesilk will present sharp corners, Cuprate silk somewhat rounded corners. This peculiar shape is caused by the fibres remaining soft at the spinning by the pressure of the threads against each other.

Threads having gelatine and caseine for their basis are nearly round, caused by the quick hardening and consequent proportionally smaller shrinkage.

(*e*) Acetatesilk is distinguished in that the same is hard to wet out; such silk containing a great amount of combined acetic acid, which after saponification of the Cellulose-ester can be shown.

(*f*) Silks having gelatine and caseine for their basis, burn like true silk, and can be dissolved in alkalies.

Reactions quoted will be sufficient to distinguish the nature of most any kind of artificial silk we may come in contact with; Cuprate silk and Viscose being the only ones that may present difficulties, since their reactions are closely related to each other.

Bleaching Cotton Yarns with Peroxide of Sodium.

When it is necessary to bleach cotton yarns a beautiful white, peroxide of sodium is the bleaching agent par excellence to use, vastly superior to bleaching powder.

The bleaching process may be carried on in a vat of white wood, stoneware, or enamelled metal. No metal except lead can be allowed to come into contact with the bleaching liquid, hence the heating coils for warming the liquid by indirect steam must be of lead.

If the peroxide of sodium bath is not to be used at once, it must be made just acid to litmus paper with dilute sulphuric acid; but if to be used at once, it must be feebly alkaline, as shown by litmus with ammonia. The bleaching temperature is to be kept at from 122 to 131° F. The time required varies from three to ten hours, or even more, if dealing with brown Egyptian yarn. The material must be well scoured and then rinsed before bleaching. It must lie rather loose in the liquid, so that the latter has free access to every part of it.

A good plan for quickly bleaching yarns, and one which permits of several lots being treated readily, one after another in the same bath, is to lift each lot as soon as it is thoroughly soaked, wringing it lightly back into the bath, till it retains only about its own weight of liquid, laying it then in a warm place for some hours, turning it over occasionally.

The strength of the bath to use, depends upon the degree of resistance offered by the cotton to the action of peroxide. An average bath may be made up thus:

Peroxide of sodium	8	lbs.
Concentrated sulphuric acid	10	"
Phosphate of soda	$\frac{1}{4}$	lb.
Water	100	gal.

The bath is kept standing, and reinforced, as may be necessary, with about 10 gallons of water, 3 lbs. of sulphuric acid, and 2 lbs. of peroxide of sodium at a time. (Leipziger Färber Zeitung.)

The dyer should know exactly what treatment in the way of finishing, the goods he has to handle must pass, after leaving his hands, so as to be able to select suitable dyes and processes. What can be done with dyes can be realized when we take into consideration that the Gobelins Manufactory at Paris dyes about 40,000 different shades with six artificial dyes.

Manchester's (England) export of cotton goods in January as compared with that of last year and 1907 fell off over 100,000,000 yards, or a value of nearly $10,000,000.

TESTING OF CHEMICALS AND SUPPLIES IN TEXTILE MILLS AND DYE WORKS.

(Continued from page 61.)

PART II.

General Method of Testing. Operations Required, Results to be Secured, etc.

This article will explain the various operations used in chemical analysis, and will give them their technical name. It is very important that the reader should become familiar with these terms, for they will be mentioned frequently in the course of this article. One of the most frequent operations employed in analysis is solution.

Solution is the dissolving of the substance (a solid, liquid or gas) into some liquid, known as the *solvent*. The resulting mixture must be a clear homogeneous liquid.

There are two kinds of solution, physical and chemical.

Physical solution is a simple mixture of the substance dissolved, with the solvent. The substance dissolved can be obtained again in its original condition by getting rid of the solvent. This can be illustrated by dissolving a tablespoonful of salt (the substance to be dissolved) in a glass of distilled water (the solvent). A clear solution is obtained. If the solution is allowed to stand several days the water will evaporate and salt will remain. The salt which remains will be the same in quantity and quality as that which we put into the glass.

In a *chemical solution*, the substance dissolved is changed by the solvent, which also undergoes a change. This can be illustrated by dissolving a piece of marble in hydrochloric acid. Bubbles of a gas are given off, and if there is enough acid present, all the marble will dissolve. If this solution is evaporated, the marble is not recovered, another substance remains, which is very different from marble, both in appearance and chemical composition. The substance which remains (calcium chloride) can be dissolved in water, while marble cannot be dissolved in water; calcium chloride contains chlorine, marble does not.

As a rule it may be stated that when a substance dissolves in water, or alcohol, a physical solution results; but if an acid or an alkali is necessary to dissolve the substance, the resulting solution is a chemical solution.

A solution of a substance is said to be *saturated* when the solvent cannot dissolve any more of the substance. This solution is also known as a *concentrated* solution.

As a rule, solution takes place more readily if the solvent is heated, *i. e.,* hot water dissolves sugar more readily than cold water.

As a rule solutions are made in beakers or flasks which are placed in a sand bath, the sand bath is heated by a gas burner.

Solution takes place more readily, the greater the surface of contact between the solvent and the substance to be dissolved. The latter therefore should be very finely divided, because a finely divided substance presents more surface than a solid substance. The solution moreover should be frequently stirred.

To sum up, the conditions best suited for making a solution are as follows: The solvent should be heated, the substance to be dissolved should be in the form of a very fine powder, and the solution should be frequently stirred.

In preparing a solution from organic substances which are only partially soluble, for example the coloring matter in logwood, the substance is bruised and macerated and kept in contact with the solvent for a long time, and the liquid is then strained off. When this process is carried out at ordinary temperatures it is called *infusion;* when heat is required for the solution it is called *decoction.*

PRECIPITATION. The reverse of solution is precipitation, which is used frequently for the purpose of separating substances, which then can be collected in a convenient form, and weighed. Like solution, it is of two kinds, *physical* and *chemical.*

Physical Precipitation is brought about by altering the solvent in which a substance is dissolved, and can be illustrated in the following manner: Make up a salt solution, to the clear solution add a little alcohol, a white substance separates out (precipitates). This substance is salt. Salt is soluble in pure water but it is insoluble in water containing alcohol, which is the reason it is precipitated when alcohol is added. The salt is not changed.

On the other hand, chemical precipitation involves a change in the substance dissolved. If, to a salt solution, a solution of silver nitrate is added, a white curdy mass is obtained. This white mass is neither salt nor silver nitrate; a new substance (silver chloride) has been formed. This substance which is insoluble in water separates out and is called the precipitate.

Precipitates have different appearances; some are crystalline, some curdy, some gelatinous, etc. The nature of the precipitate together with its color, helps to identify the substance. This identification must be confirmed by special tests.

Precipitation is best effected in beakers and test tubes, specimens of which are shown in Fig. 4, and where diagram *A* shows two sizes of test tubes, *B* shows a beaker, and *C* and *D* two styles of test tube holders.

In analysis, the principal points to be attended to are: The conditions under which a reagent is to be applied (for instance, the temperature), and the alkalinity or acidity of the solution, which should be known.

When the quantity of a substance tested for by precipitation is very minute, it may happen that no visible precipitate is formed on the addition of the reagent, but this must not at once be taken as a negative indication; the tube must be allowed to stand some hours and then examined. If no precipitate is yet visible, the liquid should be shaken, heated, or perhaps evaporated somewhat, and again examined when cold. In some delicate experiments a neglect of these precautions will involve error.

In quantitative analysis, where it is essential that there should not be the slighest loss, either of precipitate or of the liquid from which it is thrown down, beakers are the most convenient vessels for precipitation, because, when collecting the precipitate for weighing, any particles adhering to the sides may be more easily detached by means of a feather, stripped bare with the exception of a tiny tuft at the end, and washed out by a fine jet of water from the wash bottle. When this is ineffectual, the adherent particles must be dissolved off, and again precipitated. Glass rods, used for stirring, must always be washed before removal from the vessel containing the precipitate.

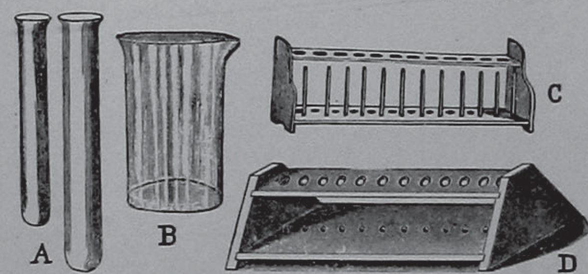


FIG. 4.

Sometimes it may be desirable to use only just so much of a reagent as will completely precipitate the substance to be removed from the solution. In such cases, great caution must be exercised, and the liquid frequently cleared, either by stirring or heating, so as to show distinctly whether on the addition of more reagent any further precipitate is formed. A very delicate mode of ascertaining this is to dip into the perfectly clear liquid a glass rod, moistened at one end with the precipitant.

(To be continued.)

The Influence of Acids on the Wool Fibre.

We are often told that using acid as a medium for the fulling of woolen cloth, imparts to the latter a hard, stiff handle. This may be the case in some instances, but if met with, says "Das Deutsche Wollen Gewerbe" it is due rather to the heavier and quicker felting which the use of acid permits, than to any independent action between the wool and the acid, and also to the fact, that soap used at fulling, affects the fibres, giving them a smooth and soft handle.

Strong acid liquors certainly impart a harsh feel to the wool fibre, and, what is worse, tender the fibre; but such strong acid liquors are never used for the purpose of fulling, nor for any other purpose in the manufacture of woolen goods, and for a fact, it must be remembered that even if properly diluted sulphuric acid is used for the fulling, water must be added during the process to replace that which evaporates during the process, or the acid will become too strong.

Considered in an average, the strength of the acid as used for fulling, should be the same as is used in dyeing woolen goods in the acid baths, and which are constantly used for dyeing wool and woolen goods without any suggestion that they do any harm. Again, in carbonization, sulphuric acid of about 6 deg. Tw. has no action on the wool, and in the drying if a proper quantity of it has been used it acts on the vegetable matter first, and when that is destroyed, there is then no acid left to injure the wool fibre, in fact, the subsequent neutralization, if it is done with over-concentrated alkaline lyes, will do far more harm to the wool than the actual carbonizing process.

Our German friends further state that experiments have proved that boiling in dilute acid baths imparts to wool a soft and silky handle, and makes the fabrics thus treated more lustrous, especially in the case of piece goods, dyed with acid dyes, which receive a full soft handle, in spite of long boiling during the dyeing process, and are far superior in handle and lustre to the same class of woolen goods not dyed, or dyed in a neutral bath.

Of all dyed piece goods, those which have been sharply decatized previously to dyeing, show these favorable results most prominently, the acid completely correcting any harsh handle imparted to the goods by the decatizing process, which is retained after any amount of rinsing. There is no remedy for correcting natural harshness in wool, independently of dyeing considerations, anything like so effectual as from 30 to 60 minutes' boiling in dilute sulphuric acid. This acid treatment is often given to wools which it has been necessary to treat with alkalies for dyeing and other purposes, the results amply compensating for the expense of the extra bath. With reference as to which kind of acid to use, it may be sulphuric, acetic, or formic. Acetic acid is the one to be preferred, but it is rather expensive.

The souring can be done in the case of goods gigged or not gigged, close finished goods such as meltons and cheviots gaining as much by the acid treatment as napped goods. Indigo blue worsteds made from hard yarn acquire a full soft feel after boiling for forty-five minutes in dilute acetic acid. Such goods should be crabbed before treatment with acid, or, better still, they should be crabbed in acid water, whereby any extra bath is saved. Be sure that all traces of acid used are removed by subsequent rinsing before the goods are finally dried.

PRACTICAL POINTS ON THE SHEAR.

(*Continued from page 127, Vol. III.*)

Grinding and Setting of the Shearing Mechanism. In order to master this subject, the shear-tender, or student, must first make himself familiar with the various bolts and screws, and their uses, in and about the shear head, which comprises the set of fly blades of the revolver, the ledger blade and the back to which it it attached, as well as the frame which holds them all. Without this knowledge, a careful adjustment as required in grinding and setting the blades, cannot be made, since the slightest turn of any one of these various bolts or screws, by a careless or unskilled person, will be the cause of serious trouble.

To acquaint the student with these bolts and screws, and their purpose, illustration Fig. 6 is given, the same showing a complete shear head (Curtis and Marble Machine Co.) in perspective from the back, showing the revolver with its fly blades and its boxes, the ledger blade and the back, to which it is attached, the frame which holds the back for ledger blade and boxes for the revolver, the oil swab and the vibrate attachment for the revolver, all parts ready, to be set onto the machine. The shear head shown, refers to what is known as a narrow woolen or worsted shear, but at the same time explains also a broad shear, since the only difference between both, is that in the latter, two additional intermediate sets of adjusting screws (*d*, *e* and *f* for the ledger blade and its back) between the outside and centre, as indicated by *X*, are used; the broad shear thus having five, in place of the three, sets of these adjusting screws as are shown in our illustration.

In order to assist our descriptive matter, we have lettered the various bolts or screws respectively from *a* to *i*, and of which bolt *a* enters the top of the revolver box, and regulates the raising or lowering of the revolver, *i. e.*, the fly blades, when so required. The two screws *b* are provided for holding down the box caps of the revolver. Screws, as only indicated by letter of reference *c* (not shown since situated at the front of the frame and passing through a slot into the lower side of the revolver box) are placed there for holding the latter in its place. Screws *d*, *e* and *f* serve for the adjustment of the ledger blade, holding the back to which it is attached, securely to the frame of the shear head. Screw *g* holds the latter in place upon the main frame of the machine, and screw *h* serves to raise or lower the whole of the shear head when so required. Screw *i* is provided for allowing the raising of the ledger blade to a new position on the revolver when such is necessary. From the illustration, it will be seen that the bolts and screws thus described, are in duplicate, one set for each side of the shear head, additional adjusting screws *d*, *e* and *f* being shown in the centre of the head, and two more of the latter are provided in the broad woolen or worsted shear, as indicated by *X*, and to which we already have previously referred to.

The three or five, (whether referring to a narrow or broad shear) screws, indicated by letter of reference *e*, are technically called stay bolts, and screw into the frame below, so as to hold the ledger blade and the back to which it is attached, in place. The screws *d* and *f*, as situated respectively above and below the stay bolts, do not screw into the frame, but against it, in order that the stay bolts, while holding ledger blade and its back in place, also serve as a pivotal point from which this part can be tipped by turning screws *d* and *f*. Turning the screws *d* in the head to the right, will press the ledger blade to the revolver, while turning screws *f* will draw it away.

When the blades of the shear are in good running order, the pressure of the ledger blade against the revolver must be uniform all the way across the machine, kept so by the proper adjustment of these three or five series of screws *d*, *e* and *f*. Previously to grinding, see that proper adjustment has been made, *i. e.*, blades be true, being careful to maintain this trueness of the blades during the grinding process, as carried on, on the shear. All adjustment required to be made for the ledger blade during grinding on the shear, as well as during the running of the latter, is generally done by means of the three or five screws *d*, just referred to, since by means of them, the ledger blade is either drawn up to, or let away, from the revolver, although occasionally it may be found necessary to release the stay bolts *e*, in order to permit the proper acting of screws *d*.

Previously to starting grinding the shear, remove the swab and its vibrating attachment, giving also both, the fly blades and the ledger blade, a thorough cleaning, after which remove the caps of the journal boxes of the revolver and take the latter out of the machine. Next clean off the back of the ledger blade, after which place a steel straight edge upon the edge of the latter, in order to ascertain if the same is perfectly true. If found that it is too high in any particular place, remember this, in order that you start the grinding at that particular point, and in this manner try and produce a true edge to the ledger blade, previously to grinding the blade all the way across.

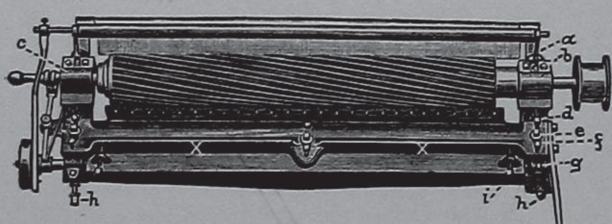


FIG. 6.

After having brought the ledger blade into perfect condition, put the revolver back in its place, having however, previously to doing this, wiped out the journal boxes and put a few drops of oil in them, as well as cleaned the shaft of the revolver. After placing the revolver in its place, put on the caps of the boxes and screw them down properly. In connection with a new shear, the caps may sometimes bind on the revolver shaft, and if such should be the case, insert a piece of paper under the cap, and which will temporarily relieve said binding, the paper being in turn removed later on, after the shear has run for sometime, and when the shaft gets set. Never try and run the shear with loose caps, in order to accommodate any binding of the revolver shaft, using for this reason paper of sufficient thickness to permit tight screwing down of caps.

Next ascertain trueness of revolver, *i. e.*, of the fly blades, for which reason loosen screws *d* sufficiently, so that the fly blades, will refuse to cut dry paper, and in place of it, draw it down between them and the ledger blade, thus freeing the ledger blade from the fly blades and still have them as near as possible to it. Now loosen screws *c* which hold the boxes of the revolver in place, and turn screws *d* to the left, so as to drop the revolver on to the heel of the bevel on the ledger blade, being careful to make a uniform adjustment of both boxes, and that the stay bolts *e* are loosened before either box is lowered, and no change in position of one box is made, while the other is screwed down. Now test again with dry paper, and if the same catches between the fly blades and the heel of the bevel of the ledger blade, set the latter clear at that point.

Having now placed fly blades and ledger blade in proper position for starting grinding, release the rod which operates the list saving motion, and remove all belts from machine. Cover up all parts of the latter, except the cloth rest and blades, to keep them clean from being spattered with oil and emery, as required for the grinding process. Set the blades away from the rest about $\frac{3}{32}$." Put on grinding belt (cross belt) to run the revolver backward, and when the shear is ready for the grinding process.

(To be continued.)

DICTIONARY OF TECHNICAL TERMS RELATING TO THE TEXTILE INDUSTRY.

(Continued from page 92.)

G.

GAGING THREAD:—A thread introduced in weaving, temporarily near the edge of the web, for the purpose of stopping the filling outside of the web at a desired point; the filling forming loops at the edge. This thread is drawn out after the web comes from the loom.

A thread used in pearl edge weaving.

GAITER:—A cloth or leather covering for the leg or ankle, fastened at the side, and usually held in place by a strap running under the arch of the foot.

GAIT-OVER:—The English expression for the number of harnesses required for repeat of pattern; for example: the pattern has 12 ends to its gait-over and 20 picks to the round.

GALLOCYANIN:—A coal-tar color ($C_{15}H_{12}N_2O_5$) dyeing cotton, wool or silk a blush violet color of fair brilliancy, but absolutely fast. It is obtained by the action of nitroso-dimethyl-aniline on tannic acid.

GALLEIN:—A coal-tar color ($C_{20}H_{10}O_7$) prepared by heating phthalic with pyrogallic acid. The dye imparts to fabrics, previously mordanted with iron or alumina, a somewhat bluer shade than that obtained from logwood.

GALLINI COTTON:—A species of cotton grown in Egypt, of the Sea Island type and produced from seeds of the G. Barbadense.

GALL NUTS:—Also known as Nutgalls or Oak Apples. This most valuable dyeing material is an excrescence from a certain tree; caused by a little insect puncturing the leaves or small branches of the tree, for the purpose of depositing its eggs in the cavity thus formed. The juice of the tree then collects round the egg, hardens and forms the gall nut. If the larvæ have eaten out, a loss of astringent principle occurs in the nuts, the same being then termed green galls.

GALLOON:—A narrow silk, worsted or cotton tape interwoven with threads of gold, silver or both, used on uniforms, etc.

An embroidered dress trimming made of cotton or silk, with or without a scalloped edge.

A narrow lace like worsted ribbon or tape, used for binding purposes.

GAMBADE OR GAMBADO:—A legging to protect wearer from the spatter of mud.

GAMBIER:—It resembles closely catechu or cutch and is obtained by extracting the leaves of a shrub growing abundantly in the Malage and India Islands, known as Uncaria Gambier. It contains varying amounts of a tannin known as catechu-tannic acid or mimotannic, and a white crystalline body called catechine or catechine acid.

GARANCEUX:—A preparation obtained from the spent or exhausted madder, consequently weaker than garancine.

GARANCINE:—Formerly an important red-dyeing preparation of madder, obtained by treating madder-root with sulphuric acid.

GARIBALDI:—A loose blouse waist; the name being derived from Garibaldi, the Italian patriot, whose soldiers wore them.

GARMENT:—The larger articles of clothing or customary dress, as coats, gowns, etc.

GARNETTED WASTE:—Woolen waste which has been passed through a garnetting machine and thus re-worked in a condition in which it can be used again in the manufacture of woolen yarns.

GARNETT MACHINE:—A machine used for the purpose of combing out all hard waste, whether from mules, spinning frames, or from whatever source twisted or tangled fibers are produced in the various processes of the manufacture of yarn; as well as of the pieces, clippings, or remains of the manufactured product (after being picked on the shoddy picker) and to restore it to loose fibers. These machines, in principle, are carding engines constructed in a more compact form.

GARTER-WEBBING:—A narrow elastic webbing, the rubber warp threads being covered either by cotton or silk warp and filling.

GASSING:—The process which the spun thread, or the woven fabric, Silk, Worsted or Cotton, undergoes to render it smooth and even, by getting rid of the nap or raised fibers. Thread or Fabric pass in the process several times closely over series of small gas flames or over a heated plate, moving so rapidly that all the fluff is burned off, but the thread or the fabric remains uninjured. The same result is also obtained by substituting electricity in connection with gassing thread.

GATI:—A cotton diaper cloth of East India.

GATTINE:—A disease of the silkworm.

GAUFFRÉ:—A silk fabric which has had forms in relief pressed into it by an operation known as *gauffrage*, these figures being retained by the fabric for sometime, if the process is carefully done. The operation is applied chiefly to lightweight fabrics, such as pongees, muslins, etc. Satins can be made in imitation of moiré in this way. Fluted and accordion-pleated effects are also produced by it.

GAUGE:—A term used in connection with the number of meshes or wales to the inch, in underwear or hosiery; for example, a 12-gauge fabric will have 12 wales or ribs to the inch, etc.

The distance from centre to centre of spindles or rollers.

GAUZE:—Woven fabrics of transparent texture, first introduced from Gaza, a city of Palestine.

A light perforated fabric in which the warp threads are made to twist more or less around each other by means of doup weaving, being held in place by the filling.

GAW:—A crease in cloth.

GAZZI:—A material for furniture with large stripes of dazzling colors, made of silk warp and cotton filling, also of all cotton; made at Diarbekir, in Asia Minor.

GEARS:—The Scotch term for the English term *healds* or the American term *harness*.

GELATINE:—See glue.

GENAPPE:—A smooth worsted yarn, used with or without silk in the manufacture of fringes, braids, etc.; first made in Genappe, in Belgium.

GENOESE CORDUROY:—A pile fabric, so termed after Genoa the prominent city of Italy and where the same was first made. The arrangement used in connection with the weave for this fabric is, one ground pick to alternate with four pile picks. The weave employed for interlacing the ground structure is the 3-harness twill, warp effect. Two sizes of pile floats are formed, one over six warp threads, the other over eight warp threads, this combination when cut imparting to the cord a nice round effect.

GENOESE EMBROIDERY:—Fine Art Needlework, done on sheer linen or cotton, outlined with a kind of thin cord and button-hole stitch.

GENOESE VELVET:—A richly patterned silk velvet, of which the pattern is produced in pile and the background flat and smooth; sometimes interwoven with gold threads.

GERMAN WOOL:—Same as Berlin Wool.

GERMANTOWN YARN:—A coarse woolen yarn of rather heavy count, extensively used for knitting fancy articles like hoods, scarfs, mittens, etc.; so called from Germantown, Pa., where first made.

GIG:—A machine for raising a nap on cloth by means of teasels set in slats, which then are arranged on one or two large revolving cylinders, over which the cloth is caused to pass.

GIGGING:—The process of producing a nap on cloths by combing or teaseling out the several fibres which in fulling have become felted together on the face and back of the goods.

GIG-FLOCKS:—The waste taken from the cloth by teasels in the process of gigging.

GILET:—A waistcoat, as the vest-like front of the bodice in a gown.

GILL BOX OR GILLING MACHINE:—Machines used in the manufacture of worsted yarn, for leveling and laying parallel all the fibres with each other, previous to the process of combing, in order that the latter operation may be conducted with greater facility and less damage to the staple. They consist of a pair of rollers which catch the wool fibre and of a second pair of rollers which draw it forward over heavy steel bars, known as fallers, which are covered with projecting pins. These machines are used in sets, each successive machine having the pins of the fallers finer and more closely set than the preceding.

GILL PINS:—The pins of the faller, a device of the gill box.

GIMP:—A narrow, flat, ornamental trimming, made of silk, worsted or cotton cord, usually formed of or interlaced with cord or wire, and more or less open in design, used for borders for curtains, furniture and dress trimmings.

GIMPING MACHINE:—The loom on which gimps and similar trimmings are woven.

GIN:—A machine whose object is to separate the cotton fibres (lint) from the husk, berry or seeds to which the filaments most tenaciously adhere. Cotton gins are of two types, the roller and the saw gin, the former being used only for the longest stapled (Sea Island) cottons, the latter (the saw gin) in connection with the other cottons, and hence in universal use.

GIN-CUT COTTON:—Cotton staple cut during ginning on the saw gin, distinguished by matted tufts of densely white fibres present in a lot of cotton.

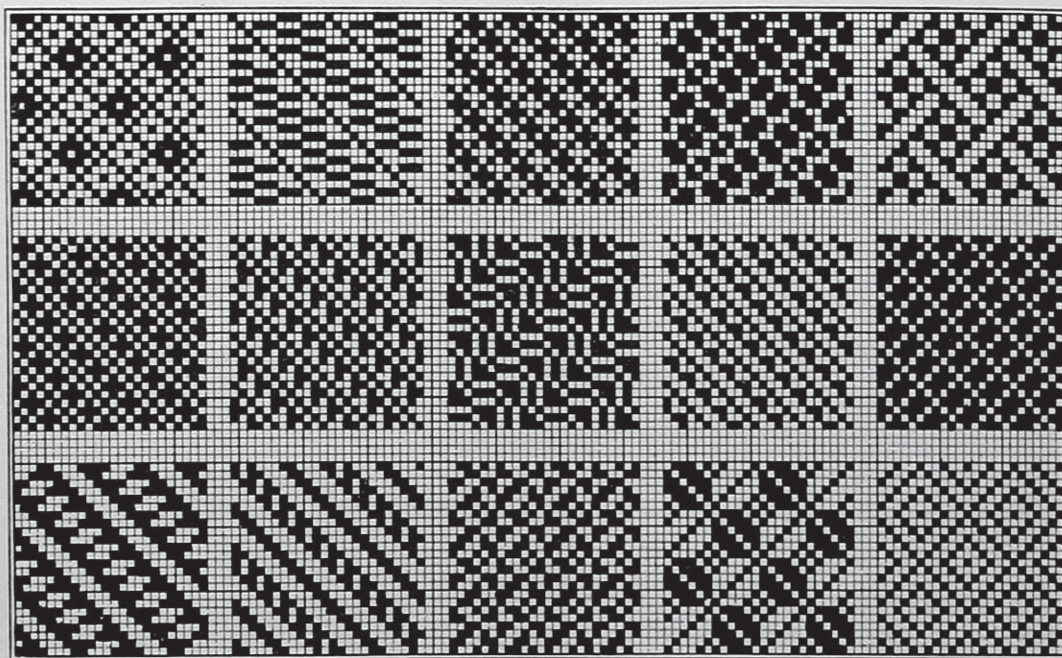
(To be continued.)

FROM A MILLWORKER OF FKD., PHILA.

E. A. Posselt:—I have just returned home after an unproductive trip to the Eastern Textile Centers. I enclose $1.00 from my first week's pay and will send like sum each two weeks, until I put myself in good standing. Let me close by saying that I regard your Journal as a very valuable publication. J. E. M. 3-12-09.

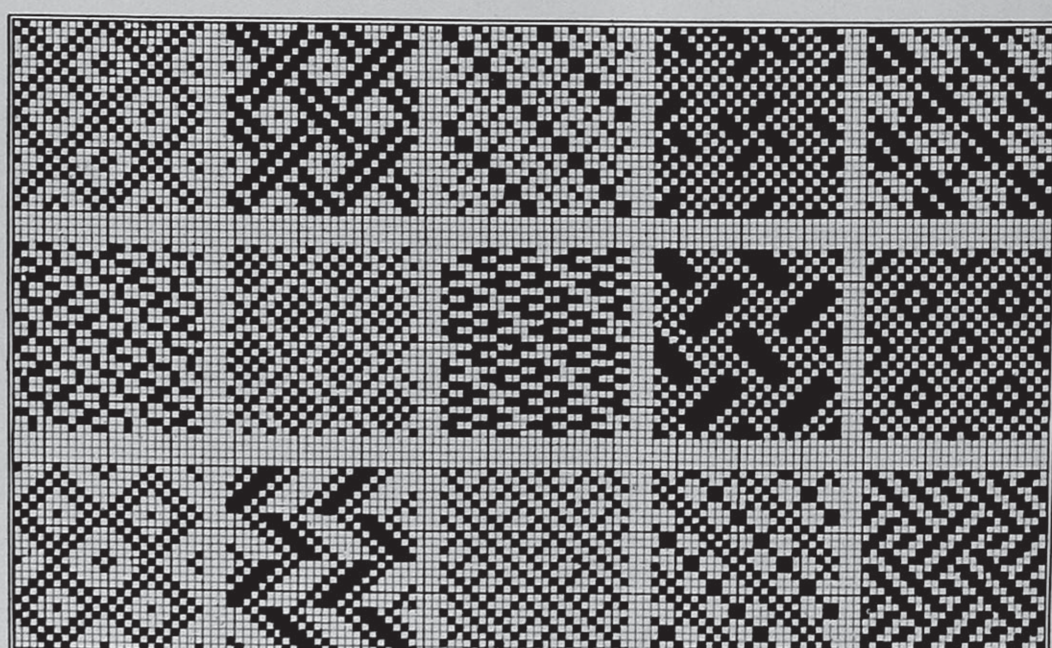
DICTIONARY OF WEAVES.*

TWELVE HARNESS



12 X 12

TWELVE HARNESS



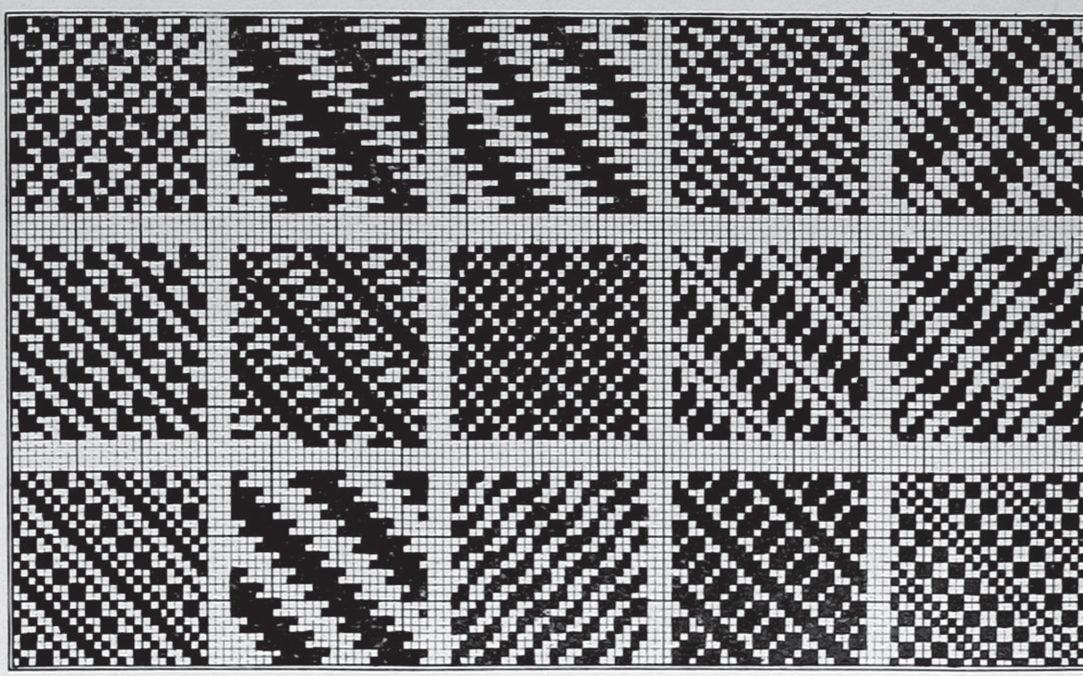
12 X 12

* Complete, this Dictionary will contain about TWENTY THOUSAND PRACTICAL WEAVES, taken from woven Fabrics. About One Thousand Five Hundred of them have thus far appeared, and can be obtained by ordering back numbers.

DICTIONARY OF WEAVES.*

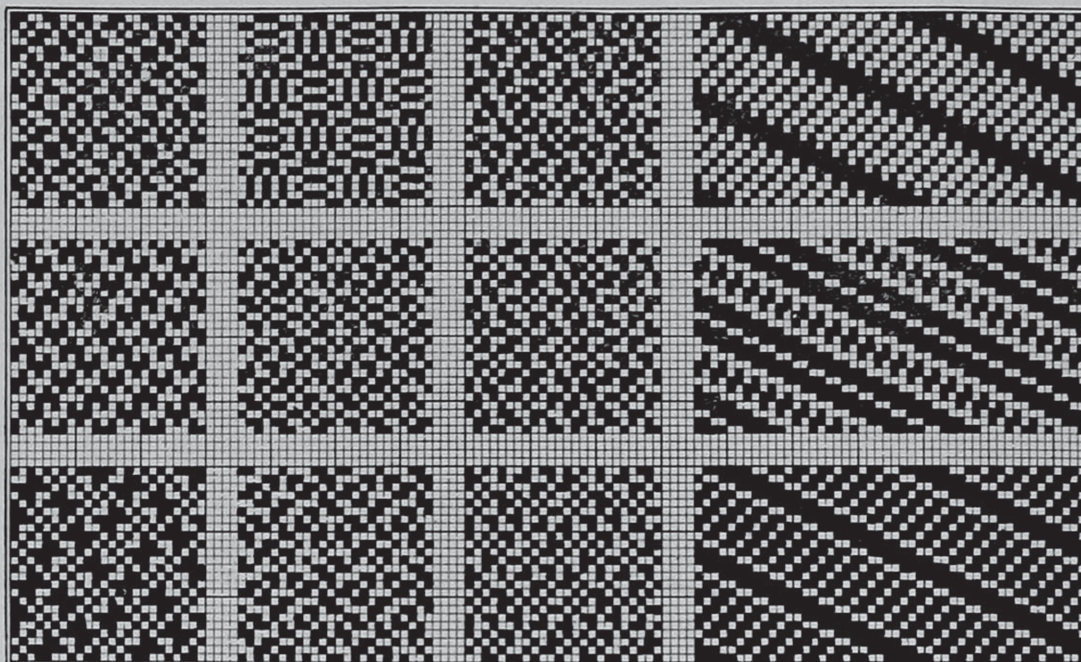
TWELVE HARNESS

12 × 12



TWELVE HARNESS

12 × 12 and 12 × 24



* The Only Reliable Collection of PRACTICAL WEAVES in Print.

INSOLUBLE SOAPS IN FINISHING.

By Jules Garcon, in *L'Industrie Textile.*

Finishing textiles is one of the most intricate trades, depending for its success as much on chemical as well as mechanical means employed. A knowledge of practical chemistry will be found of advantage, but actual practical experience is the more valuable. One of the most frequently met with difficulties a finisher has to face, is the trial of new products or of new processes. Finishing compounds are thickened liquids, the thickening being usually prepared with starches, flours, gelatine, casein, gums, fatty bodies, glycerine, and others, each particular mixture devised to impart to the cloth certain qualities according to their composition. Textile literature will not prove of great help to the finisher. Although there are any number of works on the subject published the information imparted by them differs.

There is one class of substances which has only recently come into use for finishing purposes. This class is made up of the insoluble soaps which contain the same fatty acids as ordinary soaps, combined however with the oxides of heavy metals instead of with those of sodium and potassium; *i. e.,* soaps which have been used for sometime in the production of comparatively waterproof fabrics.

Finishers have always avoided the use of insoluble soaps, in fact the finisher considers himself unfortunate if they are formed by some unintentional cause during the finishing process, and as a rule he has taken every precaution to avoid their appearance and the faults to which they give birth. M. Agostini appears to have been the first to propose the use of these compounds by a process free from drawbacks.

At first sight it would seem difficult to incorporate insoluble soaps in a finishing paste so as to obtain a homogeneous mass. Nevertheless, the proposal by Agostini is one that merits attention.

According to the patented claims the preparation to be employed in finishing is made by mixing at high temperatures the insoluble soaps with fats or petroleum. In this way a perfect emulsion can be obtained, which will bear the addition of dyes, weighting substances or the ordinary starch or albuminous bodies. A special method of application consists in producing these insoluble soaps directly on the fibre, by applying the mixture of a neutral animal or vegetable oil or petroleum, of a fatty acid and a metallic oxide, or co-relatively of a salt of this oxide, and then by drying (heat) to induce the formation of the insoluble soap in a state of close adhesion to the fibre.

These are the essential features of the process invented by Agostini who claims the following particular characteristics for the materials so treated:

(1) They gain somewhat in the matter of strength, because of the progressive formation and the intimate union with the fibre of an elastic and adhesive compound. The cloth acquires a more compact and a fuller appearance because of a slight swelling of the fibre that results from this absorption.

(2) They are not waterproofed.

(3) They gain in weight proportionally to the quantity of the compound precipitated on them.

(4) The cloths thus treated do not lose the dressing, either in washing or in calendering, and the finish is for this reason fixed.

It is stated that a very interesting method of application consists in mixing these insoluble soaps with ordinary size or starch paste, and that such compounds possess sufficient pliability that a fabric may be charged with 50% of its weight of albuminous or starchy matters without imparting undue harshness to it.

Bleaching Half-Silk with Peroxide of Sodium.

Mixtures of cotton and silk, or of wool and silk, can be bleached by the following process:

After soaping at the boil, and then rinsing out all the soap, work the goods for half an hour at 86° F., in a bath containing for 100 lbs. of half-silk 30 lbs. of sulphate of magnesia. Lift and rinse. In the meantime, add to the magnesia bath 10 lbs. of sodium peroxide in two or three lots. Re-enter the half-silk, and heat up to 167° F. Then raise to the boil, lift immediately, neutralize with dilute sulphuric acid, rinse thoroughly in clean water, and dry. Care must be taken that the sulphate of magnesia is free from chlorine. This is a point of great importance. (Dyer and Calico Printer.)

Dornimine is a preparation of starch with caustic soda lye, much used by finishers in Austria. Cassella's apparatine is a similar product.

BOOKS ON TEXTILE SUBJECTS.

Wool Dyeing (Part 1), by W. M. Gardner. Price $2.00.
TABLE OF CONTENTS: Fibre, Scouring, Bleaching, Water, Mordants, Assistants and other Chemicals.

Wool Dyeing (Part 2), by Gardner and Knaggs. $3.00.
TABLE OF CONTENTS: Classification of Coloring Matters; Natural Dyestuffs: Logwood, Redwoods, Madder, Cochineal, Kermes and Lac-dye, Orchil; Cudbear and Allied Coloring Matters, Yellow-Dyes, Indigo; Artificial Dyestuffs: Classification of Coal-tar Dyes, Artificial Mordant Dyes, Acid Mordant Dyes, Acid Dyes, Direct Cotton Dyes Suitable for Wool, Basic Dyes, Dyes Applied by Oxidation, Reduction and other Special Processes, Metallic Dyes, Methods of Dyeing Wool in Various Forms, Suitability of Dyes for Different Classes of Work, The Theory of Wool Dyeing.

The Dyeing of Cotton Fabrics, by F. Beech. Price $3.00.
TABLE OF CONTENTS: Fibre: Action of Alkalies, Acids and Oxidising Agents; Bleaching; Dyeing Machinery and Manipulations; Principles and Practice of Cotton Dyeing; Dyeing Unions, Cotton-Wool, Cotton-Silk; Washing, Soaping, Drying; Testing Color; Experimental Dyeing and Comparative Dye Testing.

Silk Dyeing Printing and Finishing, by G. H. Hurst. Price $2.00.
TABLE OF CONTENTS: Fibres; Boiling Off; Bleaching; Dyeing Blacks and Fancy Colors; Weighting; Dyeing Mixed Fabrics; Printing; Dyeing and Finishing Machinery and Processes.

Dyeing of Textile Fabrics, by Hummel and Hasluck. Price $2.00.
Three Volumes Bound in One.
Vol. 1: Textile Fabrics and Their Preparation for Dyeing.
Vol. 2: Coloring Matters for Dyeing Textile Fabrics.
Vol. 3: Mordants, Methods and Machines used in Dyeing.

Wool, Cotton, Silk; Fibre to Finished Fabric, by Posselt. Price $3.50.
TABLE OF CONTENTS: Raw Materials; Preparatory Processes; Carding, Drawing, Spinning and Twisting; Winding, Warping; Weaving Machinery and Supplies; Knitting, Processes and Machinery; Dyeing, Bleaching, Mercerizing, Processes and Machinery; Finishing, Processes and Machinery; Heat, Power and Transmission.

Color in Woven Design, by R. Beaumont. Price $7.50.
This work contains on 32 plates 126 colored illustrations of Diagrams Illustrating the Mixing of Colors; Fancy Yarns, Fancy Cassimeres, Worsteds, Trouserings, Coatings, Suitings, Ladies Dress Goods, Cloakings, Fancy Cotton and Silk Fabrics. Besides said 126 colored illustrations, the work contains 203 illustrations, in black and white, of Weaves and Color-Effects in Fabrics, etc., accompanied by 440 pages of reading matter.

Chemistry of Dye-Stuffs, by G. von Georgievics. Price $4.50.
A textbook presenting to the student in as condensed a form as possible the extremely wide domain of the modern chemistry of dye-stuffs; bringing into prominence all the relations known to subsist between the various dyes and groups of dyes, as well as the connection between color and constitution, since the proper appreciation of these relations forms the main object of color chemistry.

The Jacquard Machine, by E. A. Posselt. Price $3.00.
TABLE OF CONTENTS: Different parts of the Jacquard Machine and its Method of Operation; The Jacquard Harness; The Comberboard; Tying up of Jacquard Harnesses for all kinds of Fabrics, Modifications of the Single Lift Machine; Stamping, Lacing and Repeating of Jacquard Cards; Practical Hints on Jacquard Designing.

Testing of Yarns and Textile Fabrics, by J. Herzfeld. Price $3.50.
A Guide for the Manufacturer and Large Purchaser, who observe definite specifications to insure standard material and workmanship; also giving a collection of tests, both of physical and of chemical nature.

Woolen Spinning, by C. Vickerman. Price $1.75.
TABLE OF CONTENTS: Fibre, Supply, Sorting, Scouring and Drying, Bleaching and Extracting, Dyeing, Burring, Mixing and Oiling, Carding, Spinning, The Mule, Miscellaneous.

Wool Combing, by H. Priestman. Price $1.50.
TABLE OF CONTENTS: Fibre, Washing, Water, Carding, Preparing, Intermediate Processes, Combing, Finishing, Tops and Top Testing.

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TEXTILE PUBLISHING COMPANY
Lambert and Berks Sts. **PHILADELPHIA, PA.**

MILL NEWS

Philadelphia. Five Carding-engines, manufactured by Platt Bros. Co., Ltd., of Oldham, England, have been installed by the Ontario Spinning Company, Second street and Columbia avenue.

The Caledonia Carpet Mills, 2310 Hamilton street, formerly owned by Alexander Crowe, Jr., and recently placed in the hands of a receiver, has been opened by the George W. Lefferts Co., and as soon as repairs to the machinery are completed a large number of men will be given employment, about sixty being already employed.

Mr. Thomas Henry, Jr., a well-known yarn manufacturer of this city, has purchased the factory plant at the northeast corner of Seventh and Huntingdon streets from William W. Keefer, for about $65,000. The plant will be occupied by the purchaser about June.

The Tracy Worsted Mills Co., Twenty-fifth and Spruce streets, after having been idle for about two years, has been leased by the American Woolen Co. for one year. The output will be worsted yarns, spun by the Bradford system, for men's wear.

Allentown, Pa. The Ansonia Silk Company, a new concern of which Mr. Charles Saperstem is the manager, has started a new mill at Hall and Maple streets. While it is the intention of the concern to install broad silk looms, winding machinery has been installed. Within four weeks 30 hands will be employed.

Kaltenbach & Stephens, of East Allentown, manufacturers of narrow ribbons (170 looms), have purchased a tract of woodland near their mill. Work will begin on the new structure as soon as the tract is cleared of timber.

Aston Mills, Pa. Benjamin Crowther, superintendent of the May Worsted Mills, has resigned; also Robert Hutton, the designer, the latter accepting a position in a New England mill.

Catasauqua, Pa. Mr. Dery is to build an 11-foot addition to his plant on Front street.

Chester, Pa. A 150-horsepower engine, pump and three carloads of looms have arrived at the Chessauqua Silk Manufacturing Company's plant.

Messrs. Welsh & Dick, of Clifton Heights, have leased the mill known as "The New Mill," at Rockdale, which was erected in 1872 by Samuel Riddle & Son. This mill contains 114 Bridesburg roller looms, which will be run on Turkish towels, and later on increased to 200 towel looms. Welsh & Dick are very successful manufacturers in their line of work, being compelled to run their Clifton plant day and night.

Clifton Heights, Pa. Contract has been awarded by Nelson Kershaw, the prominent manufacturer of Turkish towels, of this place, for the erection of an addition to his mills, two stories high, to be used as a bleachery, dye house and finishing department.

Ephraim, Pa., will soon have a knitting mill. Funds have been secured to justify the company in arranging for the installation of the machinery. Carl Hausen, of Spring City, Pa., is the head of the company.

Lebanon, Pa. Jansen & Pretzfeld, of Newark, N. J., running a silk mill in that city and one at Pleasant Hill, it is reported to have succeeded in securing the necessary support to erect another mill, 50 by 200 feet, three stories high, at Locust street at First avenue, south of The Heights.

Reading, Pa. L. M. Miller and James M. Stoudt, of the Mount Penn Underwear Mill, will erect a new plant on North Twelfth street.

York, Pa. The York Silk Manufacturing Co. has restored the reduction made in the wage scale at its mills last year when the financial depression was at its height.

Wilkes-Barre, Pa. The Leon-Ferenbach Silk Company, a new concern, has purchased a site for their factory on Hazle avenue, between Jones and Blackman streets. A silk mill, 200 by 50 feet, two stories in height, engine room and office will be erected.

John Ferguson, the well-known specialist in the construction of reenforced concrete Textile and Manufacturing Plants, has received the contract for the erection of the mill.

Paterson, N. J. The Brookdale Bleachery, of Hohokus, has been placed in the hands of a receiver, after running at a loss for a long time.

George W. Smith, proprietor of the Alburtis Silk Ribbon Mills, of Alburtis, Pa., and his sons, Cyril G. Smith and Charles E. Smith, have put up a large mill at Paterson, which they will run with the Alburtis plant. Charles will be superintendent of the Paterson plant and Cyril of the Alburtis mill.

Phillipsburg, N. J., now has six silk plants, and two new ones are contemplating erection.

Charles B. Brady is the head of a newly incorporated silk company, which has leased the building formerly used as the machine shops of the Lackawanna Railroad, and will employ several hundred weavers.

Maucklin & Firth's silk mill has outgrown its quarters, and the firm now has plans in the hands of contractors for a large two-story brick and stone mill.

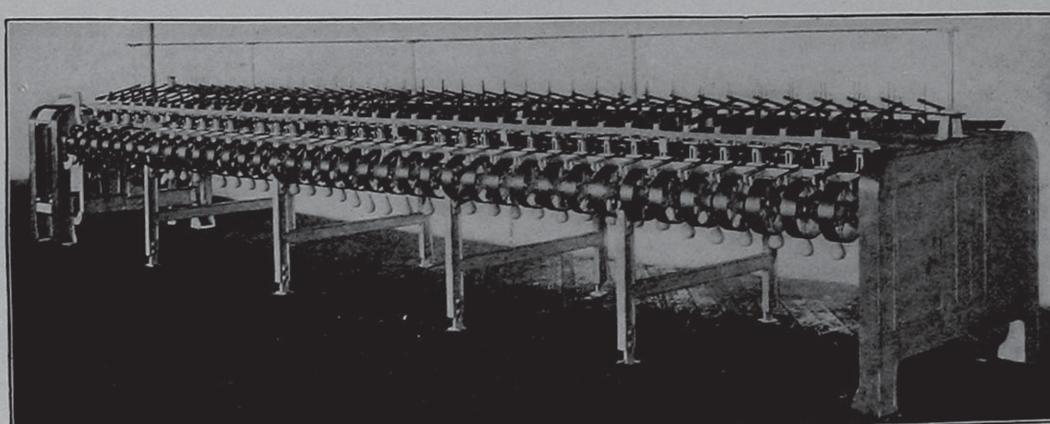
The Continental Silk Co. is installing machinery in the new annex, which, when completed, will give employment to 800 operatives.

Fulton, N. Y. The American Woolen Co. is erecting a yarn mill at a cost of $1,000,000.

Mohawk, N. Y. The Paragon Knitting Mill, which has been idle for some time, has been sold to the Augusta Knitting Mills Co., of Utica.

Seneca Falls, N. Y. Mr. Robert Weichert, who came here to start the Seneca Woolen Mills, reports success

(*Continued on page xvi*)



in the matter of raising funds for that purpose. The mills are to be operated on the coöperative plan.

Agawam, Mass. The Agawam Company has started on the erection of a 60 or 70 feet, two-story high addition to its present mill. This will give place for ten new looms and new machinery for their finishing department, for which they have also ordered S. & S. Decatizing Machinery.

Clinton, Mass. The Brodfelt Worsted Company has been incorporated, taking over the mill of the Litchfield Worsted Mill. The company will manufacture worsteds for men's wear. Its president is Wenzel J. Brodmerkle, Clinton; treasurer, Walter F. Felton, Dedham, and clerk, Charles Frazer, Clinton.

Fall River, Mass. The new No. 3 Sagamore Mill is being equipped with every labor-saving device known to the manufacturers of textile machinery. One of the improvements will be the transmission of power in the weaving department, the belt drive being connected with the driving wheels beneath the floor.

The Troy Cotton & Woolen Manufacturing Company has issued to its stockholders a $300,000 bond issue as a dividend, the same being equivalent to 100 per cent. on the capital. The bonds are 30-year 5 per cent. first mortgage coupon bonds, issued under date of March 1, 1909. A condition of the mortgage provides for their retirement at 105 at any time after three years.

Greylock, Mass. A $100,000 contract has been awarded by the Greylock Manufacturing Company, for the erection of a large addition to the mill which will double the capacity of the plant.

Holyoke, Mass. The Farr Alpaca Company has awarded the contract for a new mill to be built on the north end of their present Jackson street mill. The addition will be a four-story building, 200 feet long and 54 feet wide, to be used by the finishing department of the concern.

Lowell, Mass. The manufacture of worsted yarns is to be started here by Mark Ingham, formerly superintendent for the Moore Spinning Company, of North Chelmsford. The location of the new plant is the building formerly occupied by the American Bolt Company.

The Musketaquid Mills has started on the erection of its new mill at the corner of Davidson and Howe streets, which hereafter will be a part of the United States Worsted Co. The new mill will be five stories high, 60 by 63 feet. One story will be added to the old mill building. The dimensions of the completed mill with the old will be 60 by 130 feet. At the present time there are 75 looms in operation day and night, in an effort to keep up with the orders. When the addition is completed there will be 150 looms.

Medway, Mass. The Sanford Mills, formerly operated by the Medway Woolen Company, and which have been idle for two years, have been sold to the Pittsburg Woolen Company.

New Bedford, Mass. Work has been started on the new spinning mill and weave shed for the Dartmouth Manufacturing Company. The new spinning mill will be 409 by 110 feet, four stories high, and the weave shed 353 by 100 feet, two and a half stories.

North Adams, Mass. The construction of the new weave shed of the Blackinton Mills will be rushed so as to be able to produce goods by July.

North Andover, Mass. The Brightwood Manufacturing Company, manufacturers of worsted dress goods, has had plans and specifications prepared for a new mill, 250 feet long, 80 feet wide, two stories in height, to be erected on the Lawrence side of the Shawshin River, just over the boundary line.

North Brookfield, Mass. The Oxford Linen Mills, after only eight months of operation, has established trade connections throughout the country so favorable as to pay a dividend for the quarter ending March 31.

Pittsfield, Mass. The Pontoosuc Woolen Manufacturing Company has placed an order for 25 worsted looms which it expects will be in place and ready to operate in about two months.

Plymouth, Mass. George Mabbett & Sons have started work on a 30 by 115 feet addition to their mills.

Salem, Mass. A 200 by 250 feet weave room is to be added to the plant of the Naumkeag Steam Cotton Company.

Saugus, Mass. The Saugus Manufacturing Company, established in Saugus about ninety years ago, and formerly known as Pranker's Mills, has been taken in the recently organized U. S. Worsted Company. At present about 150 operatives are employed at the mills, but the number will be brought up to about 230. In the future all of the dyeing and finishing will be done at the works of the Lawrence Dye Company, the chief owner of the concern.

Mr. Samuel Bailey, Jr., the present manager of the plant, will remain in charge of the works under the new management.

EXPLANATIONS FOR THE CHART OF WEAVES ON

"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, Hucks, 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 $\frac{1}{3}$ 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.—Twills *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 *t' w'*, has for its foundation the 63° twills, marked also respectively *t'* and *w'*, the latter two weaves have again for their foundation respectively the common twills marked *t* 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 $\frac{2}{2}$ 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.

Posselt's Textile Journal, Philadelphia, Pa.

"TEXTILE DESIGNING SIMPLIFIED."

Keep this chart on hand for reference. Only 144 weaves are given, yet they will guide you to make millions of new weaves.