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A Monthly Journal of the Textile Industries

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Review of the Knit Goods Trade.

Throughout the knit goods industry the trade is very quiet. In some respects it is an in between season period, and agents seem to have little thought of preparing new spring lines until they are better satisfied with the course of the other markets.

As is the condition in other lines, buyers are laying back, and are doing all they possibly can to break through the attitude of the mills that have already foregone profits, in order to keep organizations at work.

Buyers, particularly among the staple heavy cotton ribbed goods and some of the better qualities of ladies' heavy weights, seem fully confident that they can come into the market in June or a little earlier and pick up the goods they require at prices of their own making. From all indications, and the present news of selling agents, the expectations are that they are likely to be disappointed, and are sadly mistaken in their conclusion.

If they can accomplish this, it will be on account of mills accumulating surplus stock which they cannot unload any other way.

On fall goods, deliveries are being made in some instances. On fine super weights, in cotton and woolen goods, the best mills are sold well ahead and could secure more business if they were prepared to make deliveries. While this is exceptional, it should not be taken as a measure of market conditions; it is also true that some other lines of goods are well under order for fall. Some of the mills that are busy, however, admit they will make no profit beyond keeping their working forces engaged and holding their regular trade.

The demand for union suits is encouraging. Those mills that have made lines of ladies' union suits in novelty patterns are doing very well, although some of them feel that the current vogue for some styles will pass off in a short time; still there are rarely any too many of these goods to be had even in dull times.

An analysis of the trade in general shows that the manufacturers of fleeced underwear are doing very little, and salesmen say the demand for these goods is very small and that they are rapidly losing favor among the consumers.

The cheaper grades of underwear that retails at 25 cents is quiet. In 1907 these goods were sold to jobbers at $1.90 a dozen. The best prices the jobbers can now get them at is $2.10, and, even at this price there is no money in them for the manufacturers at the present prices of yarn, as the goods weigh seven pounds to the dozen. The manufacturer, to show any profit, should get at least $2.25 a dozen.

In discussion this question, a salesman for an underwear manufacturer said, that $2.25 was a prohibitive price as the advance from $1.90 to $2.10 was sufficient to kill the demand. It is his opinion that if they could be put in the jobbers' hands at a cost of $2, at least 50,000 cases could be sold and probably more, but at $2.10 the jobbers will not touch them, as they prefer to push the better grades, the difference in price being very little, and on which they make a larger profit.

Manufacturers of plain and ribbed underwear that sells at 50 cents and upwards per garment are doing a little business, while light weight summer underwear is scarce, and jobbers are demanding spot goods.

A Review of the Hosiery Trade.

The hosiery trade, taken as a whole, appears to be in a very unsettled condition. Buyers seem to be holding off as long as they can in ordering staple qualities for fall. The decision among a majority of buyers is that they will not purchase until prices break, which they say must come before they place any large orders. Some little buying is being done, but only for the goods they actually need; always on the lookout for a bargain, which sometimes are good finds, but, more often they get just what they pay for in weights and general manufacture.

The mills are answering this attitude by waiting and watching, although it is said that bids are being asked from buyers of staple hosiery stocks, that have accumulated, as well as for the goods that will be made, even if the mills continue running on short time. The cheapest prices heard of are based on 70 cents for one pound eight, seamless, 176 needle, but this price is lower than the best goods can be purchased at, for any sizable quantity.

A feature of the market has been the tendency of some mills to offer goods at as low as 10 per cent below the opening figures, which represents the decline in piece goods, but has no thought of the intrinsic worth of hosiery. The business of course, is to be had at such prices, but the standard mills are allowing such business to pass them by, for it is a sure thing that business on this basis will lessen the power of further manufacture until a receiver has looked into things.

While the condition in the majority of the trade is off, yet a number of manufacturers of better grades

are doing a fair business, and in some instances are behind in their deliveries.

One thing that is apparent, is that foreign manufacturers using Egyptian yarns are asking very high prices for their lines, and there is a tendency on the part of some buyers to place new business with domestic mills that have never carried any bulk of this class of business heretofore.

A Review of the Men's Wear Trade.

During the past month very little change has been noticed among the worsted trade. Some mills have been fortunate enough to secure inquiries for hard faced materials, but it appears that this is due to the fact that the initial supply of worsted was limited compared with the woolens. While this condition has been the means of encouraging the factors, yet, the majority do not feel very much enthused over the trend of business. As a whole, the demand has been very irregular and it appears that buyers are willing to talk on any other subjects than that of worsteds.

A number of mills seem to have come to the conclusion that the fall season will, in a certain measure, determine the destiny of worsted for a time to come. They base the conclusion on the fact that woolens may not carry the fall season and should such be the case, worsted will be secure for the coming light weight season; but, taking it all in all, it appears that there must be a radical change in the prices of raw materials before the worsted trade can be expected to improve to any great extent.

The past month also witnessed the introduction of a number of supplementary lines, with prices as the foundation, and factors who were selling below the market were fortunate in securing re-orders, while the greater majority content themselves with the fact that it is rather early to expect duplicates in such lines.

It is said that there is a movement on foot among a number of houses who failed to get the business this season, to get their share and more too of the light weight spring 1911 season, even if they have to offer prices which are out of reason, based on present ideas of values.

Taking the season as a whole, it is considered closed by almost all those interested in the line, and a majority agree that the season has been a failure as far as worsteds are concerned, and are devoting their efforts to making good in the next.

This is readily verified when in describing the situation, a selling agent called attention to the fact that on three lines of worsted, he has so far received one duplicate.

The woolen situation presents an entirely different attitude. Certain lines are sold up and the mills are out of the market and a large number of others are in the same condition, and taken as a whole the woolen industry is very optimistic and it is said that practically all the woolen producing machinery will be employed in the coming season.

One feature that presented itself during the month, was the volume of repeat orders received by the various houses, and some of the mills were sold ahead to such an extent that they had to take the orders subject to productions in other mills than their own.

The majority of duplicates, in fact about 85 per cent, exclusive of the fine goods, appear to be upon woolens ranging between 65 cents and $1.10 a yard. It is due to this fact that it is difficult to get goods made by mills other than those who originally brought them out, as the prices operate against their successful reproduction.

One thing that seems apparent, is that the prices of woolen suitings may be advanced as the season for re-ordering progresses, in fact sales managers having the fabrics in demand, are already working out such a move. It is probable that this advance may amount to possibly 2½ to 5 cents a yard, not because of the price of raw materials, but the mills think such action is warranted owing to the low prices at which these goods were originally opened.

It is thought that this movement in the price of woolens may advance in some instances to a point beyond which buyers will refuse to go, but as far as the coming heavy weight season is concerned, the future is assured.

There seems to be no anxiety in the woolen trade that the success of the coming season will be affected in any way.

Broadcloths, according to experts in that line, are passing through the quietest period in years. Houses that formerly have booked orders for thousands of pieces, are now accepting single piece orders as the best the market has to offer.

One feature of the market is the demand for wool plaids, which according to some mills, is the greatest in the past three years.

Cheviots are in great demand, and from all indications will continue so for the fall season.

The demand for serges is very quiet, but it is remarked that as is the usual case, as soon as warm weather sets in, buyers are falling over one another to get them.

The kerseys show a betterment, considerable inquiry having been manifested along this line.

Looking Ahead to Spring 1911.

From present indications, it appears that the success of the season in men's wear, whether it be worsted or woolens, depends entirely upon the values offered and the wearing quality of the goods which are being sold this season.

That woolens are within the lurch of fashion becomes more apparent every day; manufacturers are realizing that the demand for woolens is more than a transitory feature and that the trade is demanding, and will continue to demand, the soft faced fabrics, also that the consumer desires the soft faced fabrics in combinations of color and general effect, adapted to that class of goods.

It is thought that plaid effects will be in demand as well as other small neat effects. One thing seems apparent, and that is that brown will give way to gray in its variations, smoke and drab shades having the call.

For line shades, inclinations are towards greens, purples, amethyst blue and a few other art colors, and in fine gray goods, art blue and green; the blue somewhat away from the navy, and the greens inclining towards blue will be used.

At the same time, when woolens were in vogue some years ago, the dark neat mixtures and oxford checks were in great demand and may be brought out the coming season.

From the present indications, it appears that a new fabric structure may be put upon the market for

this light weight season, in competition with woolens. In such a case, it is evident that it will have to be a soft handling fabric of the unfinished variety, produced posisbly by the use of a softer spun worsted yarn or a combination of woolen and worsted yarns, and it is upon this, that a number of mills base their hopes for success this season.

A Review of the Dress Goods Trade.

The absolute quietude which reigns in the dress goods market is sufficiently marked to be commented upon. There are a few, however, who claim that a semblance of improvement is presenting itself.

The demand has been mostly for worsted warp broadcloths and fine cheviots. A number of houses are showing particular good values in cheviots at $1.05 a yard. From the way the heavy weight market opened on the rough goods, it was thought that they would carry all before them. This conclusion it appears was overestimated, as their popularity has quickly lost favor, and the situation is rather complex.

Plans are being developed slowly for the spring 1911 season, and some materials and patterns have been decided upon already, mill agents considering a discussion of the subject a little premature. One thing is sure, and that is that rough goods will have little show, the present season having been too much for them.

Gray overplaids which are so popular in men's wear, will also be in demand for this season.

One of the features of the 1911 season will be a voile which a prominent manufacturer of worsted dress goods expects to place on the market, which he claims will be equal to any made abroad.

A Review of the Silk Trade.

The silk trade seems to be still enshrouded in a mystery of doubt as to which way to turn. The diversified line of goods that is being shown by silk manufacturers for the next fall season, and the various opinions that are being expressed regarding the fabrics that are likely to prove the best sellers, show more than anything else, the doubt that exists at mill centres, about the coming season.

One thing is apparent, and that is, that the demand for fancies continues strong, and a number of houses have a large amount of orders booked on crepés and plaids, and buyers are finding it difficult to secure deliveries on these lines. Several mills have booked enough orders on these two lines to keep all their available machinery in operation for some time to come and are declining to accept any additonal contracts for deliveries earlier than August 15th or September 1st.

The neat gray effects are regarded as *the* thing, and not only the light colors but the darker tones in new and novel patterns seem to be given consideration that is encouraging to the manufacturers.

Some of the keenest observers in the market are of the opinion that plaids, warp prints and Persian designs will be among the silk fabrics having the demand next fall. The fact seems to be further strengthened by reason of the proportion of interest that has manifested itself in these lines, and of the amount of advance orders that have been booked.

The first two lines appear to have the better of the Persian designs in the bid for favor, as the latter have enjoyed a fairly good run during the current season and may for this reason be not as successful as the other two. While this is one way of looking at this question, yet a number of manufacturers look at it from the other side, and claim that it will share equal favor with the others for costumes, as it has been used only for trimmings this season.

It is noted that manufacturers equipped to produce these fabrics, are making preparation to meet the expansion they feel will come during the fall season.

The demand for satin brocades is expanding, and it is thought by a number of manufacturers that it will be used to a great extent for both dress and lining purposes this coming season.

The general inclination of the trade towards these specialties is giving great encouragement to mills making this class of silk piece goods, as they claim that competition is not as keen as on the plain goods, which in many instances have to be sold on a very narrow margin.

A steady trade seems to be had on black taffetas which are being sold in many cases at remarkably low figures. This seems to explain the success some concerns are having while their competitors are all but idle. The largest transaction that is known of is one of 1700 pieces, 36 inch black taffeta, and the purchaser is offering the stock at 57½ cents a yard.

The general demand for velvets for fall delivery is very good and encouraging prospects are in view, basing the conclusion on the business that has recently been booked in this line.

Among the tie silk trade a very encouraging outlook is apparent. For several seasons past, the knitted tubular fabric has found great favor, but it seems that the crest of popularity has been reached and the demand will again be for the flat silk tie.

This conclusion is further strengthened by the fact that the mercerized cotton effects that pass for silk, and cheap knitted silk scarfs are having very little demand, and at the best, attained but an uncertain standing.

Taking everything into consideration, the tie silk industry, it is thought, will be well employed before many months have passed.

Labor Saving Machinery.

Keen competition in the textile trade makes it necessary that the manufacturer installs machines capable of reducing the cost of production.

It is in this direction that a number of the more progressive manufacturers turn to *Jacob K. Altemus,* of 2824 N. 4th. Street, Philadelphia, who has attained a reputation for designing and constructing machines for overcoming the difficulties.

One of the latest machines turned out from this shop, is a machine for splitting mercerized warps, the machines being in two sections, one for plaiting and the other for coiling.

The Altemus winder for the sweater trade, has found rapid success, using the bottle bobbin for winding woolen and worsted yarn.

Another successful line of machinery built by Mr. Altemus is Rolling Machines in all varieties, from such as used in connection with cocoa matting, duck and similar lines of heavy goods to those for tape and other narrow-ware fabrics.

Tension and Cleaning Device for Silk Quillers.

This ingenious device can be conveniently placed upon any style of quilling machine, permitting ready adjustment to exert any desired degree of drag on the thread to be wound, also providing means whereby any loose ends or waste of thread or broken strands are gathered during the process of winding and prevented from passing to the quills, along with the thread proper. It is claimed that a quiller having the new device applied thereto, can be run at a greater speed, hence increase in production per spindle to the throwster.

To more clearly explain the construction and mode of operation of this device, the accompanying plate of illustrations are given, and of which Figure 1 is a perspective view of that portion of a quilling machine, to which the new device more particularly refers, illustrating also the application of the latter. Fig. 2, is a detail view of the plush roller. Fig. 3, is a cross section on the line x-x of Fig. 2. Fig. 4 is a similar view, illustrating a modified form of roller. Fig. 5 is a horizontal section on the line y-y of Fig. 6. Fig. 6 is a section on the line z-z of Fig. 5. Fig. 7 is a detail view illustrating the passage of a thread through the forked or slotted member. Fig. 8 is a detail view of a modification of the device shown in Fig. 7.

Numerals of reference accompanying the illustrations are selected to correspond and indicate thus: 1 designates the body part of a quilling machine, to the brackets 1^a of which are fastened, by adjustable clips, standard 3, which have bearings 4 to receive the ends of a roller 5, the bearings 4 being clamped by bolts 4^a to hold the roller 5 stationary. The latter is covered with plush 6. Blocks 7 are secured to the roller 5 at desired intervals, and are provided with slots 7^a, covered with plush 8. Blocks 7 are secured to the roller 5 by screws 9.

10 represents the bobbins, containing the silk to be rewound on quills, said bobbins being held either on vertical spindles 11 or in a horizontal position by supports 12 secured on rod 1^d of the quilling frame. From these bobbins 10 the thread 15 is passed around or over adjusting glass rods 2, after which the thread is passed over the roller 6 and through one of the slots 7^a to the quills or bobbins.

Instead of taking the thread from bobbins 10, the same may be taken from a swift 13, supported on the bar 1^c on supports 14.

TENSION.

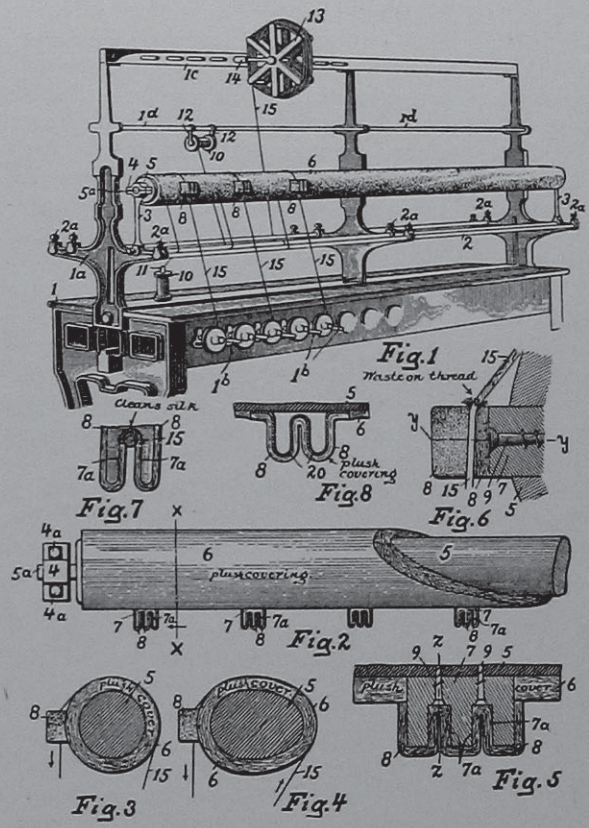
The rods 2 are carried by clips 2^a which are adjustable in the brackets 1^a so that they may be shifted along the brackets to bring the thread 15 into greater or less contact with the surface of the roller, as conditions may require, and thus increase or decrease the drag as desired.

The contact of the thread 15 with the surface of roller 6 may be also adjusted or varied by making the roller 5 of oval or other similar cross sectional shape, as shown in Fig. 4, and when then by turning the roller on its axis, a greater or less tension on the thread 15 may be had.

CLEANING.

By passing the thread 15 through the slots of the member 7, any loose particles of thread will be prevented from passing through the slot, as shown in Fig. 7, to the quills or bobbins on the take up spindles 1^b of the quilling machine.

The thread which passes to the quills will be cleaned, as it were; but furthermore, by providing the slotted member 7 for the thread to pass through, should the thread consist of more than a single strand



and one or more of such strands become dropped from the full thread, then the slotted member 7 will act as a catcher and hold or break the thread and thereby prevent imperfect threads from passing onto the quill.

In Fig. 8 a slight modification of the new device is shown, the block 7 being in this instance formed of a resilient spring-like member 20 covered with plush 8, so as to more readily grip the thread 15, to break the thread, or hold it tight.

NET SILK YARN CALCULATIONS.

By J. H. Fitzgerald.

(Continued from page 107.)

Comparison of Denier and Dram. As thrown silk is counted by both the dram system and the denier system, the former being used more in this country and in England, the latter in the other European countries, it will be of interest to make a comparison of the dram and the denier. Comparing the denier system with the dram system will be an easy calculation, from the fact that both are based upon the principle that the grading in either system varies by a given standard length,

the counts increasing in number, correspondingly to a thicker yarn.

DENIER VICE VERSA DRAM. Since the length of one denier, according to the system adopted by the London Silk Conditioning House, is 520 yards and 20 inches, and there are 8530.5549 deniers to the pound avoirdupois, there will be 520 yards, 20 inches (520 $\frac{5}{9}$ yards) $\times$ 8530.5549 or 4,440,628 yards (in round numbers) of 1 denier silk in a pound. By the dram system, a 1 dram silk contains 256,000 yards to the pound, therefore, if we divide the number of yards of 1 denier silk in one pound by the number of yards of 1 dram silk in one pound, we will obtain a figure, or *constant*, which will express the relation of the units of the two systems. Thus 4,440,628 $\div$ 256,000 will give us 17.346, or in round numbers 17$\frac{1}{3}$, therefore 1 dram count is equal to 17$\frac{1}{3}$ deniers count.

To find the number of deniers count in any given dram count, we multiply the dram count by this constant 17$\frac{1}{3}$.

For example, what is the denier count of 3 dram silk? 17$\frac{1}{3}$ $\times$ 3 = 52. Answer 52 deniers count.

DRAM VICE VERSA DENIER. To reduce deniers count to dram count, this constant 17$\frac{1}{3}$ will also be used, and since 17$\frac{1}{3}$ deniers count equals 1 dram count, to find the dram count from the deniers count, divide the deniers count by 17$\frac{1}{3}$.

For example, what will be the dram count of 35 deniers silk? 35 $\div$ 17$\frac{1}{3}$ gives us 2, plus a small fraction, therefore we take the even number 2. Answer 2 drams count.

CONSTANT. The constant here given, 17$\frac{1}{3}$ or 17.346, is slightly different from the official constant given by the New York Silk Conditioning House and which is 17.366. This difference is explained by the different values given to the various weights and measures used, the meter being taken here as equalling 39.37 inches. The difference is so small as to be a negligible quantity in practical work, but if desired, the decimal number can be used instead of the number 17$\frac{1}{3}$ given.

The average limits within which silk fluctuates in the market is: Raw silk, 9 to 30 deniers, Organzine, 18 to 34 deniers, Tram, 24 to 60 deniers; however, these limits are not fixed, and vary in either direction, depending upon the origin of the silk. Italian silk spins to the finest count, is the most carefully reeled raw silk brought in our market, hence commands the highest price of any silk. Japan comes next in value, the better grades of it being a close competitor to Italian silks. Canton and Chinas are of less value.

It is claimed that the individual cocoon filament in raw silk reels about 2$\frac{1}{4}$ deniers, consequently the number of deniers in the single thread is somewhat more than double the number of cocoon filaments used in the formation of the thread; thus, if six cocoons are reeled together, a single of (2$\frac{1}{4}$ $\times$ 6 = 13$\frac{1}{2}$) practically 13 deniers will be the resulting silk thread.

The Ounce System. Another system of grading silk as to their counts is the ounce system, which system however, is only used in connection with trades other than weaving or knitting, and where heavy counts of yarn are used. This system of numbering silk is based upon the weight of 1,000 yard hanks, expressed in ounces. For example: a 1,000 yard hank weighing 2 ounces is called a 2 ounce silk, etc.

By its very nature, raw silk is an article which is capable of lending itself successfully to misconception or deception. Its weight varies according to climatic conditions. In rainy weather, for instance, the same silk will automatically increase in weight as much as 3 per cent over its weight in ordinary dry weather. Because of its power to absorb moisture, its weight can be still further increased through artificial means, as much as thirty (30) per cent.

Silk *conditioning*, so called, determines the absolute dry weight of silk, and to this weight so ascertained. eleven (11) per cent is added as the universal standard to represent the usual absorption of moisture from the normal atmosphere.

When buying a specified lot of raw silk, it therefore becomes important to know the true amount of fibre and of atmospheric moisture, respectively, contained in the lot. Not to know the conditioned weight of the silk you are buying, means for you to risk from five to ten or more cents per pound on your purchase.

AIR CONDITIONING FOR TEXTILE MILLS.

(*Continued from page 86.*)

Automatic Humidity Control.

The successive stages in the development of any art or science are gradual. Many observant men may have noticed a fact in nature or in manufacture, but it has waited for one man to take hold of it vigorously, or he may have stumbled on an idea; in either case that one man proceeds to develop or build on that particular fact or idea, or there may be several men at work on the same fact or idea and they develop it on different lines. But the general public accepts the new departure slowly. After the public has gradually become convinced that an idea or machine is good under certain conditions, it is often assumed that it cannot have too much of the good thing and then it requires time again to realize under just what conditions that thing is good.

This is the usual course, and it has been exactly the course of development as to humidification in cotton manufacturing and other industries. Intelligent observers knew that different atmospheric conditions made great difference in how their work would run, but the idea of artificial humidification was only accepted slowly by mill men, while now it is generally accepted as a necessity. The average carder, spinner or weaver, having accepted the idea that humidification is a good thing, is apt to think that he cannot have too much of a good thing and then runs his humidifiers when he had better not, for too much humidity is as bad as too little.

This state of affairs calls for the automatic control of moisture supplied, and to meet this demand, Mr. John W. Fries has devised and has patent pending on an attachment to his well known *Hygrosso* Humidifier, which has the merits of efficiency, simplicity and moderate cost.

The accompanying illustration Fig. 14, shows the Motor driven Hygrosso with automatic regulator attached on the upper part of the frame. The small well shown contains an inclined nozzle which communicates with the water supply pipe. The lower part of this well is provided with an elongated tubular opening adapted to receive the water from the nozzle when not otherwise prevented. The water received in the

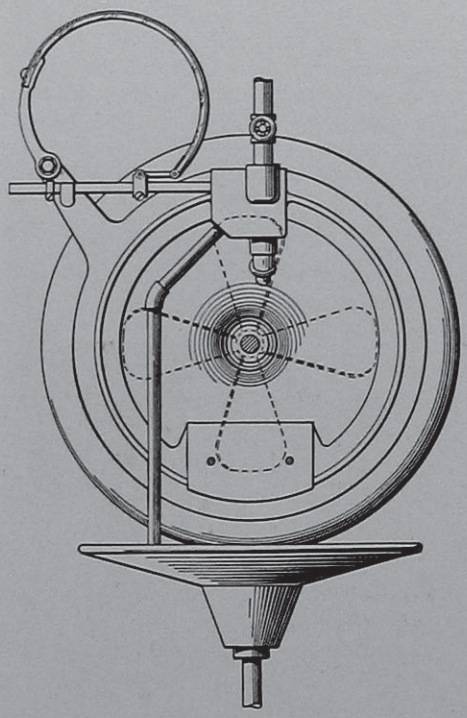


FIG. 14.

tubular opening flows downward into the pipe which delivers the water to the Humidifier. The tubular opening in the bottom of the well is of less width than the well so as to form a space which receives the stream of water from the nozzle if the valve be opened too much. This prevents any possibility of supplying too much water to the Humidifiers and cause what is generally termed *wetting down*. Any water passing from the nozzle which does not find its way into the tubular opening, is received in the well and carried off by the overflow pipe. A reciprocating bar is provided on its end with a water diverting head and adapted to be moved to contact with the stream of water issuing from the nozzle in small well whenever it is desired to divert the water from falling into the tubular opening. This action reduces or cuts off entirely the water supply to Humidifier, and the instrument is set so this will take place when the relative humidity is at the desired point. This diverting head and bar is restricted in its movement by an adjustable stop. This adjustment is made so the head may move in front of the stream of water just sufficient to divert it. The reciprocating bar is moved by means of the expansion and contraction of the curved proportion which is connected to the bar by means of a lever. This curved portion is of compound construction having an outer band of brass and an inner curved part of wood. Wood parts are sawed with the grain running substantially at right angles to the outer edge of strip which makes the device very sensitive. The expansion and contraction of the curved portion is effected entirely by changes in the hygrometric conditions of the atmosphere, so the instrument may be set to have the reciprocating bar divert water supplied to Humidifier at any percentage of relative humidity desired. Once set, it requires no further attention and is remarkably accurate and sensitive, regulating the water supply to humidifier in response to the slightest hygrometric changes.

The Hygrosso is the only humidifier with automatic control where each head is a complete unit and can be adjusted to control the humidity in its own 20,000 or 25,000 cubic feet of air space. It matters not how many Hygrosso Humidifiers there may be in a room; they can be set so the humidity will be uniform throughout the room, or different parts of the room may be independently controlled.

GRANITE WEAVES OBTAINED BY MEANS OF FOUR CHANGES.

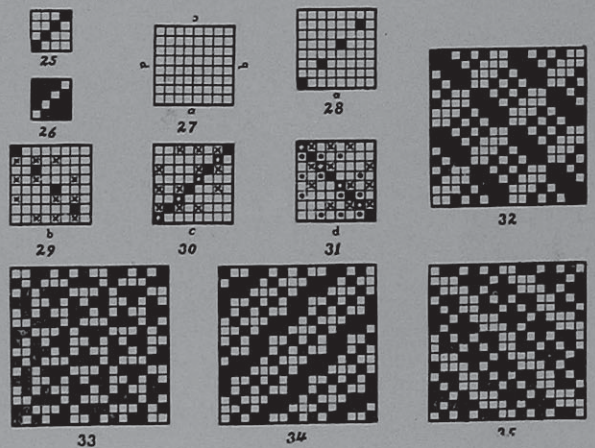
(*Continued from page 96.*)

We next give, by means of weaves, Figs. 25 and 26, and diagrams 27, 28, 29, 30 and 31, the construction of a granite weave obtained from the two uneven sided 4-harness twills.

Fig. 32 shows the granite weave obtained, executed in one color, two repeats warp and filling ways being given.

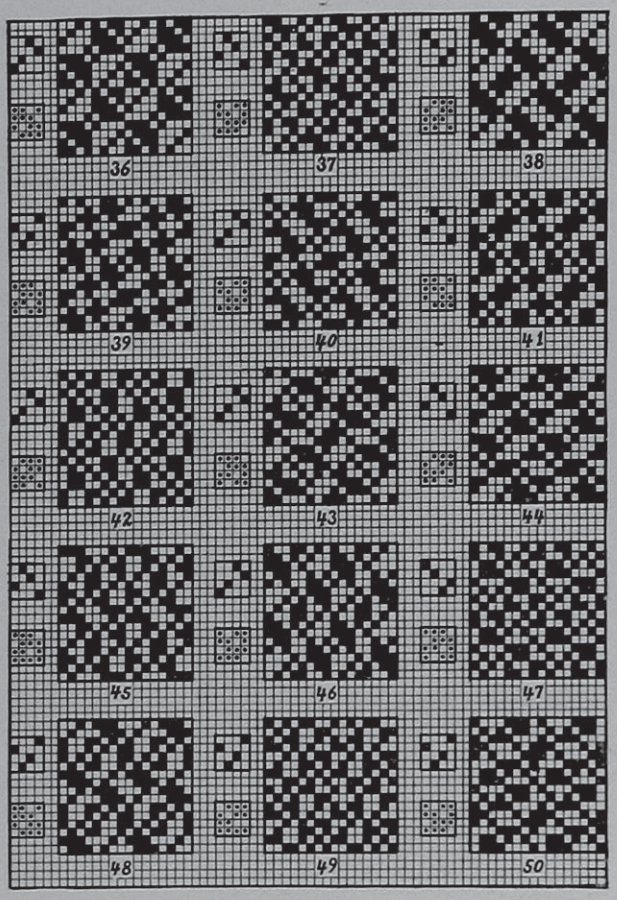
Weaves 33, 34 and 35 show three other granite weaves obtained by means of drafting by four changes from these two uneven sided 4-harness twills; the latter are used for constructing the respective weave in a different position in every instance, with reference to starting the weave.

In order to show the endless variety of granite weaves possible to be constructed from simple foundation weaves, the accompanying plate of fifteen granite weaves, Figs. 36 to and inclusive 50, are given, using in every instance the combination of the two uneven sided 4-harness broken twills for their foundation.



In every instance we placed these foundations in a different position with reference to their point of starting, as shown on the left of each granite weave, and where the two said 4-harness broken twills are

given in their position as they were used with reference to drafting when starting the respective granite weave.

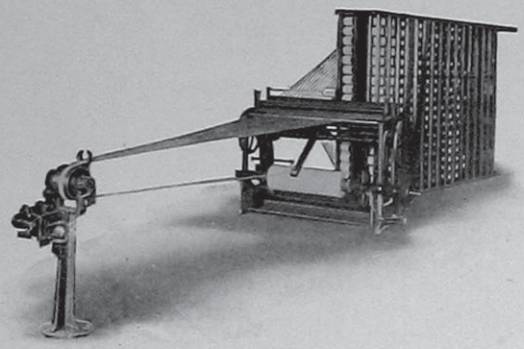


Every one of the fifteen granite weaves given is a perfect weave, for use in every day work.

(To be continued.)

Improved Warping Machinery.

Cotton mills are beginning to recognize the fact that their equipment lacks a valuable piece of cost reducing machinery, unless they have a new style spindle driven Ball Warper, as built by the Globe Machine & Foundry Co., of Frankford, Philadelphia.



These Ball Warpers known as the Denn Warpers, have recently been installed in many of the Southern mills.

The Cliffside Mills of Cliffside, N. C., recognized the advantage of such machines to such an extent, that they have installed seven machines, while the *Trenton Cotton Mills* of Gastonia, N. C., have installed two, and the *Shaw Cotton Mills, Inc.,* Weldon, N. C., have installed three; the *Clara Mfg. Co.,* Gastonia, N. C., the *Elmira Cotton Mills Co.,* of Burlington, N. C., and many other prominent mills have installed this machine.

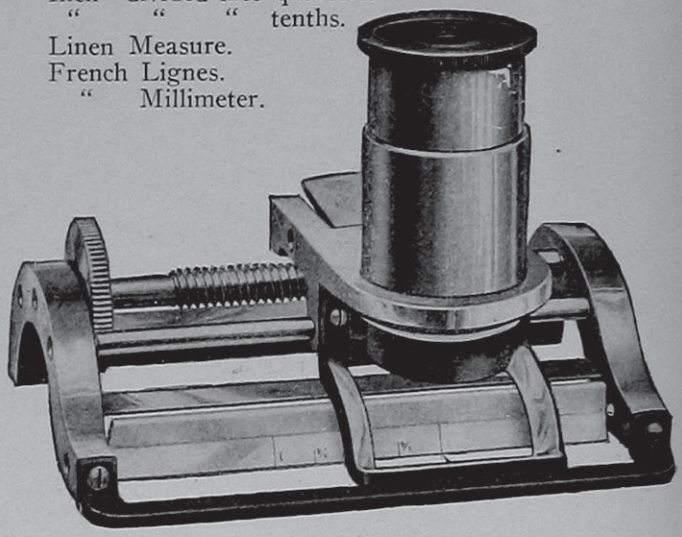
For the convenience of mills who are taxed for space, the Globe Machine & Foundry Co., are now building a "Combined Section Warper with the new spindle driven Ball Warper," a feature which enables every cotton mill which has been unable to install machines on account of lack of space, to take advantage of the opportunity offered.

Lowinson's Triplex Thread Counting Micrometer.

Manufacturers and users of textiles will be interested in this new device for the counting of threads in fabrics.

The instrument is equipped with five different scales of measurement, viz.:

Inch—divided into quarters.
" " " tenths.
Linen Measure.
French Lignes.
" Millimeter.



These different measurements are on a revolving scale, any of which can be instantly turned to.

It is also equipped with three mirrors attached to the lens so that light is afforded while counting.

The threads are counted by a projecting needle, so arranged that it does not hide the scale,—thus overcoming the most serious defect of similar instruments.

A novel feature of this device is a lever, which, when pressed, releases the lens, thus enabling the needle, mirrors and lens to be brought back to the starting point immediately.

A slight conception of the power of the lens can be realized in the fact it magnifies 250%.

This instrument has been successfully introduced in the various textile trades. It has been adopted by the Board of U. S. General Appraisers, and by the Appraisers of the Ports of New York, Chicago, New Orleans and Providence. It has also been adopted by the Quartermasters' Dept., Phila., for the examination of goods purchased by the U. S. Government. It is also in use in the Dept. of Agriculture, Bureau of Chemistry, Washington, D. C.

Mr. Chas. Lowinson, 395 Broadway, New York City, is the agent for the triplex micrometer in this country. He has recently secured patents for the instrument in all foreign countries.

THE JACQUARD MACHINE.

(*Continued from page 74.*)

No matter what make of a Jacquard machine is used, the principle of operation is identical.

To illustrate the principle of the construction of a Jacquard machine, the accompanying illustration Fig. 1 is given, the same being a section through the working parts of the machine, showing one row of hooks and their respective needles, with such parts of the machine as the latter are more closely related with. The frame of the machine is not shown.

of said needles in their places. Below the upper crook of the hooks, the griff bars are shown in their section. *w* indicates the rest for the lower crooks of the hooks, which keeps the latter in their required position.

A study of this illustration will show that when the heads of the needles, *a—b*, are pushed backwards, in the direction of arrow, the hooks are also moved. If the needles are not pushed, the upper crook of their mate hooks will remain in position, as in drawing, over its griff bar; raising the griff will in this case raise every one of the hooks. Therefore, if a blank card is pressed against the needles of the machine, all the needles and hooks will be pushed back, and the crooks of the latter consequently out of the way of contact with the griff bars, thus causing an empty lift when the griff is raised; whereas, by pressing against the heads of the needles with an empty cylinder, or with a card containing as many holes as the machine has needles, and so placed that the holes are exactly opposite the needles, none of them would be moved, and each hook would remain with its crook vertical over its mate griff bar; when raising the griff every hook of the machine will be lifted. It will thus be seen that any variety of shedding, within compass of the size of the machine, can be made by punching cards to suit a given design.

Joseph Marie Jacquard

Examining the illustration, we see a number of upright hooks *e, f, g, h, i, k, l* and *m*. Each hook passes through a loop *v* of its mate needle. In connection with all high textured machines, this loop is changed to a simple U-bend in the wire for holding and operating its mate hook, permitting, at the same time, a more easy removal of needle or hook, provided such an affair becomes necessary for one reason or the other.

Said needles *a—b* rest with their heads in the needle board c—d, extending outside, towards the cylinder, for about ½ inch. The rear part of the needle (its loop) is passed between two bars of the spring frame *r, n, p,* and *s,* and held by the latter in position with sufficient play for a longitudinal to and fro motion, for being pushed towards their springs, releasing said pressure returning the needle again to its initial position. A pin *o* is inserted through the loops of each vertical row of needles so as to hold the springs

To illustrate the rising and lowering of the hooks by the griff bars. diagrams Fig. 2 and 3 are given. In the same, *a* indicates the eight hooks of one row of a 8-row deep Jacquard machine (400 machine, for example used); *b* are their mate needles; *c* the needle

board; *d* the spring box, and *e* the eight bars of the griff.

Fig. 2 shows us the result of using a card in which every other hole (in the depth of card) has been cut,

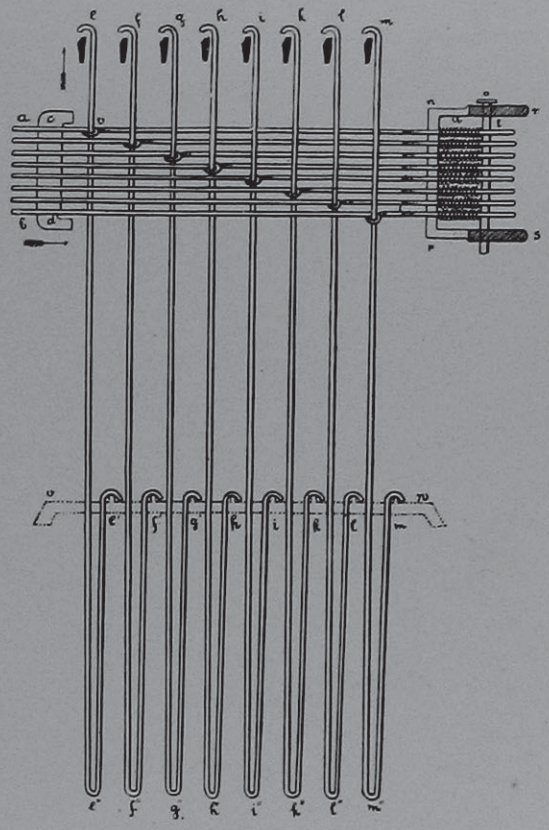


Fig. 1

in turn leaving the needles which enter the card and the cylinder, by means of these holes as stamped in the card by a *Royle* Piano Stamper or one of their Repeaters, undisturbed, and in turn also its mate hooks (see hooks 1, 3, 5 and 7).

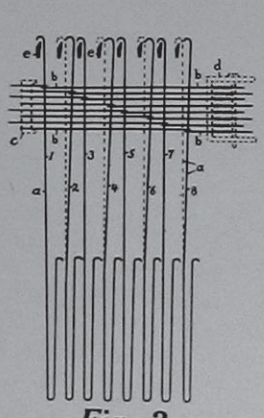


Fig. 2

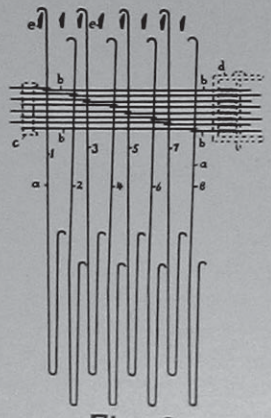


Fig. 3

Needles pushed back, by means of their heads coming in contact with the solid portion of the Jacquard card, in turn push their mate hooks sufficiently far back so that the griff bars, upon raising, will not come in contact with the crook of such hooks (2, 4, 6 and 8), hence the latter will not be raised upon ascent of the griff. The initial position of the hooks in the machine is shown in our illustration by dotted lines.

Fig. 3 shows us the griff bar raised, in turn raising every hook which had its mate needle not pushed back by the Jacquard card (1, 3, 5 and 7); every other hook is at rest, *i. e.*, down. The difference between the position of these hooks (raised or at rest) forms the shed of the warp for the shuttle to pass through, in turn raising or not raising the respective mate warp threads.

Fig. 4 illustrates one of the hooks in detail: *a* upper crook for engaging with griff bars; *b* lower crook for engaging with the rest, and holding needles in position in the machine; *c* neck of hook, and to which the neck cords are attached.

Fig. 5 shows us a needle: *a* its head; *b* its eye (or a U-bend in place of it) for holding its mate hook; *c*—*d* its loop.

Fig. 6 illustrates the top view of a griff, showing eight griff bars (1 to 8) corresponding to the number of needles in one row deep of the machine. Apertures *a*, *b*, *c* and *d* are provided for screws, to fasten griff to the heads of the two plungers (one on each

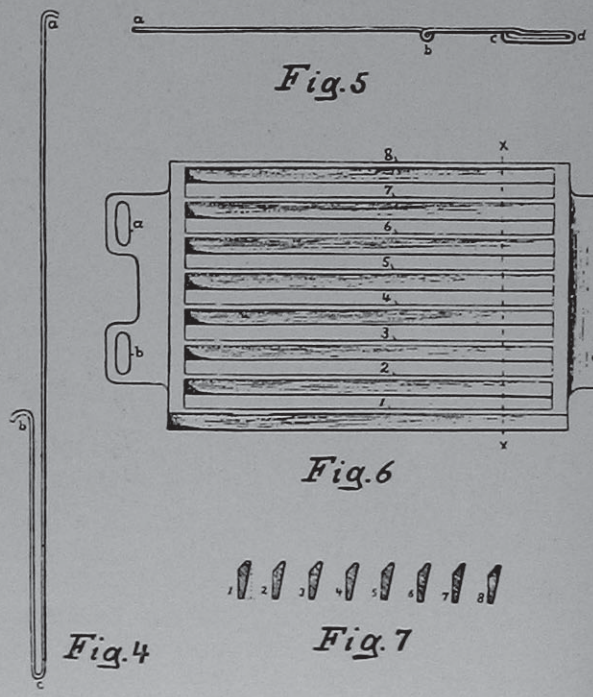


Fig. 5

Fig. 6

Fig. 4

Fig. 7

side) of the machine.

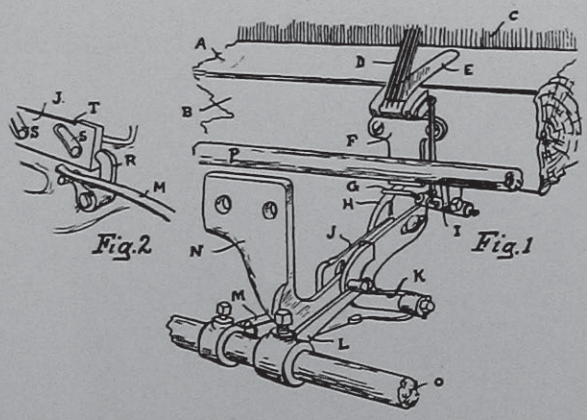
Fig. 7 is a section of the griff taken on dotted line *x*—*x* of Fig. 6.

The griff, by the working of the machine, is raised and lowered on every pick, in turn raising the desired hooks with their mate neck cords, harness cords, heddles, lingoes and warp threads as are threaded to the mail or eye of each heddle. The griff, in its up and down motion, is guided by two plungers (one on each side) working in suitable guides, cast in the framing of the machine. The lifting of the griff is accomplished either from above or below, by means of a suitable lever arrangement.

(*To be continued.*)

STOP MOTIONS.

We will take for our present subject the well known *"Knowles Centre Stop Motion,"* having for this reason prepared the accompanying two illustrations, of which Fig. 1 is a perspective view of the



complete motion, and Fig. 2 a view in detail of the sliding shield tumbler, its spring and the sliding shield, seen from the other side compared to view given in Fig. 1.

Letters of reference accompanying the illustrations indicate thus: *A* the race plate, *B* the lay wood, *C* the reed, *D* the feeler wires, *E* the slot in the race plate and lay into which the feeler wires drop when the lay comes forward, *F* the feeler stand, *G* the dagger, *H* the cam on which the dagger *G* slides so as to raise and lower the feeler wires, *I* the dagger socket, *J* the sliding shield which prevents the dagger *G*, from knocking the loom off on the first pick after the shipper handle is pulled on; *K* is the tumbler, which, when struck by the dagger, throws off the shipper handle, *L* is the tumbler finger which connects the tumbler with the shipper shaft, *M* the shield spring finger, *N* the breast-beam stand, *O* the shipper shaft, *P* the protector rod, and *R* the sliding shield tumbler. The latter, with the aid of the spring *M* throws the sliding shield *J* up to the end of the slots *S*, when the shipper handle is thrown off, and holds it up until the dagger comes in contact with the notch *T* and pushes the shield back on the first pick after the handle is pulled on.

As the lay moves back the feeler wires are raised by the dagger *G* sliding up the cam *H*, to allow the shuttle to pass under them. If there was no filling under the feeler wires when the lay came forward, the dagger would slide down the cam *H* and strike against the tumbler *K*, in turn throwing off the shipper handle, but when the filling is under the feeler wires the dagger is held up so that it cannot slide down the cam and strike the tumbler, but instead passes over the tumbler without striking it.

When the loom is stopped and the lay turned back, the filling is apt to get out from under the feelers, so that if it were not for the sliding shield, the shipper handle would be thrown off on the first pick after it was pulled on. This shield is thrown up into place when the shipper handle is thrown off and remains up, preventing the dagger from striking the tumbler until the first pick after the handle is pulled on, and when the dagger strikes the notch in the shield and pushes it back and down, leaving the dagger free to strike the tumbler on the next pick if there is no filling under the feeler wires.

THE DUPLEX CARDING SYSTEM.

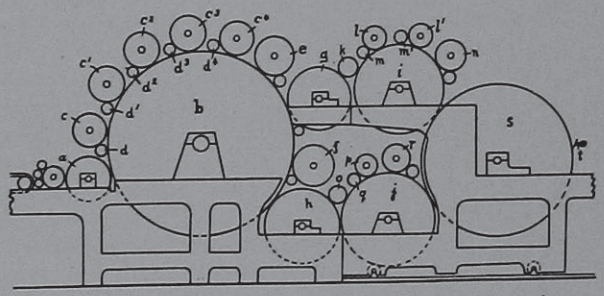
The same refers to a new system of woolen carding, built by John Hetherington & Sons, Ltd., the prominent makers of Textile Machinery of Manchester, England, having for its object an increased production of from 50 to 75 per cent, besides an improved side drawing or roving.

The new system of duplex carding is used in connection with the first breaker or Scribbler, the second breaker or Intermediate card, as well as the Finisher card. In one of their makes of carders, the first and second breaker are connected into one machine, the duplex carding being then only used with the second breaker, the scribbler being, in this combination, of usual construction.

Principle of the Duplex System.

To more clearly explain the same, the accompanying diagram has been prepared; the principle of the operation, number of doffers, swifts, workers and strippers used, being identical for each carder in the set, any difference resting only in the kind of card clothing used.

We will now follow the run of the material through the machine. *a* is the licker-in or feed roller, which feeds the material to the carder, *i. e.*, the material is taken off from the licker-in by the clothing of the quicker revolving swift *b*, also called main cylinder. *c*, c^1, c^2, c^3, and c^4, are five workers, and *d*, d^1, d^2, d^3, and d^4 its five mate strippers; both set of rollers are of the type and arrangement commonly met with in woolen carders.



e and *f* are two fancies. The top fancy *e* is set only lightly with its points of clothing into that of the swift *b*, and raises the fibres which are taken away by the top doffer *g*. The lower fancy *f* is set deeper with its clothing into that of the swift, and in turn raises the fibres remaining in the swift *b*, and which are doffed or taken away by the second or lower doffer *h*, thus taking off the swift two separate and distinct fleeces.

These two fleeces, in turn are again carded separately by two auxiliary swifts *i* and *j*, carrying two and one sets of workers and strippers respectively.

Top Section.—*k* is the transfer roller or feed

roller for feeding film from doffer *g* to *i* the top auxiliary main cylinder, *l* and *l'* are two workers, *m* and *m'* their mate strippers and *n* the fancy.

Lower Section.—*o* is the transfer roller for conveying the film from the lower doffer *h* to the swift *j* of the lower auxiliary carding section. *p* is the worker, *q* its stripper and *r* the fancy of this auxiliary set.

s is the main doffer, which takes up the stock from both auxiliary swifts *i* and *j* respectively. *t* is the doffer comb, operated in the usual manner, and which strips the fleece or web from the main doffer.

The first and second breaker machine delivers, by means of side drawing, to the scotch feed of the next machine, the finisher carder delivering to a four tiered "Josephy" condenser. The number of threads that can be got off a condenser 60" wide, is from 96 to 180, and those from a 72" wide condenser, from 96 to 200, but of course the number of threads taken off depends upon the class of work and the pitch of Mules to follow.

How Increased Production is Obtained.

The increased production (from 50 to 75 %) previously referred to, is obtained by being able to feed heavier. This is possible to be done because the swift *b* is always empty on the surface when presented to the feed rollers, *i. e.*, licker-in, this superior cleaning being accomplished by employing the second (lower) doffer cylinder *h*, using two fancies and two doffers for cleaning the swift *b*, in place of the one fancy and one doffer as used with the regular woolen card at present.

Quality of roving, *i. e.*, superior carding action to the stock is obtained by the duplex re-carding, as carried on by the two auxiliary cardings, and done in connection with auxiliary swifts *i* and *j*, in addition to the first carding as carried on in connection with swift *b*.

An important feature of this Patent Duplex Carder, is the large number of carding points. A two parted set of machines, as shown in illustrations accompanying this Article, have about one third more carding points than an ordinary set of two machines with five main cylinders.

The speed of this duplex card of course varies with the class of material to be carded, the following references giving a fair basis for the carder to work from:

Scribbler:—Breast 80 revs., breast doffer 9 to 12, swift 120, top doffer 7, lower doffer 5, auxiliary swifts 160, main doffer 2.5 to 5.5.

Intermediate and finisher:—Swift 120 revs., top doffer 7, lower doffer 5, auxiliary swifts 160, main doffer 2.5 to 5.5.

The actual production (10 hours) of a set of two carders with tape condensers 60" wide, 120 threads, on low shoddy for serges is quoted by the builders thus:

600 lbs. of 4 cut, or $\frac{3}{4}$ run yarn (condensed).
460 lbs. of $4\frac{3}{4}$ " or $\frac{7}{8}$ " " "
400 lbs. of 5 " or $1\frac{5}{16}$ " " "

The actual production (10 hours) on medium quality dyed wools for Army cloth, using a condenser of 96 threads in 60", is quoted by the builders thus:

460 lbs. of $4\frac{3}{4}$ cut, or $\frac{7}{8}$ run yarn (condensed).
380 lbs. of 5 " or $1\frac{5}{16}$ " " "

The number of threads possible to be taken off a 60" four tiered condenser is 96 to 144, depending on the class of work and the pitch of Mule to follow.

Process for Preventing the Tendering of Cotton Dyed with Sulphide Colors.

By George E. Holden, A.M.S.T.

In introducing my subject, it should hardly be necessary to point out the uncertainty that has existed, and exists even to-day, in the use of the sulphide class of coloring matters for the dyeing of cotton.

The uncertainty arises in the possibility of the material dyed with the sulphide dyestuff losing appreciably in tensile strength shortly after the operation of dyeing, or some time afterwards. It may be that no tendering of the dyed fibre takes place even after the lapse of a prolonged period, yet it is well known that an alteration of the fibre may take place, and certainly has taken place, with disastrous results, on rather more occasions than most persons interested would care to admit.

In the case of cotton yarns, instances have been made known of tendering having taken place within a few months after the dyeing; that is, a period easily occupied in the goods travelling from this country to some distant eastern port. Other instances have been made known of yarns so dyed showing an unusual decrease in strength after the operation of polishing. In the case of cotton piece-goods, tendering may or may not come into evidence after such operations as schreinering, calendering, or hot-pressing, but in the case of mixed goods containing cotton dyed with the sulphide dyes, tendering almost always takes place after the operation of stoving (sulphuring). Many other instances could be cited.

These general statements with regard to the liability of the sulphide dyestuffs causing the tendering of vegetable fibres dyed with them, are not only known to most dyers, but have been admitted in a public manner in numerous patent specifications of processes for preventing or minimising that fault. All these prescribe an after-treatment of the dyed material with salts, not necessarily alkaline, which are capable of neutralising free mineral acids either by transposition or by forming acid salts.

Of the compounds recommended for this purpose, mention may be made of sulphide of soda, carbonate of soda, soap, and the formates and acetates of the alkali metals.

The subject has been very comprehensively investigated by Mr. Pilling, who came to the following conclusions:

(1) That the cause of tendering was in every case due to the presence of free sulphuric acid in the goods.

(2) That the sulphuric acid owes its origin not to the presence of sodium sulphide, or polysulphide, but

to the oxidation of the color-molecule, or to oxidation of sulphurous acid coming from the outside sources.

Having devoted attention to this subject for some time, I may state that my experiences very soon led me to investigations which confirmed Mr. Pilling's conclusions; and, having satisfied myself that in all the cases of tendered goods which came under my notice in practice, and in laboratory trials, evidence of the presence of free sulphuric acid was plainly shown, I considered the several methods of after-treatment that had been proposed or were known.

Many of these may be efficient enough to a certain extent, but I have found that the protective influence exerted by any of all the processes of after-treatment of which I have any knowledge is somewhat limited.

I believe that I am quite right in saying that all these processes of after-treatment rely for their expected efficiency either on assisting oxidation of the coloring matter absorbed by the fibre by treating with bichromates and acetic acid, or by after-treating with salts capable of neutralising free mineral acids.

From the results of an extensive series of experiments, I was led to the conclusion that the tendering of vegetable fibres, dyed with the sulphide dyes, is due to the formation of sulphuric acid, from one cause or another, the presence of which I was able readily to ascertain and to confirm. I noticed also that under the prolonged influence of a degree of heat no higher than is usually met with in drying over cylinders, in calendering, or schreinering, the rate at which the sulphuric acid is developed on cotton dyed with the sulphide dyes is very notably accelerated. And I take it, that an exposure for about twenty hours at a temperature of 248 deg. F., adequately affords a means of predicting what may happen in the storing of cotton goods, or goods containing cotton, dyed with the sulphide dyes, for an extended period at the normal temperature, or in course of transit through tropical climates, especially through being stowed in close proximity to the ship's boilers.

These observations apply not to any one particular brand or make of this class of coloring matters, but to all that I have met with on the market.

The known methods suggested for securing the fibre against attack from the sulphuric acid eventually formed, possess a common disadvantage in that the salt or compound used for impregnating the dyed material is soluble in water, and is consequently removed, and therefore inoperative when the goods are wetted or are washed.

This is a rather serious drawback for many classes of goods, yet for some it may be serviceable enough within certain limits. From these considerations I sought to fix upon the fibre a compound in an insoluble form which would react quantitatively with the sulphuric acid as it came into existence, and in that way attain a method of effective after-treatment applicable to all classes of cotton goods, and more especially those which would have to pass, at some time or another, through a course of washing or any other process likely to remove a soluble protective agent.

It is perhaps needless to trouble you with details of the course of investigation into which I was led, and I will simply state that eventually I concluded that the conditions which I sought to establish could best be fulfilled by placing a suitable calcium salt upon the fibre in such a form as to be insoluble in water, yet available for reacting at once with the sulphuric acid which might be formed, and, by producing the harmless calcium sulphate, imparting immunity to the fibre against tendering.

I found that this could be attained in more ways than one, and perhaps the simplest consists in taking advantage of the affinity exercised by tannic acid for the vegetable fibres, and also its capacity for combining with a suitable salt of calcium to form a compound insoluble in water yet very ready to unite with sulphuric acid.

Working on these lines I found that by impregnating the dyed material with a solution of tannic acid, followed by a passage through lime water, and washing, the liability of the fibre to tender is very notably minimised.

I have stated, and I believe it is common knowledge, that vegetable fibres dyed with the sulphide dyes may or may not show signs of tendering very soon after dyeing, according to the nature of the finishing processes through which the material may have passed, or some time afterwards by storing, or in any circumstance by being subjected to the influence of elevated temperatures.

Like Mr. Pilling, I accept the hypothesis that heat may be taken as a compensating agent for time, and consequently in all the tests which I am about to bring to your notice I have relied upon an exposure of the dyed samples to a temperature of 248 deg. F., for a period of twenty hours, as representing a fairly reasonable indication of the possible effect of storing for a relatively prolonged period at lower temperatures. It is somewhat remarkable that no great quantity of tannin is required to fix an amount of calcium sufficient to react with the sulphuric acid which in all cases appears to be formed under the conditions which I have named.

For instance, in the case of cloth, after dyeing in the customary manner with a sulphide dyestuff, and washing thoroughly, a treatment for a few moments, with a 1 per cent. solution of tannic acid on the amount of water, at a temperature of about 104 deg. F., squeezing, passing through lime water, and finally washing, suffices to exercise a very pronounced protective influence. Samples of cloth dyed with representative members of the chief sulphide blacks on the market, as well as browns, blues, &c., and after-treated in this manner, and then exposed along with the corresponding non-treated material for twenty hours at a temperature of 248 deg. F., retain their original strength whilst the non-treated undergo a very appreciable loss in tensile strength, and in many cases become altogether rotten.

In the case of yarns, the only variation of the treatment consists in immersing in the solution of tannin for a period of about ten minutes, and the

results in all cases correspond exactly with those reached on cloth.

So far I have not met with a single sulphide dyestuff which does not cause the tendering of the cotton, whilst the precipitation of tannate of lime on the dyed fibre has in every instance prevented the occurrence of tendering.

Other advantages of this method of after-treating vegetable fibres, which have been dyed with the sulphide dyes come incidentally into notice. These include, besides the main one of retaining the original strength of the dyed fibre after an exposure to elevated temperatures, the following:

(a) In many instances adding to the strength to an appreciable extent;

(b) in the case of blacks, decidedly improving the depth and tone to such an extent as may sometimes allow of the use of 10 per cent. less coloring matter to produce a given depth of black, as against no such after-treatment;

(c) adding notably to the weight of the dyed material; and

(d) increasing the power of the dyed material to absorb starches.

In using a tannin as the medium favoring the fixation of an insoluble compound on the fibre, I find that satisfactory results can be obtained by using, instead of lime water, any suitable salt of calcium, barium, or strontium.

In connection with this discussion, there are a number of questions that arise on the subject.

As is frequently done, sulphide colors are topped with basic colors in order to brighten them. In this connection, a question arises as to how the treatment with calcium tannate, either before or after dyeing, would affect this class of work and whether the colors were brightened or fastened by the use of the same.

In connection with this, it has been found that the colors have been somewhat brightened and the basic color has certainly been rendered much faster.

Another question which arises is whether the use of inorganic salts, such as carbonates of calcium and magnesium, along with the tannin, instead of tannate of calcium would act in preventing tendering.

In this connection, it appears that calcium carbonate would act under certain conditions, but magnesium salts are useless.

Another point which comes up for attention is whether cotton, dyed with the concentrated brands of the sulphide colors becomes tender, in as much as these colors contain a much smaller percentage of impurities than the others and the general impression is that they are less liable to tender the cotton.

With reference to this, it is explained that the discussion was based on the use of these concentrated sulphide colors and in most cases the difference between the two was very little with respect to tendering.

In connection with tendering, the question arises as to what amount of sulphuric acid in the bleached yarn would produce appreciable tendering.

This is explained by the fact that exhaustive tests have shown that 0.002 per cent seemed to be sufficient sulphuric acid to produce tendering at high temperatures, whereas at ordinary temperatures up to 0.008 per cent was the danger point.

As to how this process would affect the lustre, handle and feel of mercerised cotton, it is said, there is no detrimental effect on mercerised piece goods.

The use of this process for treating cotton in union fabrics which were stored after weaving was questioned. Tests made on this class of goods have been quite successful, although the strength of the tannic acid had to be increased appreciably.

In connection with the sulphuric acid tests, it is interesting to know the method for ascertaining the amount of sulphuric acid in the fibre.

In working out the tests, in this discussion, the method used consisted: A solution of sulphuric acid of known strength was taken, a weighed quantity of cotton was immersed in the acid and then wrung until it increased in weight by a definite amount in each case, corresponding to the amount of sulphuric acid with which it was desired to impregnate the cotton.

Faults and Defects in Cloth Finishing.

Weighting, when carelessly performed, may result in faults appearing in the finished fabric, which seem to indicate slipshod dyeing. An example of this is seen when one selvedge of the fabric comes up darker in shade than the other.

Speaking in a general way of these defects in a fabric, they are mostly blamed upon the dyer, but may be caused by either faulty blowing previous to dyeing or by dirt settling down into the lower selvedge while draining after roll boiling, etc.

Irregular supply of steam to a rolled piece, whereby one side gets overblown and the other insufficiently, causes one portion to absorb dye in excess of the other, with the result of showing a dark and light side. A very similar effect is produced by running cloth through a weighting solution which has not been properly stirred up. This defect may be cured by washing the cloth with hot water, extracting well in the hydro-extractor and giving it another passage through the weighting bath. Most weighting liquors have a very high specific gravity, and, unless well stirred about, will form heavy layers at the bottom and sides of the bath, and if added to the bath at one side, will take a considerable length of time to diffuse unless assisted by vigorous stirring. Such a cause for producing faults seems so trivial as to be hardly worth mentioning, but nearly all defects and ailments arise in the first instance from some trifling omission, while the task of tracing out the source is by no means easy.

Chalk Marks on Greys.

Some mills are fond of marking grey goods with colored chalks, denoting lengths, weights, qualities and loom marks, to which are frequently added marks by the burlers and menders, who chalk out places where there are missing ends. In the majority of cases these chalk marks disappear in scouring or dyeing, but cases are on record where serious stains have

formed from this cause alone and have been practically indelible. In a case of this kind, the marks had turned to a deep brown nearly approaching black, which of course, showed through in blues and light colors. On investigating the facts, the chalk marks were found to be originally a bright orange red, which on steaming turned dark brown. All reds did not change in this process, but only those of an orange shade, which pointed to differences in the composition of the chalk. On testing the suspected chalk in bulk, it was found that orange chromate of lead entered largely into the composition, which, under the combined action of moisture and heat in crabbing, united with the natural sulphur in the wool fibres to form lead sulphide. The harmless reds were found to be mostly aniline colors with a base of china clay or some other neutral body. For marking grey cloth, the most fugitive dyes are the safest to use in making crayons; basic colors, such as magenta, safranine, methylene blue and methyl violet, are specially suitable. Colors containing lead, iron, copper or chromium, should be avoided.

Chafes.

These faults only appear in fine faced woolens, or in worsteds, and do not show in the rougher cloths. They are always caused by the cloth getting fast either in the washing or the dyeing machine, said abraded appearance being due to the friction of moving rollers on a stationary fabric. For this complaint there is no cure. Thin and fine cloths are the most given to getting fast, and it is these naturally which chafe quickly, as the heavier weights run easier and are kept straight by their weight and bulk. Having too large a bulk of liquor in scouring or dyeing processes is a fruitful cause of this fault, as the fabric then floats about and has every chance of entanglement.

Tender Goods.

Fine wool fabrics are more subject to this defect than such as made of coarser wool, the fault may be due to several causes.

Prolonged boiling will bring it about, as also will severe treatment in decatising; in fact, hot steam blown forcibly through a rolled fabric quickly makes it tender and imparts a papery handle.

Acids are less dangerous than alkalies, especially when hot, but either is likely to tender a cloth if not washed thoroughly out, and alternate baths of acid and alkali are the worst things it is possible to apply, since one appears to aggravate the effects of the other.

Excessive gigging will also weaken a fabric, as this draws fibres out of the threads which would serve to hold it together, while, if decatising follows gigging, the cloth is weakened still further.

Union fabrics lose strength in gigging at a greater rate than all wool cloths, as the wool is the only part which forms cover, and often a union will be sound enough the way of the warp, when that is cotton, and very tender filling ways.

Chrome mordants if used have also a rather weakening action upon cloth, particularly when boiled on without the aid of any assistant such as tartar, etc.

The ideal treatment for wool cloths, if it could only be carried out, is never to subject them to a higher temperature than can be borne by the human skin.

Pipe Blown Places.

The cause of this fault is that of extremely rapid vibration set up by a current of steam. The general custom of heating dye tubs is by means of blowing in live steam, and when the cloth under treatment requires protecting from too close a contact with the steam, by using a perforated wood or metal screen, usually wood so as not to affect the dye.

Under proper working conditions, the vessel is brought to the boil without the fabric coming too close to the entering steam, but should too large a bulk of cloth be handled, it may have a tendency to pile up against this screen, where then there is danger of vibration setting up with the inrush of the steam.

Another cause may be the breaking or enlarging of the holes in the screen, thus allowing steam to enter in a strong current at one spot. However the most commonly met with cause is entering too large a bulk of fabric in the dye tub, with the result that it lies too long on the floor of the vessel before the reel distributes it into new folds. Cure for this fault there is none, but prevention is very easy, as it never occurs in a tub where the circulation of the cloth is quick enough.

Distortion of Pattern and Ends.

To guard against this, the end of one piece is sewed to the one following it so as to keep up a uniform tension, but with very thin and elastic cloth this is sometimes difficult to do.

Badly acting brakes on a cloth entering a drying machine may cause this fault, the cloth being held back more at the selvedges than in the centre, which causes the latter to get in front. Slack or tight selvedges may also account for distortion of design, as in this instance the best of brakes cannot equalise the rate of travel. Bowed ends are very unsightly in a finished cloth; while such figures as squares or diamonds may often be distorted for yards by this cause.

Slipping in the Rolled State.

Upright or perpendicular blowing is usually where this fault occurs, it is also seen in roll boiling in the same position. Slack winding on the roller is the cause, but some fabrics which are very soft and heavy cannot support their own weight when the steam enters, with the result of forming large creases at the bottom of the roll. It is nearly hopeless trying to mend this fault once it appears, and if allowed to cool in this state, it can never afterwards be moved.

The best plan to remedy this trouble, is to rewind the cloth while hot, on to another roller, giving plenty of tension to the selvedges while rewinding, but if the slip occurs while boiling on the roller, it may not be seen until the cloth is lifted out, when then it is too late to correct the trouble.

Curled Selvedges.

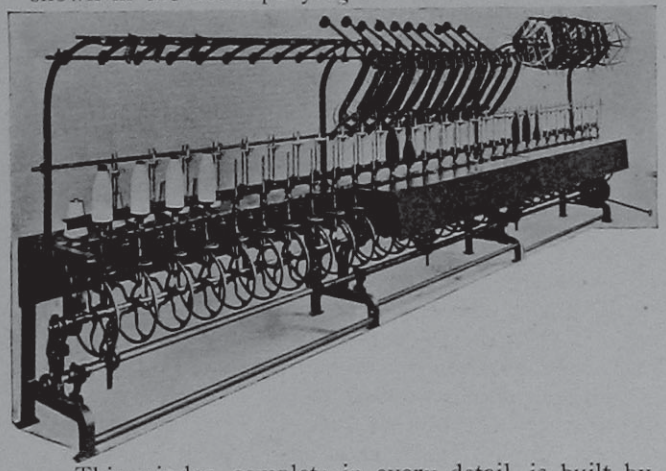
They give much trouble to finishers. The cause originates in the weave room, where the selvedges may have been woven tighter than the body of the cloth. On contact with hot water, the selvedges curl back upon themselves, which prevents the dye liquor from penetrating and also causes much trouble in drying the goods. The only remedy for this defect is to bag the cloth, that is folding selvedge to selvedge until the

cloth forms a long tube and then stitch it in this position, with stitches not less than three inches apart. In this state the fabric may be scoured, dyed and washed, without any risk of curling, but, of course, it cannot be gigged or dried in this form. As a rule, the selvedges curl face inwards and when so, the cloth should be bagged face out, so that the curl of one selvedge is opposed to that of the other. When they curl with the back inwards, which is rare, the bagging should then be done the reverse way—that is, with the back to the outside. The Dyer and Calico Printer.

Winding of Hosiery Bobbins.

The successful and profitable operation of the knitting machine depends to a great extent upon the manner in which the bobbins for supplying the yarn are wound.

There are a number of machines on the market which are used for this purpose, but one which can be depended upon to do the work satisfactorily is shown in the accompanying illustration.



This winder, complete in every detail, is built by the *Oswald Lever Co., Inc.*, of Lehigh Ave. and Hope Street, Philadelphia, and is adapted for handling cotton, silk, woolen or worsted yarns.

The general construction of the machine is such that they are very easily operated, and, on account of the method of building, are very light running, requiring very little power.

The driving mechanism is based on the friction principle, the spindle band being done away with, the spindles being driven by flat discs on the lower end coming in contact with the driving wheel on the shaft.

One of the important features of the machine is that the yarn is made to run at a uniform rate of speed throughout the building of the bobbin, corresponding with the difference in diameter of the large and small parts of the same.

The machines are built in sections of eight spindles up to 60 spindles.

Another feature is the sizing trough and roller which are furnished if desired, it being a valuable adjunct in increasing the production in the mill. The object of this sizing process is to lay the fibres protruding from the yarn, reducing the friction on the needles, and allowing the yarn to slide over them freely. This attachment is not shown in the illustration.

Further information may be had from the builders who will go more into detail in the matter, should the mill be in need of machinery of this class.

The Reinforced Garter Welt.

One of the improvements that is being made in the production of hosiery, brings to attention the fact that there is a tendency for the hose, especially among the finer grade, to tear or rip at the top, caused by the use of the garter clip. This is especially noticeable in women's hose; and in order to overcome it, some manufacturers are knitting an additional garter welt, about four inches below the customary welt top. This, as can readily be seen, gives an increased strength to the top of the hose, in as much as the strain is concentrated on the reinforced parts; the increase in price of production is comparatively little.

Another idea consists in reinforcing the top of the stocking about five inches down from the top, by running an extra course, one inch wide and one and a half inches long, on opposite sides of the stocking, forming a strong support and relieving the stocking proper of the strain.

A garter top hose is also made which adjusts itself to the shape of the leg, the top being made very stiff and elastic, somewhat after the principle of the glove band, any additional support being unnecessary.

How Manufacturers are Saving Money.

A number of mills are realizing that a considerable loss occurs in buying old rags for wiping the grease and dirt from the machines, and are following the movement of the more progressive mills in using the silk wiping cloths manufactured and supplied by Harry Crowther of *D* and Ontario Streets, Philadelphia.

By the system of Mr. Crowther, the mill is supplied with these wiping cloths, so prepared as to absorb the grease and dirt, and when they are dirty are returned to him for washing. At the time he is notified of the shipment, he expresses the mills a number of clean cloths equal to those they are returning; in this way the mills are always assured of having an ample supply of perfect, clean cloths ready for use.

This service is supplied at a certain sum for a stipulated time, and from a financial, as well as a productive standpoint, should be used in every mill in the country.

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BUYERS' INDEX—Continued

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Buhlmann, A. W.
Curtis & Marble Machine Co.
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Johnson, Van Vlaanderen Machine Co.
Klauder-Weldon Dyeing Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Textile-Finishing Machinery Co., The
Woolford, G., Wood Tank Mfg. Co.
Woonsocket Machine & Press Co.

Dye Sticks.
Haedrich, E. M.

Dyestuffs.
American Dyewood Co.
Cassella Color Co.
Chemische Aniline Works.
Farbenfabriken of Elberfeld Co.
Klipstein, A. & Co.
Metz, H. A. & Co.
Scholler Bros. Co.

Dynamos & Motors.
Sipp Electric & Machine Co.

Electrical Warp Stop Motion.
Mossberg Wrench Co.

Engineers.
Fernbach, R. Livingston.
Helick, Dr. Chauncey G.

Feeding Machinery.
Harwood, Geo. S. & Son.

Filters
Hungerford & Terry.

Finishers.
Firth & Foster Co.
Schwarzwaelder Co., The.

Flyers, Caps and Tubes.
Calder Machine Works.

Fulling Mills.
Hunter, James, Machine Co.

Grids for Lappers.
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Harness Builders.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.
Lentz, F. G & Co.
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Steel Heddle Mfg. Co.
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Ulrich Company.
Whitaker Reed Co.

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Hotel Cumberland.

Humidifiers.
Fries, John W.

Hydro Extractors.
Dienelt & Eisenhardt, Inc.

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Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.

Jacquard Card Stamping, Lacing and Repeating Machinery.
Royle, John & Sons.

Knitting Machinery.
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Climax Machine Co.
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Mohair.
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Napping Machinery.
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Howson & Howson.
Keystone Law & Patent Co.

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Schwarzwaelder Co., The.

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Ulrich Company.
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Whitin Machine Works.

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Maywald, Frederick J.

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Troemner, Henry.

Sewing Machines.
Singer Sewing Machine Co.

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Buhlmann, A. W.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.
Johnson, Van Vlaanderen Machine Co.
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Sipp Electric & Machine Co.
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Ryle, William, & Co.
Sauquoit Silk Mfg. Co.
Suter, A.
Villa, Stearns Co.

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Holbrook Mfg. Co., The.
Scholler Bros. Co.

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Spinning Frames.
Mason Machine Works.
Whitin Machine Works.

Spinning Rings.
Draper Co.
Whitaker Reed Co.

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Marshall Bros., Agts.
Ulrich Company.

Stop Motions for Looms.
Crompton & Knowles Loom Works.
Draper Co.
Mossberg Wrench Co.

Tanks, Vats and Dye Tubs.
Woolford, G., Wood Tank Mfg. Co.

Tapes, Braids and Edgings.
Chapin, George W.
Weimar Brothers.

Temples.
Crompton & Knowles Loom Works.
Draper Co.

Thread Counting Micrometers.
Lowinson, Chas.

Thread Guides.
Palmer, The I. E. Co.
Whitin Machine Works.

Threads.
Chapin, George W.
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Tinsel.
Littauer, Ludwig.

Twisters.
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Mason Machine Works.
Whitin Machine Works.

Twist Counters.
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Scott, Henry L. & Co.
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Ventilating Fans.
Philadelphia Textile Machinery Co.

Winding, Beaming and Warping Machinery.
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Globe Mach. & Fdy. Co., Inc.
Lever, Oswald Co., Inc.
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Whitin Machine Works.

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Crompton & Knowles Loom Works.

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Hunter, James, Machine Co.
Klauder-Weldon Dyeing Machine Co.
Lever, Oswald Co., Inc.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Speed & Stephenson.
Woonsocket Machine & Press Co.

Woolen Yarns.
Littauer, Ludwig.

Wool Washing Machinery.
Hunter, James, Machine Co.

Yarn Testing Machinery.
Buhlmann, A. W.
Scott, Henry L. & Co.
Sipp Electric & Machine Co.

MILL NEWS

Philadelphia. The Fern Rock Woolen Mills are starting additional looms on orders recently received.

Philadelphia. Richard J. Prince, manufacturer of men's wear and dress goods, Tenth and Diamond streets, are starting up all idle looms.

Philadelphia. The Germania Worsted Mills, dress goods manufacturers, are starting up about forty additional looms.

Philadelphia. The Louis Walther Manufacturing Co., dress goods, are starting up their idle looms.

Philadelphia. Charles H. Feldstein & Co., haircloth, are very busy and running on a day and night schedule.

Philadelphia. The Philadelphia Winding Co., are reported as being exceedingly busy and working overtime.

Philadelphia. Joseph Lomax, manufacturer of ingrain art squares and rugs, Jasper and Orleans streets, is reported to have enough orders on hand at present to keep running to full capacity for the next six months.

Philadelphia. J. W. Landenberger & Co., hosiery manufacturers, Randolph street and Columbia avenue, are operating to full capacity.

Philadelphia. Owen Osborne, manufacturer of woolen hosiery, is running on a full time schedule.

Philadelphia. The Hamill Spinning Co., manufacturers of all kinds of woolen yarns, report that they are very busy.

Philadelphia. John Goodman, manufacturer of ingrain carpets, has moved his entire plant from Front and Columbia avenue to the Bromley Mill, Jasper and York streets.

Philadelphia. The Germantown Spinning Co., spinners of cotton yarn for the underwear and hosiery trade, report business as being very good in underwear yarns, and that they are running full.

Philadelphia. Thomas E. Brown & Son, manufacturers of hosiery, Second and Westmoreland streets, are running full capacity and full time.

Philadelphia. Theo. Abbott & Co., manufacturers of upholstery goods, are reported rushed for delivery of goods, and are operating their looms to full capacity.

Philadelphia. Yewdall & Jones Co., manufacturers of worsted yarns, are running full capacity and full time.

Philadelphia. Upham Bros. & Co., manufacturers of all kinds of sewing thread, are reported as being very busy and running to full capacity.

Philadelphia. The Peerless Silk Hosiery Co., 1839 East Willard street, are operating on a day and night schedule.

Philadelphia. Herbert B. Newton, manufacturer of upholstery goods, is reported as being busier, at present, than at any time during the past two years.

Philadelphia. George W. Lefferts & Co., spinners of worsted yarns for the knitting trades, are running full time.

Philadelphia. The erection of a seven story addition to the plant of the Roxford Knitting Co., to cost $100,000, is being planned.

Philadelphia. Walter Wesendonck, Burns A. Robie and Robert M. Atkins intend to incorporate the Minoru Hosiery Mills.

Philadelphia. The property now occupied by R. J. & R. Ritchie Co., manufacturers of upholstery goods, Orchard and Tacony streets, Frankford, has been sold for $47,500 to Robert Ritchie by the Frankford Trust Co.

Philadelphia. Archibald Holmes & Son, proprietors of the Tuxedo Carpet Mills, are planning the erection of a 35 by 72 foot, three story addition, and expect to equip it with looms and auxiliary machinery during the latter part of August.

Philadelphia. Thomas Wolstenholme Sons & Co., worsted yarn spinners, have purchased a plot of ground, 164 by 400 feet, to enable them to enlarge their plant.

Philadelphia. Albert Walker, James Hulton and A. L. Hampson have incorporated as the Ontario Dyeing Co., capital $50,000. They have bought of the Hulton Dyeing and Finishing Co., the mill buildings at the north east corner Ontario and *D* streets, and will build a large addition to the same.

(*Continued on page xvi.*)