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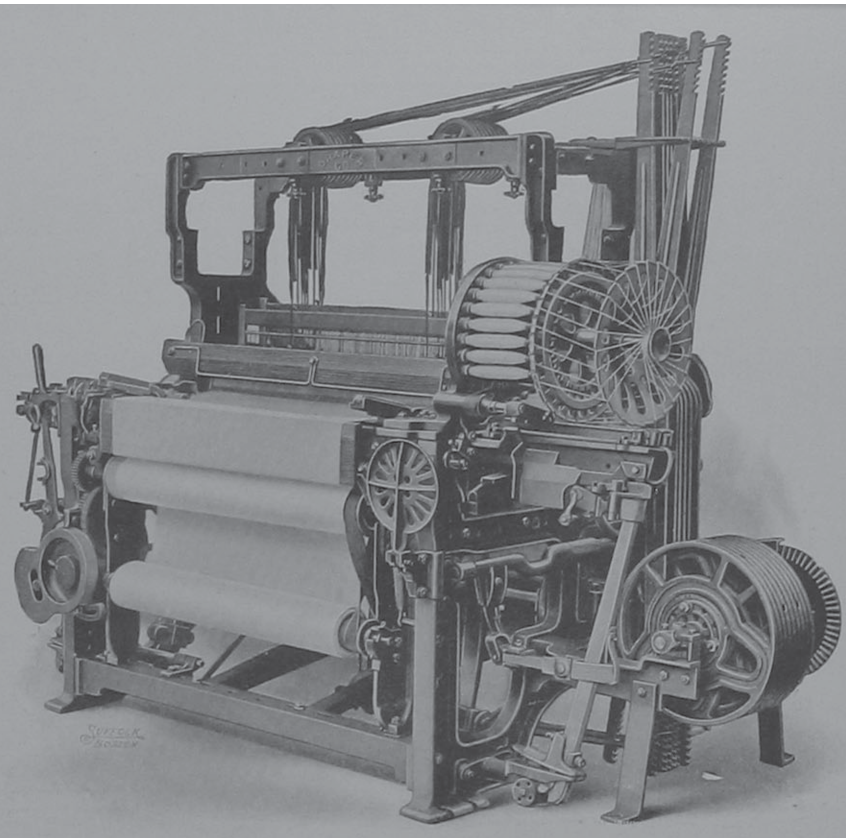

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DICTIONARY OF WEAVES

(The Most Important Addition to Textile Literature Published.)

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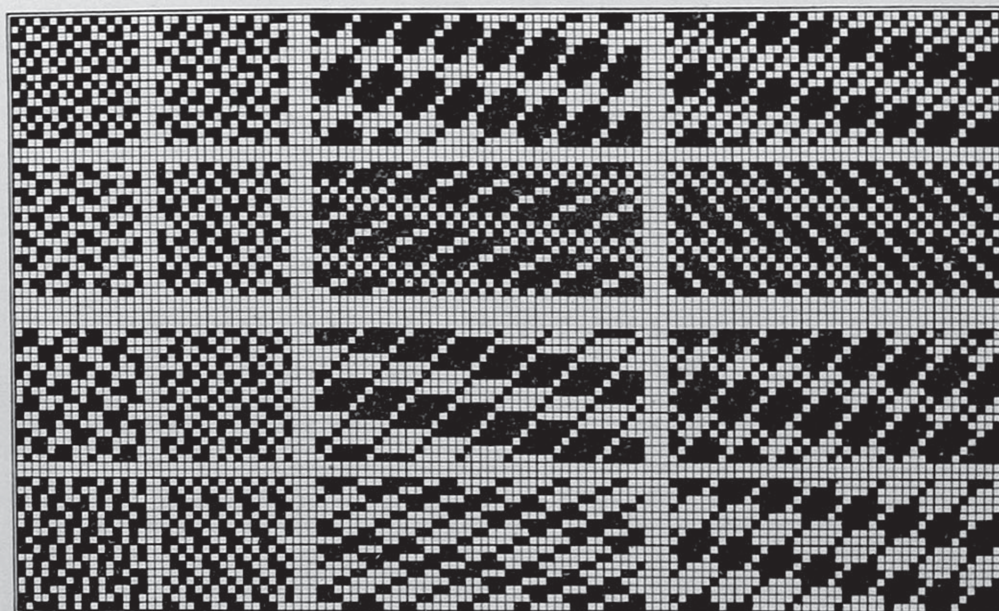

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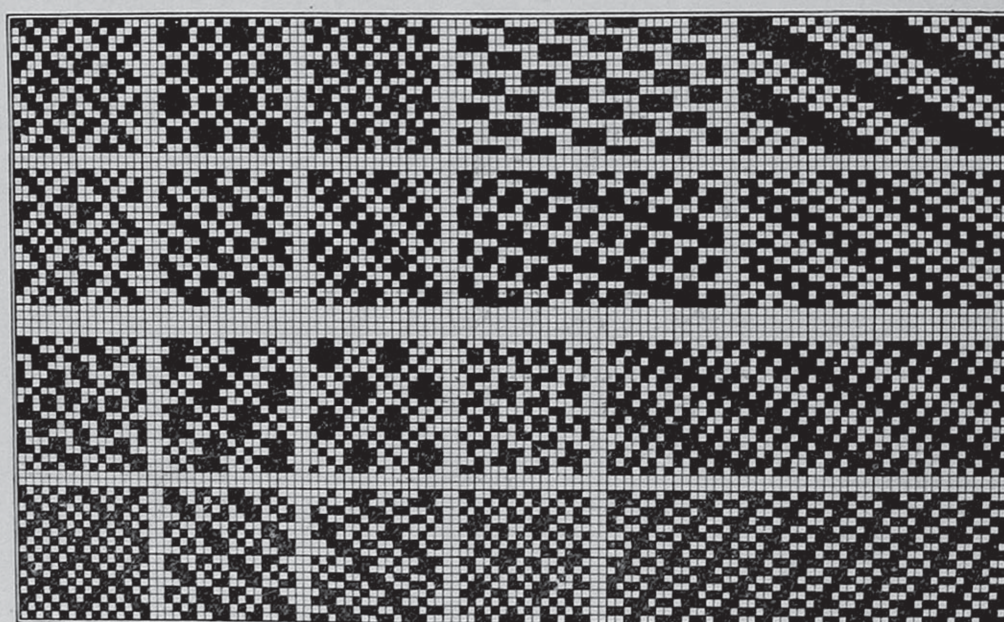
EIGHT HARNESS



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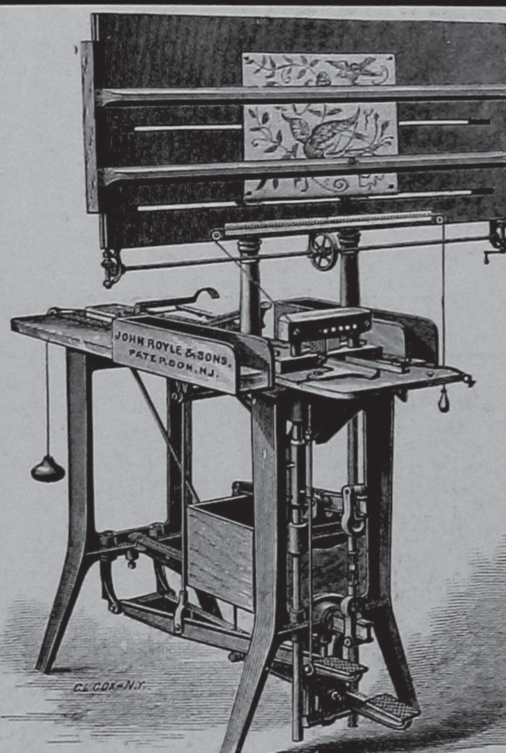

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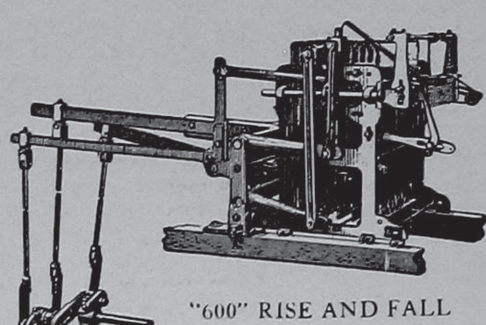

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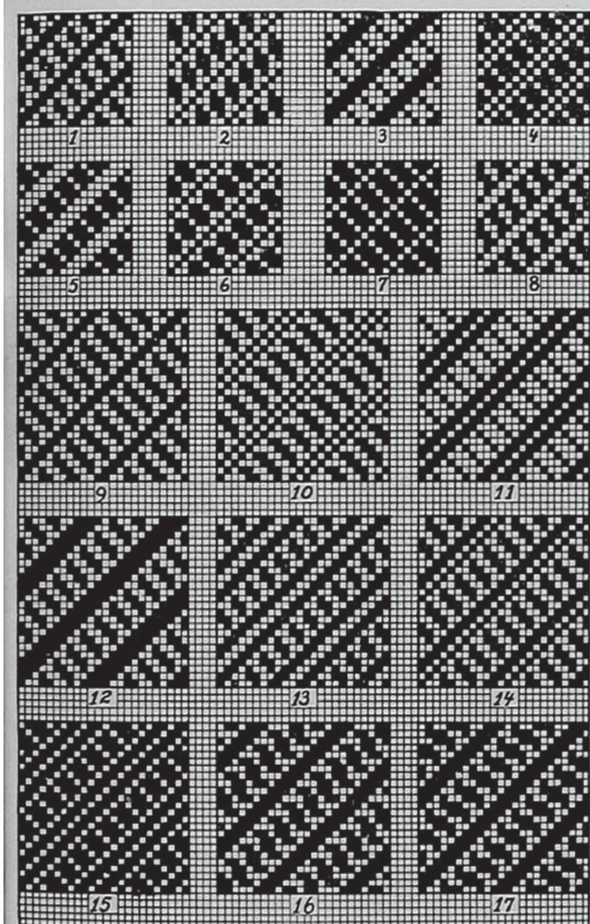
Vol. VII. October, 1910. No. 4.

DESIGNING AND FABRIC STRUCTURE.

FANCY TWILLS.

(A) **Twills Showing Double Twill Effects.**

These twills are used extensively in the manufacture of Cotton, Woolen and Silk Dress Goods, Fancy Worsted as well as Woolen Suitings, etc.



For constructing these twills, paint two repeats each way of your main twill in one direction, generally run this twill from left to right, after which insert pieces of twill running in the opposite direction between said main twill lines, previously constructed. Either warp or filling effect may be used for these main twill lines, as running from left to right, the same also referring to the reverse twill pieces.

An explanation of the accompanying two plates of weaves will readily explain the construction of these weaves.

Weave Fig. 1 shows us a 2-up warp twill effect used as foundation twill, running from left to right, said twill effect being repeated every 8 warp threads and 8 picks. For the twill effect running in the reverse direction, pieces of the same foundation twill are used; repeat of weave 8 by 8.

Weave Fig. 2 shows for its main twill a 1-up warp effect twill, repeated every 8 warp threads and 8 picks. 3-up warp twill effect pieces are used for the reverse twill effect; repeat of weave 8 by 8.

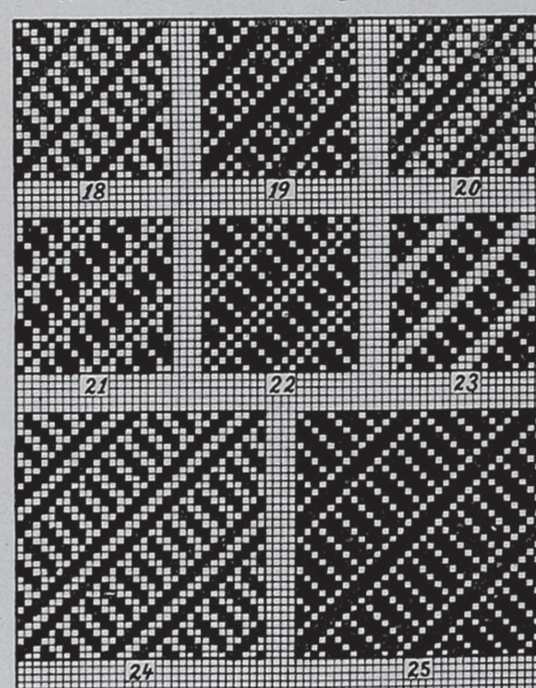
Weave Fig. 3 shows a 3-up warp twill effect for the main twill, repeated every 8 warp threads and 8 picks. The $\frac{1}{3}$ filling effect twill is used for the reverse twill effect; repeat of weave 8 by 8.

Weave Fig. 4 shows a modification of weave Fig. 2, and will explain itself.

Weave Fig. 5 shows the reverse of weave Fig. 3, a filling twill in this instance forming the main twill line.

Weaves Fig. 6, 7 and 8 show three more of these fancy twills, constructed with double twill effects; repeat of weave 8 warp threads and 8 picks.

Weaves Fig. 9, 10, 11, 12, 13, 14, 15, 16 and 17 are a collection of nine of these fancy twills, repeating on 12 warp threads and 12 picks. In this instance, as shown in connection with weaves Fig. 10, 11, 13, 14 and 15, on account of the larger number of warp



threads and picks in one repeat of the weave at our disposal, we have been able to show double twill lines for the main twill effect, using in connection with weave Fig. 10 $\frac{1}{1}\frac{1}{}$; Fig. 11 $\frac{2}{1}\frac{2}{}$; Fig. 13 $\frac{2}{2}\frac{2}{}$; Fig.

14 $^{1}{}_{1}{}^{2}$; and Fig. 15 $^{2}{}_{1}{}^{2}$ warp effect, for said main twill lines.

Weaves Fig. 18, 19, 20, 21, 22 and 23 present a collection of six of these fancy twills, repeating on 10 warp threads and 10 picks, showing single as well as double twill lines for the main twill effect. Warp effects are used for said twill lines in connection with the first five weaves, Fig. 23 showing a filling effect for said main twill line.

Weaves Fig. 24 and 25 show two specimens of these fancy twills, repeating on 16 warp thread and 16 picks. Weave Fig. 24 shows a double twill line for the main twill effect, *i. e.*, $^{2}{}_{2}{}^{2}$, whereas weave Fig. 25 shows a single twill line for the main twill effect, *i. e.*, 3-up.

It will be readily understood by the reader that these two plates of fancy twills will furnish endless ideas for the designing of new weaves.

THE JACQUARD MACHINE.

The Jacquard Harness.

(*Continued from page 63*)

DIVISIONS OF THE COMBERBOARD.

Under this heading we classify one repeat of the arrangement of threading harness cords in the comberboard, and therefore one repeat of the design of the fabric. We find fabrics in which are used one or more divisions of one system of threading harness cords in the comberboard, again there are others in which one or more divisions of one system are combined with one or more divisions of another, or even of two or three other systems.

A NEW COMPOSITION FOR COMBERBOARDS.

Comberboards, as previously referred to, are made of wood. One of the chief troubles in connection with these comberboards is the fact that the constant moving up and down of the harness cords, when weaving, is apt to, and in fact in time does wear grooves in the holes. Again, the harness cords, passing at an angle from their neck cords to the holes of the comberboard, will wear the harness cords in their passage through the holes, more particularly such of the cords as operate the side portions of the fabric, and where the direction of travel of these cords is more oblique.

To reduce the friction of the cords to a minimum, as well as to remove any chance of grooving the holes in the comberboard, is the object of a new comberboard thus to be described.

These new comberboards are produced by cutting from a block of talc or soapstone, a slab of the desired dimensions of the comberboard wanted. The slab is then provided, by boring, with the requisite number of holes for the passage of the harness cords, the perforations being chamfered at their ingress ends to simplify threading. The burs are removed and the surfaces smoothened by sand papering or polishing and then the slab is burned in a kiln to impart the necessary hardness. Subjecting the slab to 1800 to 2500° F., for one and one half to two hours will give satisfactory results.

It is claimed that this comberboard possesses marked advantages over the wooden boards used, being of great strength and durability and will not crack or warp in use. Furthermore, it is claimed, the board is of such hardness that its holes will never become grooved by the harness cords.

Harness Building.

This is a profession requiring skill and experience. Before planning the building of a harness, full details must be furnished by the manufacturer or the party who is responsible for the selling of the goods wanted, since when a Jacquard harness is once tied up by giving wrong directions, it is an expensive job to correct this, for the fact that in nine out of ten cases it means cutting down the harness and re-tying a new harness, the one cut down being a total loss to the mill, with reference to material and labor.

Provided a harness is tied up for too high a texture, under reasonable circumstances, it may be used for a somewhat lower texture, but which means loss all around, inconvenience to the weaver, a reduced capacity of chance for the designer to bring out details of effects in his work, etc. If, however, the mistake made is too pronounced, the harness is valueless and must be cut down. This explains that in connection with Jacquard work, the manufacturer must know the class of goods he is to make, *i. e.*, if there is a demand for them before he can order looms, Jacquard machines, Jacquard harnesses, etc.; whereas in connection with harness work, previous to engaging in manufacturing, he may order looms, harnesses, etc., since in this case any variety of change in texture of fabrics to be made is permissible without loss to the mill.

NECK CORDS.

This, as mentioned before, is the cord connecting hook and leash. The same is made in several ways, Figs. 23, 24, 25 and 26 illustrating two popular styles, as practised by the Crompton and Knowles Loom Works in their plan of harness building.

Fig. 23 shows the formation of hitch and knot, shown completed in Fig. 24.

Fig. 25 shows the formation of hitch and knot, shown completed in Fig. 26.

Such of the harness cords as are connected to one neck cord, are collectively known as its tail cords or its leash. After ascertaining how many harness cords are required to make one leash, the same are either sewed in one bunch with a needle and thread, as shown in Figs. 23 and 24 respectively, or tied with a knot, as illustrated in connection with Figs. 25 and 26.

In either case, care is required on the part of the operator, but more so when sewing the leash, since then it is important that the needle passes through the center of each individual harness cord, and this a sufficient number of times to insure strength at that point, and not weaken the individual harness cords by separating, at the sewing operation, the fibres composing these twine threads.

When tying a knot in the leash, as shown in connection with Figs. 25 and 26, be careful that you draw all cords equally tight, *i. e.,* have no loose loops formed above the knot by individual cords.

In some cases, the connection of leash and neck cord is made by what is known as *collets.* Figs. 27 and 28 illustrate the subject with a procedure as practised by the harness building department of the Crompton & Knowles Loom Works. The first illustration quoted shows the procedure more in detail, the latter shows the completed affair. The connection is formed by making a loop of single thread, twisting, doubling and twisting, and again doubling and twisting. This procedure results in a cord, which leaves a loop at either end of the cord, which are drawn through each other, and one of the hooks of the collet *C* is inserted, the other hook receiving the leash.

This method of connecting leash and neck cord, *i. e.,* connecting the Jacquard harness to its machine, has the advantage that the Jacquard harness, when not needed, can be removed from the loom and stored until required to be used again, the loom in the meantime having another build of a Jacquard harness attached, with a similar connection of leash and neck cord.

Cutting the Harness Cords.

Measure proper length of cords required, cut the twine into these lengths and sew or knot, as before explained, the proper number of cords into leashes, being guided for this by the number of divisions for which the harness is to be tied up. Provided the affair, for example, refers to a straight through, single cloth tie-up, with solid sections used, then a uniform number of harness cords are used in each leash throughout the entire width of the tie-up. Again the case may come up that a fraction of a division is necessary to produce the required width of a certain fabric, and when then some leashes will contain one more harness cord than others. This affair will be thoroughly explained later on when dealing with the various methods of tying up Jacquard harnesses in vogue.

Threading the Harness into its Comberboard.

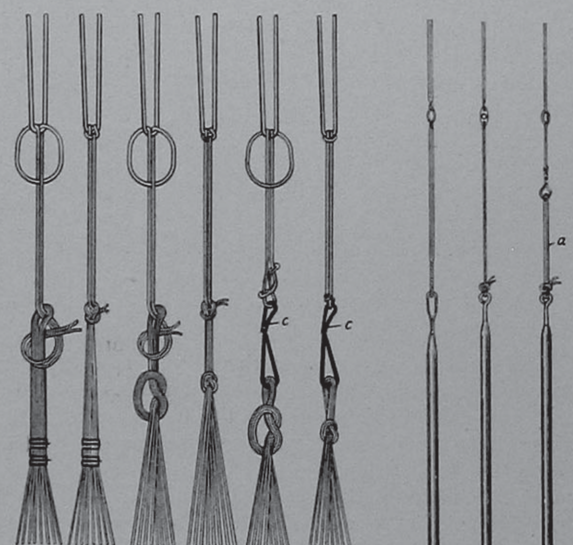
Having cut the harness, the next thing to be done is to thread its individual harness cords through the holes of the comberboard. For this work, place your comberboard in a suitable frame, have your leashes strung upon a rod, and place the latter in a suitable position above yourself and back of the board, in the frame. Next, take your first leash (let us consider, for example, a straight through tie-up, uniform divisions) and place each of its cords into the first hole of every division of the comberboard. Continue this with the next leash on your rod, threading into number 2 hole of every division. Continue in this way until all the leashes are used up and in turn all holes in the comberboard filled. After this, connect the various leashes—in rotation—with their proper neck cords, by one or the other arrangement of connection previously referred to.

Adding Heddles and Lingoes.

After the Jacquard harness is threaded through its comberboard and attached to the machine, the heddles and lingoes must be attached.

Two kinds of heddles are used, *viz,* the wire and the twine heddle; different styles of lingoes are used. Figs. 29, 30 and 31 are given to illustrate the subject, and of which Fig. 29 is a wire heddle, Fig. 30 a twine heddle and Fig. 31 a wire heddle with a twine attachment at its bottom.

In connection with wire heddles, the selection of a lingo shown in Fig. 29 is advised on account of the spring head connection of the lingo, which provides a quick, convenient and serviceable connection. Wire heddles are the ones to use for worsted work, since a hard twisted worsted warp will soon wear out or cut a twine heddle.



23 24 25 26 27 28 29 30 31

Fig. 30 is a patent Crompton & Knowles lingo for use in connection with twine heddles. The strong point for this lingo is its perfectly round eye, both inside and outside, hence no chafing to its twine heddle, at its connection, is possible.

Fig 31 shows the connection of a wire heddle to a round eye lingo, by means of twine extension *a.*

The Leasing of the Harness.

This requires a clear conception of the rotation in which the different heddles are threaded, according to the tie-up employed. Two methods are in use:

1 st. The heddle nearest the weaver in the row to be leased is the first to be threaded, and the last heddle of the same row, is the last to be threaded.

2 nd. This principle reversed, thus arranging the leasing from rear to front. The latter method is the one most generally observed.

Every row in depth of comberboard is leased separately, and in rotation secured to two lease twines, thus forming an uninterrupted line of heddles through the entire Jacquard harness. Through these heddles, the warp is afterwards drawn in rotation.

(To be continued.)

PREPARATORY TREATMENT AND WEIGHTING OF SILK.

Dr. Louis J. Matos, Textile Chemist.

The first and most important operation to which silk is subjected is that intended to remove either entirely or partially the natural gum which forms a part of the raw silk filaments. Silk, from the cocoon, as it is found in commerce, contains a varying amount of so-called silk-gum, and which varies with the kind of silk, as shown by the following table, based upon tests made at the Crefeld Conditioning House.

Country of Origin.	*Average.*
Lombardy—white	21.38
" —yellow	23.6
Piedmont—white	23.23
Bengal—white	25.06
China—white	22.1
" —yellow	28.33
Canton—white	25.7
Japan—white	19.37
Grège	23.51
French—white	25.73
Syrian	26.24
Schappe	4.54

The process of removing the silk-gum or *bast* is broadly termed *boiling-off,* but as a matter of fact, this term should apply only to the treatment of silk where it is the desire to remove more or less completely the total amount of gum on a given lot, and hence a lot so treated would be called *boiled-off*. On the other hand, silk which has been only partially degummed or discharged, that is, where the loss amounts to from 6 to 8 per cent, the silk is said to be *soupled* or a souple silk. When the loss of gum is only slight, perhaps varying from 1 to 5 per cent, the silk is termed *écru.*

The process of removing the silk-gum is technically divided into two principal operations, *stripping* and *boiling-off*. During the former, the greater portion of the gum is removed together with some of the natural coloring matter, if the silk was originally yellow, while during the latter operation the remaining traces of gum are removed and the fibre left free and clear, ready for either weighting or dyeing.

Technically, the degumming is such an operation that unless it is carried out with due regard to the nature of the silk fibre, permanent injury may result, which cannot be overcome by any subsequent process of dyeing or finishing. The silk is prepared for degumming by loosening the skeins, and hanging them from bamboo sticks in open copper kettles. The bath is prepared by dissolving from 30 to 35 pounds of soap (per 100 lbs. of silk) in sufficient water to work the silk in conveniently. The temperature is brought to as near 205° *F.* as possible, and turning the skeins slowly and regularly at first, and afterwards at regular intervals for 1 to 1½ hour. During the immersion of the silk in the hot soap solution, the fibres will be noticed to swell considerably and be very sticky to the touch, but in the course of a few minutes the gum will be found to gradually dissolve, leaving the fibre quite glossy.

Too much attention cannot be given to the turning of the silk on the rods, every part should have the same time of immersion in the bath. Should the turning be irregular, *the silk will not take the color evenly from the dye bath,* and may lead to very unpleasant results when the woven fabric reaches the finishing room. During the dyeing of skein silks it is observed from time to time that uneven patches are the result, and which frequently is attributed to the dyestuff going on unevenly; but if the affected skeins are carefully examined, the uneven patches will in most instances show the presence of remaining traces of silk-gum.

Another source of trouble in degumming of silk is the presence of noticeable traces of lime or magnesia in the water used. It is impossible to degum silk successfully in hard water, and further, it is out of the question to make any addition of *chemicals* to the soap bath to neutralize the presence of lime or magnesia. The only proper course to follow is to use pure or purified water, and thus obviate the injurious presence of lime, etc.* The presence of lime (and magnesia) causes the formation of lime-soap in the bath, and which, as soon as formed, rises to the surface of the bath and attaches itself to the silk fibres, and cannot be removed by any practical means although a solvent is much desired.

In order to ensure the removal of the last traces of gum the silk is lifted from the *stripping* bath and immersed in a fresh bath, charged with 15 pounds of soap and kept immersed for from 1 to 3 hours, experience alone indicating when it is safe to lift a given lot of silk and wash it. This second soap bath—the actual *boiling-off* bath is fortified with 15 to 20 pounds of soap and then serves as the *stripping* bath for the next lot of silk, while a spent stripping bath is valuable as an assistant in the dye house for dyeing colors.

The soap used for handling silk should be of the best quality, thoroughly saponified, and without any free alkali. As silk takes up odors very readily, the choice of a soap should be made with caution, and cheapness must not stand in the way of true economy. The best possible soap for silk stripping is without doubt, made from olive oil, and the preference should always be given to it. There are on the market a few proprietary brands of soap having special merits, but as a rule the silk dyer is always safe with a well made olive oil product.

The production of souple silk differs slightly from that described before for *boiled-off*. The general French process, of which that much used in Lyons is the most important modification, is, with permissible variations, as follows: The sericin or silk-gum is only partially removed (6 to 8%) by immersing the skeins in a soap bath, prepared with 10 lbs. of soap (per 100 lbs. of silk) and heating to 95° *F.* for 2 hours, turning during the entire time with great care. Afterwards, the skeins are passed through a double change of wash water, or, as is done in some mills, washed automatically on the machine, and then immersed for 15 minutes in a weak *aqua regia* bath standing at 2½° *B.* The silk is kept immersed until it assumes a greenish tint, when it is thoroughly washed and then hung for several hours in the sulphur chamber until the proper degree of whiteness is obtained. The *soupling* of the silk is done by passing the skeins through a bath containing ½ ounce of tartar per gallon, working for 1½ hours, and then washing in warm water. Of course, silks that are to be soupled for black are not bleached.

In later years, the bleaching has been done by means of hydrogen peroxide, or indirectly with sodium peroxide. By the adoption of this process the disagreeable sulphur house is avoided.

Ecru silk is obtained by treating the silk in a very weak soap bath, which effects a removal of only a small proportion of the silk gum (rarely exceeding 4 per cent) consisting chiefly of fats and waxy bodies.

As silk is prized on account of its great strength, fineness, and lustre, each operation must be given careful attention so that none of these properties should be impaired; the use of good, pure water must always be the first consideration, and if the source of water for a silk mill is of doubtful purity, it should be corrected by the installation of a proper purifying plant.*

As the ultimate lustre of finished silk depends upon the successful completion of each operation before commencing the next, it becomes necessary to use liberal quantities of water for the various washings, indeed, the best results are always obtained in mills where ample time and ample water are both given.

Where silk is to be weighted before it is immersed in the dynamite liquors, it should be washed free from every trace of soap, and the utter impossibility of doing this, will be apparent at once if the water used for washing contains lime. Even should the water be pure and free from lime or magnesia, but traces of soap be allowed to remain in the silk on account of defective or hurried washing, and this silk afterwards subjected to the usual tin weighting process, or *pure dyed* with acid colors in the ordinary way, the presence of this soap will cause the formation, or rather liberation, of free fatty acids which will at once adhere to the silk, and cause uneven threads or even spots to show throughout the finished fabric. Pure water and thorough washing or rinsing is absolutely indispensable for good results when handling silk.

(*To be continued.*)

A New Process for Preserving Tin-Weighted Silk.

Tin-weighted silks are deleteriously affected by weighting, with the result that sooner or later (sometimes in the course of only a few months after they have been prepared for the market), depending upon the quality of the silk and the strength and character of the weighting solution, the elesticity of their fibres depreciates, they becoming inert and non-resistant, while unsightly discoloration, in the form of red spots, develops in the goods.

These defects are known to be due to the corroding influence of the chlorids in the weighting solutions, and it has heretofore not been possible substantially perfectly to insure against their appearance in the silk, at least without causing other conditions to arise which would undesirably affect the quality or appearance of the goods.

To suitably counteract this corrosive influence of the chlorids, treat the previously weighted silk with a solution containing a compound of the hydroxylamin type, as follows:

First prepare a one-half per cent water solution of hydroxylamin hydrochlorid with which impregnate the weighted and dyed silk, passing it through the solution at a temperature of about 60 deg. *F.*, whereupon it is dried. This treatment increases the life of the tin-weighted silk materially over what it would be without such treatment, the fibres retaining their natural elasticity and resistance and the development of discoloration is prevented. Moreover, it has the further advantage of permanently establishing the original color-effect of the goods, the dye being made more fast than it would otherwise be. Berg-Imhoff.

AFRICAN SILK.

By H. Zeising, Textile Engineer.

Besides the Bombyx mori, true or cultivated silk spinner, there are any number of species of wild silk spinners met with in Eastern Asia and India, oftentimes collectively classified as Tussah spinners, the product of which, since 1860, has gradually more and more come to our notice; at present, Tussah silk is a most important item in the textile industry.

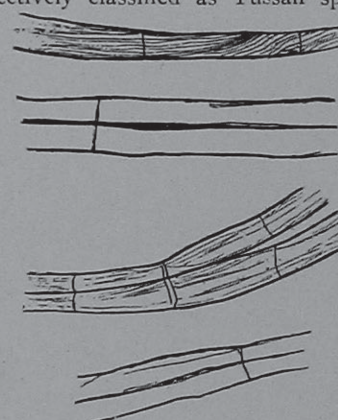


Fig. 1.
Cocoon Threads of Anaphesilk, 230 Times Enlarged.

A few years ago there was discovered in Africa a worm which also produced a silk like fibre.

Contrary to the habits of the wild silk worms of Asia, that of Africa is a family spinner; by that is understood that hundreds of worms prepare one nest, in which in turn they then change into their chrysalis or pupa stage. Little attention has been thus far paid to this worm from a zoological point of view, they being, according to Professor Vosseler Amani, classified under the name of *Anaphe*. From 9 to 10 months is the time required for their development. They feed chiefly on the Bridelia micrantha, although they also thrive on other African plants, and are found

*We call the readers attention to the article on "*Water Filtration*" by C. Hungerford in this month issue.

all over central Africa from 15° north to 25° south, being in many instances met with in such quantities that they actually become a plague for the natives, the latter being in turn compelled to destroy them in quantities by burning down the plants on which they feed.

Their nests vary in shape and dimensions, between 15 to 40 *cm* long, respectively wide, and from 8 to 15 *cm* thick. To secure them in position, they are spun by the worm between branches, which in turn in many cases adhere to the nest after the harvest.

In these nests several layers can be readily distinguished. The outer one consists of a loosely intermixed, thickness of fibres, of about 1 *cm* in thickness. After this come a 1 *mm* thick, hard, parchment like, dark brown colored skin. Examining the latter more closely reveals the same to consist of a great number of solidly cemented thinner layers. This skin protects the nest against the influences of the weather, as well as enemies. This protector would prevent the moths from liberating themself, but for the fact that the worms, in their transformation into their pupa state, leave openings in forming the nest; said openings being protected toward the outside by tube like extensions and closed at their inner side by means of loose fibres. In its interior this protector is filled out with a soft mess of fibres, in which in turn the worms (from 100 to 300) embed their respective cocoons. The latter are of a thinly lined construction, loosely formed, about 40 *mm* long and in their centre about 8 *mm* thick, both ends being pointed. The average weight of a complete nest amounts to about 50 *gr*.

Illustrations Figs. 1, 2 and 3 show *Anaphesilk* as a fibre of peculiar construction. Its section, Fig. 3, resembles that of Tussah and Oaksilk, the same being considerably wider in one direction than in the other, not of a regular oval shape but of a rather irregular, triangular or quadrangular shape, with pronounced rounded ends. In illustrations Figs. 1 and 2, the fibres are seen part the time from their wide, and part the time from their narrow side, showing a twist at these changes, closely resembling those of other fibres, like for instance cotton.

At a distance of about 0.1 *mm*, Anaphesilk shows most peculiar rings around the fibre, and in which a displacement of the inner structure must take place, by means of which the light striking it must be thrown back to a greater extent, as a thickening or cross displacement does not take place. In the cocoon-thread these bright rings show on both filaments, *i. e.*, brins at the same place, suggesting that the worm while at work spinning the cocoon must at certain intervals twitch.

The fibres show lengthways more or less pronounced streaks, some showing broken up effects, beginning in the centre of sections as formed by the bright rings, after which they increase in size, ending with the next bright ring.

A superior characteristic of Anaphesilk compared to Tussah or Oaksilk is its fineness of count. The cocoon thread shows a thickness varying from 32 to 40 *mmm* in one direction to from 20 to 28 *mmm* in the other direction. For the brins, the dimensions average from 22 to 26 *mmm* in one direction, from 9 to 12 *mmm* for its other direction, thus showing that the section of the brins is about 2½ times as wide in one direction compared to that of the other direction.

The color of Anaphesilk is dark brown, not only its gum but also the fibroin. Possibly the latter is colorless and that only the streaks previously referred to carry the coloring matter.

The mass, cementing the fibres in the nest, appears under the microscope as a yellow granular substance.

Lustre is hardly noticeable on the raw fibre, but appears after the boiling-off, and can be increased by suitable handling at the dyeing process, but does not approach the lustre characteristic to true silk; at the same time, no matter how much said lustre may be improved at the dyeing process, the same will always be a characteristic of a metallic appearance, on account of the flat construction of the brins. In the same way, does Anaphesilk differ from true silk, with reference to the touch of the hand, presenting a somewhat soft, wool like feel.

If handling both silks as to weight in your hands, Anaphe will feel lighter. Tests have given the specific weight of Anaphesilk as 1.282 while that of true silk by the same process has been 1.36.

This shows that a thread made from Anaphe must be thicker in its diameter compared to a true silk thread of a corresponding count. Since by previously given dimensions regarding the diameter of the fibres it has been shown that the same is slightly larger than that of true silk, it will thus be seen that the filling power of Anapheschappe must be superior to that of silkschappe, *i. e.,* our spun silk. This feature has been practically demonstrated in connection with velvet fabrics and where Anaphepile produces the best cover.

With reference to strength, a yarn measured in a Schopperschen Dry Conditioning Apparatus as 222/2 (refers to the german metric measure) and which with the permissible moisture to silk, of 11°, equalled 200/2, showed a strength of 211.75 *gr*, and an elasticity of 7.755%. The measurements were taken at 25° C and under 45% relative air moisture. This yarn was in turn placed for several hours in water, in order to most thoroughly saturate it, after which it then showed a strength of 128.5 *g*, or about 60% of that of the dry thread; the elasticity at the same time was raised to 10.1%, *i. e.*, about one third. After drying the yarn and testing it again, its strength was raised again to 212.5 *g*, or about to the same strength it had, previously to wetting; its elasticity however dropped to 6.65%, *i. e.*, to about ⅞th of that it possessed originally.

With reference to its chemical composition, Anaphesilk differs considerably from that of Tussah.

Subjecting Anaphesilk, for one hour to the influence of cold muriatic acid, of 16° *B* strength, will reduce its breaking strain about 12%, showing also a loss in weight of 5.6%; a weak bleaching process at the same time takes place. Boiling muriatic acid will dissolve Anaphesilk, after 3 minutes, into a brown liquid.

Sulphuric acid of 60° *B*, cold, changes Anaphesilk after one minute into a brown, gelatinous mass, which is slowly dissolved when adding water.

Subjecting Anaphesilk for three days to the influence of acetic acid, will not impair its strength, the silk however losing about 6.7% in its weight, the procedure at the same time resulting in a slight bleaching. Boiling Anaphesilk for 6 minutes in chromic acid of half strength, made the same rotten.

Boiling Anaphesilk for 10 minutes in oxalic acid of full strength, made it lose 27% in its strength.

Soaking a skein of Anaphesilk for one day in muriate aluminum sesquioxide of 5½° *B*, and drying it at a temperature of 135° *C*, made it lose all its strength, showing that a carbonizing by this chemical is not possible. However it may be of interest to note that the procedure resulted in an excellent bleach.

A sodalye of a strength of 20° *B*, cold, after acting for one hour on Anaphesilk showed a loss in weight of 5.6% in the latter, as well as a loss in its strength of 9%; boiling the lye for 5 minutes dissolved the silk into a brown liquor. Using a sodalye of a strength of 37° *B*, after one hour showed a loss in weight of 8%, and a loss in strength of 10%.

Potashlye of a strength of 45° *B*, cold, after 15 minutes showed a gain of 2% in the strength of Anaphesilk, no loss in weight being noticed. The lustre increased, also the elasticity of the fibre. Subjecting the fibre for one day to said lye, showed a gain in its weight of 12%, its lustre was at the same time still further increased, but the strength of the fibre was reduced by 27%, also was its elasticity considerably reduced. Potashlye of a strength of 25° *B*, after one day, produced a loss in the strength of the silk of 66%, its loss in weight being 11%, resulting at the same time in a lighter color as well as a higher lustre to the fibre. Boiling the lye for 3 minutes dissolved the silk into a brown liquor.

Tests as to bleaching with sodium perborate gave good results. Strength and elasticity did not change, neither the weight of the Anaphesilk. Adding vinegar to the perborate reduced the action of the bleach by one half, resulting at the same time in a loss in strength of 6% and a loss in weight of 8½%.

Cupric oxide ammonia does not dissolve Anaphesilk, the latter being by it colored a faint blue, showing at the same time a weighting of 12%. Strength and elasticity are not influenced by it.

Nickel oxide ammonia showed no influence as to strength, elasticity and weight, the same remaining identical.

Besides these theoretical tests as to nature and behavior of this new textile fibre, the textile school of Crefeld, the most prominent silk textile school in the world, was ordered to make practical tests with reference to the spinning of Anaphesilk. The greatest trouble encountered was the opening of the nests, for the reason that the chemicals necessary to be used to dissolve the glue, at the same time attacked the fibre. After some experiments the trouble was solved, with the report that improvements in the process are to follow. The successively following processes, in turn, were such as practised in common with spun silk. The experience up to the combing process, however, was not the most pleasant to the operators. The worm is closely covered with fine hairs, which, with its last skin, remain in the nest, and as will be readily

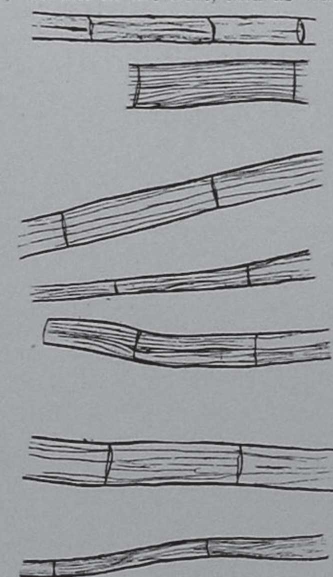


Fig. 2.
Brins, or Single Filaments of Anaphesilk, 230 Times Enlarged.

understood are liberated as dust during the first processes in the mill, depositing themself upon the skin of the operator, thus the cause of itching to him.

On account of the fineness of the fibre, Anapheschappe can be spun into very high counts, in fact will permit spinning it in counts twice as high as regular Tussahschappe can be spun. On the loom, the use of Anapheschappe results in production, as well as quality of fabric structure, the latter more particular when referring to velvets. Compared to Tussahschappe, the new textile fibre has the disad-

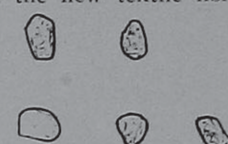


Fig. 3.
Sections of Brins of Anaphesilk, 230 Times Enlarged.

vantage in that it is only suitable for use in connection with dark shades, since bleaching it is too expensive, besides a perfectly white thread is impossible to be produced. Again its lustre is lower than that of raw or wild silkschappe, possessing also a slight metallic lustre, not suitable for every class of fabric.

A point in favor of Anaphesilk is its low price, compared to regular schappe yarns of equal quality and count; the former being about 40% less. The use of Anaphesilk is at present strongly pushed by the German Government among German mills, trusting that in the near future Anaphesilk will become a most important export article for its East African Colonies.

RIBBONS, TRIMMINGS, EDGINGS, ETC.

(*Continued from page 41.*)

Ribbons Showing Raised Loops.

Arranged After a Given Design.

Fig. 157 shows us a sketch of such a ribbon; the ground of it interlaces on taffeta; the loops, as shown by oval spots, being produced by floating the filling around wires, placed in proper position through dents of the reed.

Fig. 158 shows the weave plan for producing these fancy ribbons, the lay out referring to a single shuttle loom used. An explanation of this weave plan will readily show the reader how these loops are formed.

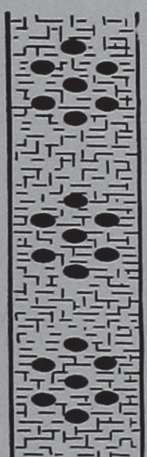


Fig.157

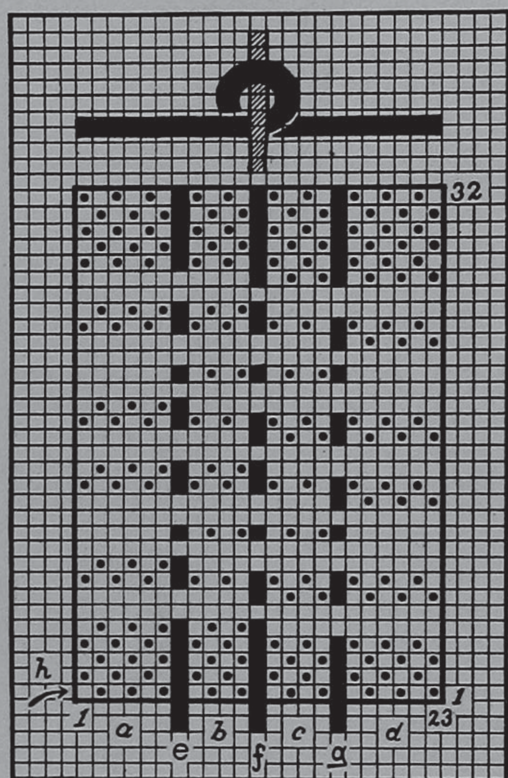


Fig. 158

Arrangement of warp:

6 warp threads (Section *a*)
1 wire
4 warp threads (Section *b*)
1 wire
4 warp threads (Section *c*)
1 wire
6 warp threads (Section *d*)
23 ends shown in our weave plan.

Dot type shows the warp threads interlacing with the filling on taffeta.

Full type shows the raising and lowering of the three wires *e*, *f* and *g*.

Repeat of Filling pattern shows 32 picks.

The filling to enter pick 1 from the left, see arrow *h*.

Picks 1, 2, 3 and 4 interlace with taffeta for all warp threads; all three wires are up on these picks.

Pick 5. Filling enters again from the left. Warp section *a* and *b* interlace on taffeta; wires *e* and *f* are raised.

Pick 6. Filling enters from the right, no warp threads or wires being raised, the shuttle draws the filling along, the same being hitched by and around wire *f* to the fabric.

Pick 7. Filling enters from left; warp sections *a* and *b* and wire *e* being down, the shuttle draws the filling along, the latter becoming hitched to the fabric structure by wire *f* being up.

This procedure completes loop *i* in fabric sketch, a diagram of the shape of loop as formed being given above the weave. Three picks are required for the formation of each loop.

The filling caught by wire *f*, after thus causing the formation of loop *i*, in turn interlaces with taffeta in connection with warp sections *c* and *d*; wire *g* is also raised so as not to interfere with the formation of the ground structure.

Pick 8 is a clear through taffeta pick, the same as picks 1, 2, 3 and 4 previously explained, *i. e.*, all four warp sections, *a*, *b*, *c* and *d*, interlace with the plain or taffeta weave; all the wires are raised.

Picks 9, 10, 11, 12 and 13 form the two loops *j* and *k* in fabric (Fig. 157) thus:

Pick 9: Warp Section *a* interlaces with taffeta, wire *e* up.

Pick 10: Everything down, the shuttle draws the filling along, the same becoming hitched by and around wire *e* to fabric.

Pick 11: Warp Sections *b* and *c* interlace on taffeta, all three wires are up. This pick is used in the formation of two loops. First, it closes loop *j* around wire *e*, and, Second, it is the first pick for the formation of the loop *k*, by means of section *d* being down.

Pick 12: All down, the shuttle draws the filling along, hitching it to and around wire *g*. The loop *k*, thus formed, is in turn secured to the fabric by

Pick 13, having sections *a*, *b* and *c* down, also wires *e* and *f*. Section *d* interlaces in taffeta, wire *g* being raised.

Pick 14 is a taffeta pick for all four sections (*a*, *b*, *c* and *d*) and equal picks 2 and 4.

Pick 15, same lift as pick 5,
" 16, " " " " 6,
" 17, " " " " 7,
" 18, " " " " 8,
" 19, " " " " 9,
" 20, " " " " 10,
" 21, " " " " 11,
" 22, " " " " 12,
" 23, " " " " 13,
" 24, " " " " 14 or 4,
" 25, " " " " 5,
" 26, " " " " 6,
" 27, " " " " 7.

Said picks in turn produce in the loom loops *l*, *m*, *n* and *o*, in the same manner as loops *i*, *j* and *k*, previously explained, were produced, hence no explanation of these picks required.

Where three picks are required to form one loop, said three picks (see picks 5, 6 and 7) produce combined one taffeta pick, for which reason the take-up of the loom must be arrested for two of these loop forming picks.

Where five picks are made to form two loops, said five picks (see picks 9, 10, 11, 12 and 13) produce combined one taffeta pick, for which reason the take up must be arrested for four of these loop forming picks.

Picks 28, 29, 30, 31 and 32 are five taffeta picks, making with picks 1 to 4, nine taffeta picks between the sets of loops.

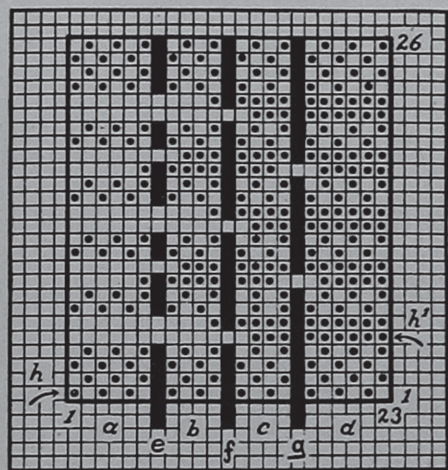


Fig. 159

Fig. 159 gives us the weave for producing fabric shown in Fig. 157, by means of two shuttles. In connection with this weave we then can use two kinds of filling yarn; for example, a fine count of yarn or color No. 1 for all clear taffeta picks, *i. e.* the ground of the fabric, using either a heavier count of yarn or color No. 2 for the loop forming picks, in turn producing either heavier loops or such of a different color compared to those produced with weave Fig. 158, and where only one kind of filling can be used. The loops may be formed with three picks, as was the case with the one shuttle plan, previously explained, or we may prefer to save a number of picks in the repeat of pattern, and when, as is shown in weave Fig. 159, every pick is used in the formation of one as well as more loops. In this instance considerable more loop yarn will rest useless on the back of the ribbon, detracting from its good appearance. To form too many loops, side by side, with one pick is not advisable to do, for then the coarse loop pick will place the finer ground picks too irregular in the fabric structure.

Type used in connection with weave Fig. 159 is selected to correspond with that used in weave Fig. 158. Arrow *h* indicates the entering of the fine count, or color No. 1, filling at the left; arrow *h'* that of entering the heavy count, or color No. 2, filling at the right hand side.

Repeat of Weave 23 by 26.

The British cotton mills bought 5,700 bales less raw cotton in August, 1910, than in the same month last year; but what they did buy, cost them $2,000,000 more.

COTTON SPINNING.

The Ring Frame.

(*Continued from page 69.*)

Ballooning and Separators.—As has been explained in the chapter on travelers, the same revolve at a very high speed, up to 10,000 *r. p. m.*, round their spinning rings. The yarn is held within a limited space by the eye of the thread guide at the top and the traveler at the bottom, the loose yarn, between these two points, being rotated by the traveler at so high a speed has to fly away from the axis around which it revolves, on account of the centrifugal force generated, in turn causing the yarn to balloon with the operation of twisting. The degree to which ballooning takes place, depends mainly upon the counts of the yarn spun, the speed of the spindles, the amount of traverse given the ring rail, and the weight of the traveler, besides to some extent, upon the atmospheric resistance to the thread. This ballooning action of the thread, if excessive and not checked, would cause the balloon of one thread to strike against the balloon of the next thread, resulting in entanglement and breakage of threads, except spindles are placed far enough apart to permit any amount of ballooning of the threads to take place, or some other means are adopted to regulate the size, *i. e.*, amount of the ballooning. To build ring frames with such a large gauge between the spindles so as to permit excessive ballooning, would mean a much longer frame for a certain number of spindles, with its consequent waste of floor space, for which reason a device, known as the separator, is adopted, and by means of it the gauge of the spindles is kept down.

Separators are usually met with on frames for spinning our coarse and medium counts of warp yarns, both on account of the character of the wind as well as the long traverse of modern frames, less frequently are they found on frames for filling yarns and high counts of warp yarns.

In the case of a warp frame, where traverse is so much longer than on filling frame, this ballooning is most apparent when the ring rail is at the bottom of the traverse, as there is a longer length of yarn between thread guide and traveler.

The thrashing of the yarn against its separators, without question, is of no help to the yarn, for which reason some spinners consider it a paying investment to give up floor space for wider gauge between spindles. Another disadvantage of separators is, that they are in the way of the spinner, catch flyings and dirt, and in turn distribute it on the bobbin, and interfere more or less with the proper examination of the bobbins on the frame, *i. e.*, seeing that they are all of the same height and in the proper place on the spindle; furthermore, if not properly mounted, they may be found an obstruction in doffing. For this reason, when separators are used they should be brushed frequently, thus removing one of the claims of their disadvantages.

Separators are stamped sheet metal blades, of different sizes, to suit the counts and character of yarn spun, and are attached to light rods, running lengthwise in the ring frame. One blade stands above the ring rail in the middle of each space, between two spindles. These rods, to which the separators are attached, are in turn connected to lifting rods, similar to those used for traversing the ring rail, but with a smaller traverse. The separator rises and falls with the ring rail, through a shorter distance, although this is not mathematically correct.

Separators devised with a view of reducing the number of parts, which are simple in action, not liable to get out of order, and more cleanly when in operation, will have the prior claim. They should be very light, so that as little weight as possible is added by their installation to the ring rail, and this addition is not made in any way that will throw the ring rail out of balance at any point in the traverse, or out of position or relative proposition, from the beginning to the end of the set.

Considering the traverse of the ring rail will show us that the centre of the balloon, as formed by the yarn, varies as the rail traverses up or down. This will be best explained in connection with an example: Suppose that when the rail is at the bottom of its traverse, the distance from the traveler to the eye of the thread guide is 11 inches, and when then the balloon, as formed by the yarn, would have its largest diameter about $6\frac{1}{2}$ inches below the thread guide. Now considering the affair with the ring rail up, the largest diameter of the balloon will correspondingly be transferred to a higher point. This will show us that in order to have a separator operate to its best advantage, it is necessary for it to move up and down with the traverse of the ring rail, so as always to present the centre of its plate as near as possible to the point where the largest diameter of the balloon is located.

When doffing, it is necessary to throw the blades of the separator back, so that they will not interfere with the process. This is generally done by having the rod carrying the separators mounted on a combination of levers, which either hold it firmly in position between the spindles when working, or, by the locking of a knuckle joint retain it firmly in position behind the spindles, when doffing.

There are several makes of separators on the market, all for accomplishing the same purpose, but differing in details of construction and operation. Frames not equipped with regular separators, are sometimes fitted up in the mills with what we might call a home made separator, *i. e.*, a wire is run the full length of the frame, just behind the bobbins and against which wire the yarn strikes, this partly checking its tendency to balloon. Such a home made affair, in connection with a medium amount of ballooning, may accomplish all the spinner is after.

The Mason Machine Works Separator is shown in Fig. 283, showing at the same time as much of a spinning frame as is necessary to present the working parts of this separator. The stand *A* bolts to the front of the roller beam under the thread board and is provided with an extension bracket. The stand or bracket *B*, which is also provided with extension slots, bolts to the foot of the bracket *A*. These extension arrangements allow of a wide range in adjustment of the separator for long or short traverse of ring rail and for large or small spinning rings. The arm *C*, pivoted on *B*, carries at its end the knuckle joint or hinge *D*. On the separator rod *F* is a corresponding hinge, which allows the entire separator blades and rods to be turned back under the thread board. The separator blade *E* is attached to the rod *F* in the usual manner. The rod *F* is supported by the auxiliary lifting rod *G*, which in turn is supported by the bracket and foot step *H*, attached to the ordinary rocker shaft.

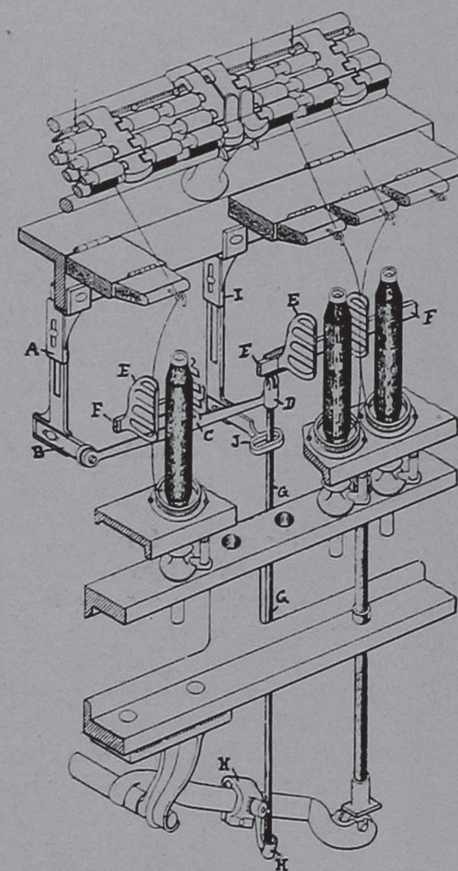


FIG. 283.

Additional brackets, *I* and *J* control the forward position of the separator blades, which are perforated to insure the light weight required, and are curved slightly in the same direction that the thread takes in the action of ballooning. At the point of largest balloon (or when the rail is at the bottom), the thread will be deflected by the curved portion, and at the same time, the next blade edge is turned away from the ballooning thread, and whipping of the threads around the blades is overcome. The operation of this separator is practically a straight lift, up and down, controlled entirely by the rocker shaft arm. The blades can be turned back entirely out of the way, and a single movement restores them to normal position. As mentioned when previously explaining the proper position of the separator blades during the process of spinning, it is particularly desirable, when the traverse is long, that the separator should travel continuously, and at such a rate of speed (slower, of course, than the ring rail), as will maintain the blade in the centre, vertically, of the balloon at all times. By the same means which render this result possible with this separator, the pressure of the separator upon the wind motion is made uniform. The extent of vertical movement of this separator can also be regulated at will, by means of adjustable connection with the lifter arm. The blades are made of stamped steel and of any size to suit the demands of the frame to which this separator is applied to.

(*To be continued.*)

DYEING COTTON CHAINS.

(*Continued from page 20*)

INDIGO DYEING MACHINE. Fig. 29 shows us an elevation of this machine as built by the Textile Finishing Machinery Co., Providence, R. I. The dye vats *A* are made up in sets of two, three, or sometimes four, with one overhead rigging for handling the warps for each set. These vats consist of cast iron plates, bolted together, and for convenience in operating they are sunk or let through the floor, so that the top is only a short distance above the floor.

The overhead rigging consists of a wooden frame *B* which straddles the vats, and rolls on a track *C*, so that it can be moved from vat to vat. This frame supports nip stands *D*, containing rubber covered squeeze rollers *E*, *F*, carrier rollers *G*, pin rail *H*, etc., and an immersion frame (shown in dotted lines) which by means of handle *I* through gears *J* and rope or chain connection *K*, can be raised from or lowered into the tanks *A*, and which supports the brass immersion rollers *L* for leading the warps *M* through the dye liquor. Chains to be dyed should be of such a length that they can be run through before it is necessary to stop the machine for any reason, as at noon or the close of the working day, since otherwise uneven dyeing will result. From three to four runs are usually given to the chains, they being dropped at the delivery end of the machine into trucks and allowed to oxidize between each run.

The warps are then dried on a warp drying machine, a specimen of which is given in connection with

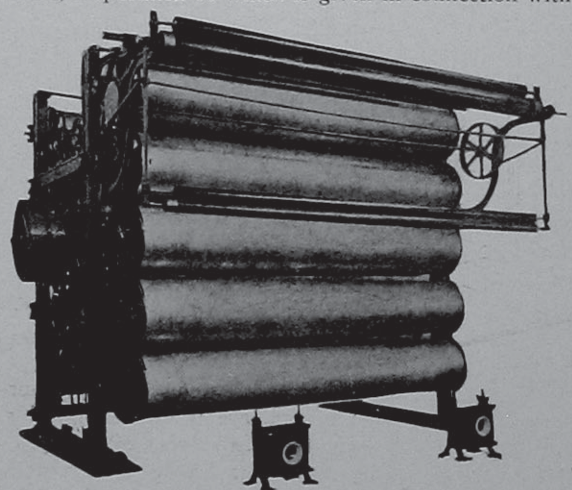


FIG. 30.

Fig. 30, showing us the Upright Warp Drying Machine as built by the Textile-Finishing Machinery Co., Providence, R. I., showing nine tinned iron cylinders placed in each column, with 2 columns to the machine, *i. e.*, eighteen cylinders being used.

After the warps are thus dried, Long Chains are in turn beamed on a Long Chain Beamer (as was shown and explained in connection with Fig. 15 in the February issue) onto back beams for the slasher (see Figs. 16 and 18, April issue) where then the sizing and drying of the yarn is done.

Short Chains, after having been sized in a Sizing Machine (see Fig. 19 and its descriptive matter in the April issue) and then dried on an Upright Drying

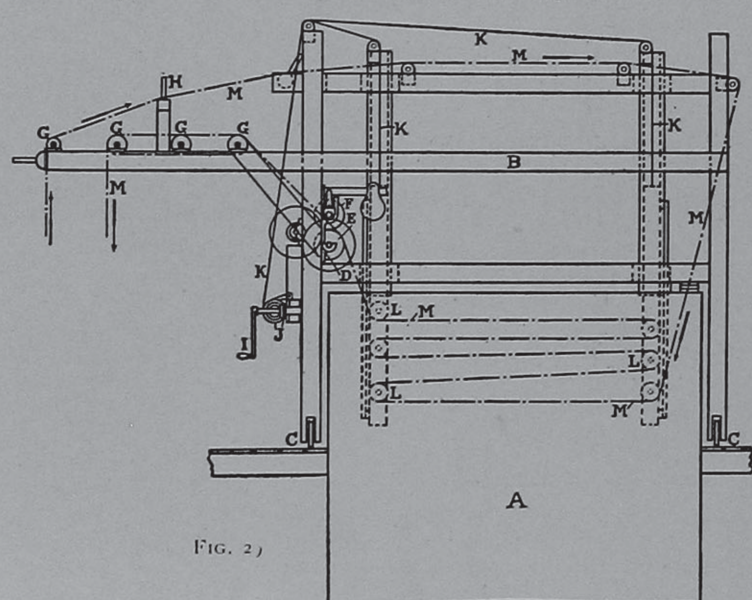


FIG. 29

Machine (see Fig. 30) are, if destined for warp purposes, in turn dressed and beamed on a Short Chain Dressing Machine, a specimen of which is shown in Fig. 31 in its perspective view.

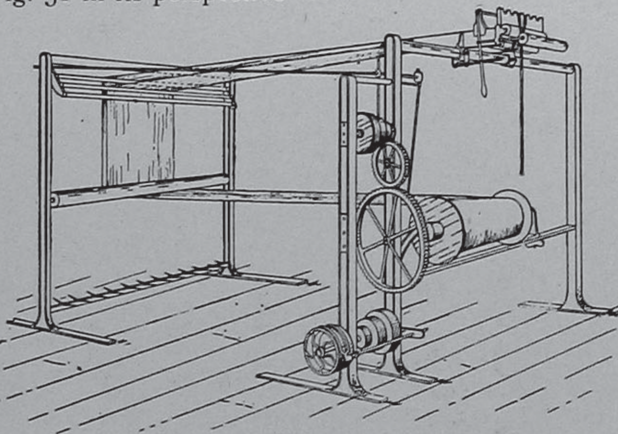


FIG. 31.

Such of the Chains as are destined for filling purposes, whether sized or not, are wound on bobbins, *i. e.*, prepared for the shuttle of the loom, on the Quilling Machine (see Figs. 20, 21 and 22).

(To be continued.)

NOVELTIES FROM ABROAD.

Fancy Dressgood. (Diamond Pattern.)

Warp: 1575 ends, 1/12's white cheviot, bleached.
Weave: See **Fig. 1**; repeat 24 warp threads and 24 picks; 24-harness straight draw.
Reed: 8¾ @ 3 ends per dent; 26¼ ends per inch; 60 inches wide in reed.
Filling: 26 picks per inch, 1/12's cheviot, dark olive brown.
Finish: Cheviot finish; full slightly at scouring, clip on shear, press; 52 inches finished width.

Two Colored Diagonal Dressgood. (Piece Dye.)

Warp: 2220 ends, 2/36's white cheviot, in the grey.
Weave: See **Fig. 2**; repeat of pattern 45 warp-threads and 15 picks; 15-harness fancy draw.
Reed: 15 @ 3 ends per dent; 45 ends per inch; 49 inches wide in reed.
Filling: 45 picks per inch, 2/36's white cheviot, in the grey, with cotton.
Finish: Scour well, piece dye blue, clear on shear; 44 inches finished width.

Worsted Suiting.

Warp: 4460 ends, 2/36's worsted.
Weave: See **Fig. 3**; repeat 8 warp threads and 8 picks; 8 or 16-harness straight draw.
Reed: 17 @ 4 ends per dent; 68 ends per inch; 65½ inches wide in reed.
Dress: 1 end black.
1 " gray and white twist.
3 ends black.
3 " gray and white twist.
—
8 ends in repeat of pattern.
Filling: 64 picks per inch, 2/36's worsted; arranged thus:
3 picks gray and white twist.
3 " black.
1 pick gray and white twist.
1 " black.
—
8 picks in repeat of pattern.
Finish: Scour well, clear on shear, press; finished width 56 inches.

Worsted Suiting.

Warp: 4400 ends, 2/36's worsted, all gray mix.
Weave: See **Fig. 4**; repeat 8 warp threads and 8 picks; 8 or 16-harness straight draw.
Reed: 16½ @ 4 ends per dent; 66 ends per inch; 66¾ inches wide in reed.
Filling: 66 picks per inch, 2/36's worsted, all black.
Finish: Scour well, clear on shear, press; finished width 56 inches.

Worsted Suiting.

Warp: 5180 ends, 2/52's worsted.
Weave: See **Fig. 5**; repeat 12 warp threads and 12 picks; 12-harness straight draw.
Reed: 13 @ 6 ends per dent; 78 ends per inch; 66½ inches wide in reed.
Dress: 1 end green.
1 " brown.
—
2 ends in repeat of pattern.

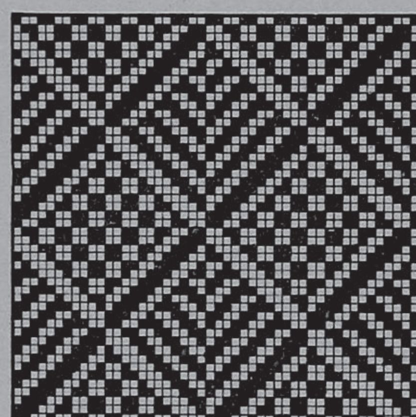


Fig 1

Fig 3

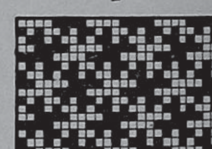


Fig. 4

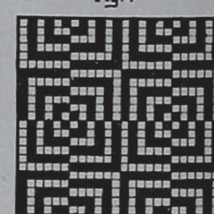


Fig. 5

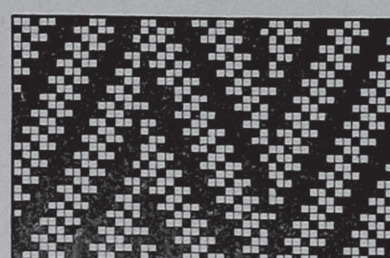


Fig 2

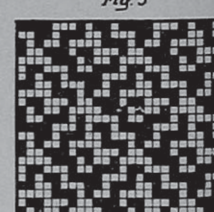


Fig. 6

Filling: 74 picks per inch, 2/52's worsted; arranged thus:
1 pick blue.
1 " green.
—
2 picks in repeat of pattern.
Finish: Scour well, clear on shear, press; finished width 56 inches.

Worsted Cloaking.

Warp: 4604 ends, 2-fold 2/52's worsted.
Weave: See **Fig. 6**; repeat 12 warp threads and 12 picks; 12-harness straight draw.
Reed: 16½ @ 4 ends per dent; 68 ends per inch; 68 inches wide in reed.
Dress: 1 end brown.
1 " brown and drab twist.
—
2 ends in repeat of pattern.
Filling: 50 picks per inch, 2-fold 2/52's worsted, arranged thus:
1 pick brown
1 " brown and drab twist
—
2 picks in repeat of pattern.
Finish: Scour well, clear face on shear, 56½ inches finished width.

DIRECTORY OF TRADE MARKS RELATING TO THE TEXTILE INDUSTRY.

Registered September, 1910. *(Complete.)*

1. Cotton Piece Goods.—Kassel Simon, New York.

2. Cotton Piece Goods.—A. G. Hyde & Sons, New York.

3. Hosiery.—Gehrke Knitting Mills, Reading, Pa.

4. Hosiery.—Klusewitz Bros., Reading, Pa.

5. Shirts.—Konig & Stolz, New York.

6, 7 and 8. Linen and Wool Piece Goods.—Edouard Leurent, Tourcoing, France.

9. Overalls and Men's Work-Shirts.—Kerfoot-Miller and Company, Oklahoma, Okla.

10. Gloves, Hats, Caps, etc., With Their Trimmings.—Thomas G. Plant Co., Boston.

11. Children's Woolen, Cotton, and Linen Knitted and Woven Underclothing.—Brown Durell Co., Boston.

12. Cotton Cords.—Samson Cordage Works, Boston.

The Paterson Industrial Exposition.

The Paterson Industrial Exposition which opens in the Silk City November 9th, and continues until the 19th, bids fair to be the forerunner of a great National Silk Exposition, if the interest the silk men are taking in the coming exposition is an indication of future achievements.

At the Paterson Exposition, silk production is to be shown in all its branches, from cocoon to the finished fabric.

The success already made with the silk exhibition features, of the exposition, indicates that in another year the hope of the silk manufacturers for decades will be realized. The Exposition is not devoted to the silk industry entirely, but on account of the prominence of the silk industry in Paterson, the silk section will receive greater attention and be better represented than the others.

There are no less than two hundred and ninety-two firms engaged in the various lines of silk production, located in Paterson, and consequently there is sure to be great interest in the silk section of the Exposition.

The success of the Exposition, from the standpoint of silk production, is evidenced by the fact, that the committee in charge of arrangements for the silk section are all men closely connected with the silk manufacturing industry of Paterson.

This committee on arrangements consists of the following gentlemen:—George Arnold of the American Silk Dyeing and Finishing Co.; Frank Maas of the National Silk Dyeing Co.; Samuel S. Holzman of the Holzman Silk Co., and president of the Ribbon Manufacturers Association, and Samuel McCollom of McCollom and Post, president of the Paterson Broad Silk Manufacturers Association, acting in conjunction with a special committee of silk manufacturers.

The Silk Manufacturers Committee consists of ribbon, broad silks and other manufacturers, with Samuel McCollom as chairman; assisted by Samuel S. Holzman, vice chairman; A. A. Fischer of the Hamilton Silk Co.; Joseph Whitehead of Pelgram and Meyer; Judge Joseph W. Congdon; John Kane of Kane and Wilkinson; Charles Schlaepfer of Naef Brothers & Co.; Charles Mandeville of Charles Mueller and Co.; Ralph Baer of the Helvetia Silk Co.; Arthur Price of Price & Martin; and John Faust.

The Committee of Silk Manufacturers is in charge of the details of the silk section, and it is their intention to have an exhibition of the weaving art as practiced here and abroad.

As this is the Centennial year of power-machinery-made silk, in the U. S., there is a possibility of reproducing the old Hanks Mill at Mansfield, Conn.; the mill in which the first power-driven silk machine in the U. S. was used. The mill at Mansfield is still owned by Hanks descendants, who continue the business of the manufacture of sewing silks as was started there in 1810. There is still a spindle of the first power driven silk machine in existence, and it is possible, if a replica of the mill is secured, that this spindle will be on exhibition. This spindle is of the cog-variety and is a crude affair compared to the highly developed spindle of to-day.

The great feature of the Paterson Exposition will be a Silk Manufacturers Day. This will be of great importance and should attract every silk manufacturer. It is the purpose of the Silk Manufacturers' Committee