

Machinery and Appliances.

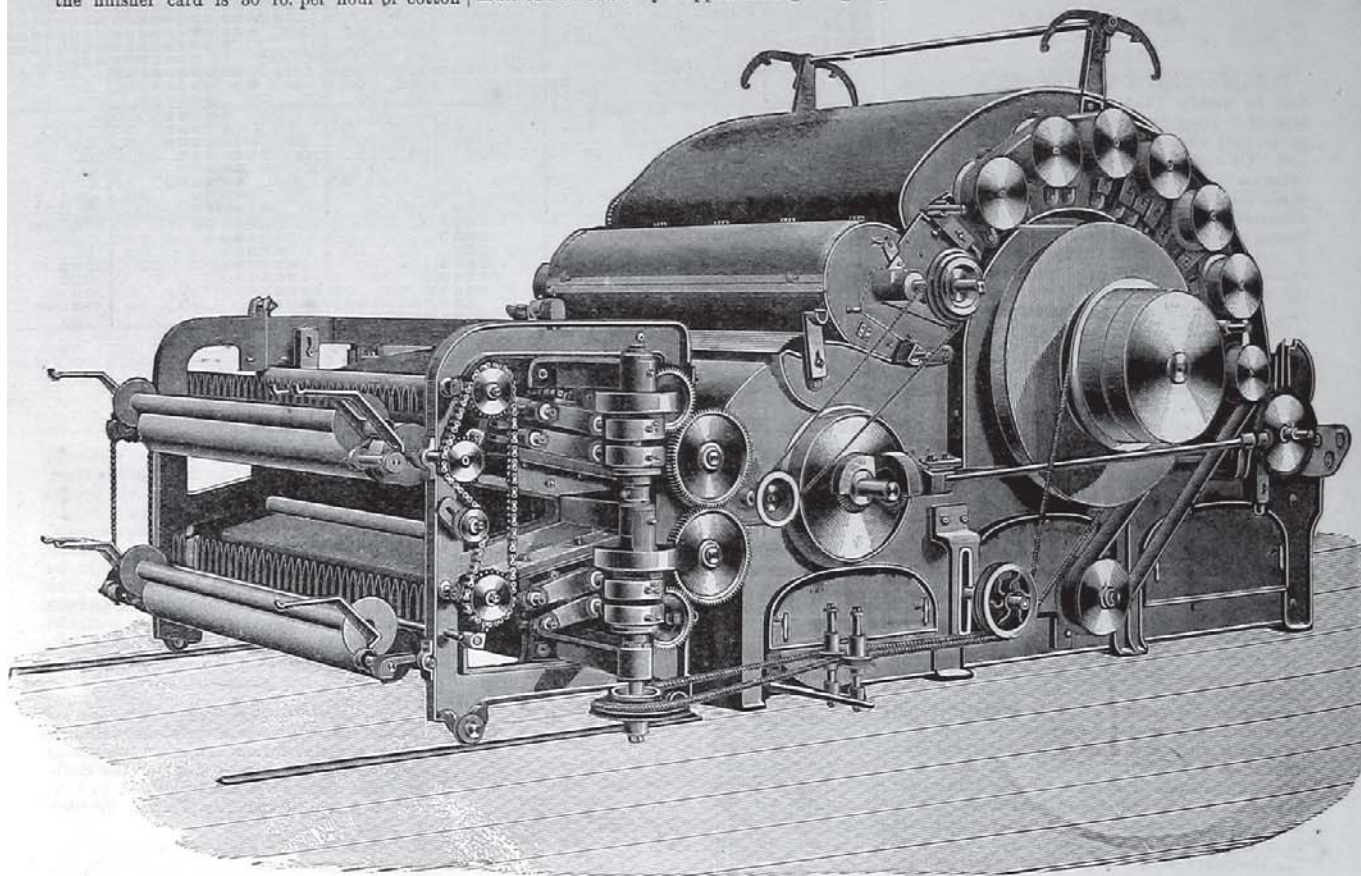
THE PREPARATION AND SPINNING OF BARCHANT AND WASTE YARNS.

II.—CONTINUED.

The finisher card can be supplied with one or other of two condensers, namely, the Saxon or the Bolette condenser, according to the option of the purchaser, who will be governed in his choice by the nature of the material he is going to use. The Saxon condenser is of the latest and most improved form, having leather tapes. The Bolette has steel tapes. Every provision is made to ensure the perfect and continuous division of the web into threads of uniform thickness. The weight turned off the finisher card is 30 lb. per hour of cotton

3in. before the carriage completes its outward run. The carriage then continues its course, the effect being that thick uneven places that have not taken any twist are drawn out, rendered even with the rest, and receive their complement of twist. Others are: A patent rope tightening apparatus for the taking-in; a scroll-band tightening frame; a patent clip for fastening the check-scroll band; a click locking motion; a patent automatic nosing motion; a backing-off chain tightening motion; a long copping rail with loose front automatic incline for regulating the locking of the faller; patent step covers; special arrangements in connection with the drawing-out and taking-in of the carriage, which causes it to stop in cases of obstruction during the drawing-out, and by which the spinning operations will cease automatically, should the cam shaft by accident make its change before the proper time; an arrangement by which the mule can be suddenly stopped during the going

the following motions, in addition to those used in the cotton headstock, as already described, viz.:—A spindle stop motion, a single and double speed, a drawback motion, variable drawing out scrolls in lieu of the "back-shafts." These mules can be made with rim shafts at right angles to the rollers or parallel with them according to requirement, to suit any position of main driving shaft in the building in which they have to be placed. They are made to contain from 300 to 500 spindles, 2in. distance, or can be made 1½in. to 3in. distance. They are constructed on three different systems in the roller parts as follows:—1. With three lines of bottom fluted rollers at small diameters, the front and middle top rollers covered with cloth and leather, and weighted with lever and saddle; the back top roller is solid, 1½in. diameter, polished and self-weighted. All three lines of top and bottom rollers are adjustable so that the distances between front and middle,



FINISHER CARD WITH SAXON CONDENSER.—MESSRS. PLATT BROTHERS AND CO., LIMITED, OLDHAM.

counts No. 3. The observer, whether inexperienced or an expert, will be struck by the regularity of the work, and the quality of the results achieved, and more than all, by the little supervision needed by the machines. We illustrate the finisher card with the Saxon condenser applied.

THE SPINNING PROCESS.

The spinning process in the production of Barchant and waste yarns is performed either on the cotton mule or the woollen mule, according to the purpose for which the yarn is to be used. The cotton mule in its construction differs only in being arranged to spin from condenser bobbins, and having several special appliances to suit the requirements of the article being produced. The first of these is a special motion to disengage the delivering rollers at a distance of from 1in. to

in of the carriage to prevent accidents; a safety catch to keep the mule stopped; special arrangements to disengage the taking-in friction by the going in of the carriage. These various patents are the same as are applied by the makers to their cotton mule. To the woollen and waste mule is applied a stop motion for stopping the mule when the carriage is close up to the roller beam, by which the attendant can stop it from any part of the whole length of the mule when requisite to replace empty condenser bobbins with full ones, or any other purpose, without having to run to the headstock.

THE SELF-ACTING WASTE MULE.

The self-acting waste mule is often constructed on the woollen mule type of headstock for spinning the finer counts of waste and Barchant yarns, say 8's to 12's. This is usually fitted with

and middle and back lines can be altered very easily, and adjusted to requirement. When draught is not required in the rollers the front and middle top rollers can be removed and the back solid top roller placed upon and between the front and middle bottom rollers thus being self-weighted. 2. With one line of top and bottom rollers, the top roller of 2½in. diameter, and self-weighted same as the ordinary woollen mule roller parts. 3. With two lines of bottom rollers and only one line of top rollers, all polished and plain, the top roller resting upon and between the two bottom rollers, the top rollers having no end pivots. This style is growing in favour very much, especially when the engines and condensers are of the best construction.

These mules are made to spin direct from the condenser. The numbers spun range from 2's

spun condensed to 10's cotton counts, either soft or hard twisted yarns. To those who have been accustomed to regard a level yarn as only capable of being made upon the ordinary cotton system, the uniformity in that respect of those produced on this plan will be a great surprise.

The production of yarn is very large; the stretch of mules is generally 72 in., and when spinning 4's and upwards they run 5 draws per minute, producing 7½ lb. per spindle per week of 56½ hours, of 22 hanks from pin cops and 27 hanks from twist.

In very large cotton spinning and manufacturing establishments, and especially in those isolated from the great centres of industry, where waste spinning has become a separate branch of industry, it might be worth considering whether introduction of this system of machinery, and the working up of all the waste made in the establishment, would not be an economical arrangement. To those with whom it is an independent business, and whose machinery may not be up to date, we commend an inspection of the system, for which the makers give every facility, as the most complete that has come under our notice.

The Loonderdass Cotton Spinning Company, Bombay, have just placed their order for flat carding engines with Messrs. John Tatham and Sons, Limited, Rochdale.

The Agra Cotton Spinning Company (through Messrs. James Scott and Company) have placed an order for flat carding engines with Messrs. John Tatham and Sons, Limited, Rochdale. The new flat card, made by this firm is meeting with great favour in the trade.

Bleaching, Dyeing, Printing, etc.

TANNINS IMPORTANT TO THE DYER.

(Continued from page 626.)

VALONIAS

Are the fruit calices of *Quercus græca* and *Quercus Valonia*; they contain 25-35 per cent. of tannin. Good tanning material, also important in the dye-house. The accompanying colouring matter is a dirty yellow.

Having mentioned the most important tannin materials, I have now to speak of the analytical methods by comparative dyeings and of the accompanying colouring matter, and on carrying out dyeing processes in addition.

From my work I have come to the following process:—Of each tannin matter, take 5 grms., subject to extraction, so as to make one litre of extract solution. With 7 litre a cotton skein is to be dyed; and with ½ litre also a prepared garancin strip is to be dyed in a similar way. The colour tones as well upon the cotton skein as on the garancin stripe were all compared with one another and are different. The shade was for each tannin either pale blue grey, dark blue grey, green grey (pale and dark), yellow grey, red grey, brown grey, dark brown, pale brown, yellow, and so on.

Tannin, sumach, myrobolams, divi-divi, and algarobilla, produce different gradations of a most sensible character—blue grey to yellow and green grey with most minute differences. Even so mimosa, valonia, oak bark, chestnut, and pine bark.

Collectively these tannin matters differ from one another, so that a glance at the shades is enough to distinguish the particular species of tannin with complete certainty.

The dyeings themselves should be carried out in the following manner:—

Upon a large water bath with 10-12 apertures for so many dyeglasses, in which the entire series

can be compared together, ¼ litre of each tannin extract, made as above described, is placed in each glass. Then 10 grammes of cotton yarn are placed in each glass and boiled for one hour, the skeins are then lifted up and 20 c.c. of copperas solution (10 grams in 1,000 c.c.) placed in each glass, the skeins returned to their respective glasses and again boiled for half-hour longer, taken out (a distinguishing mark must naturally be supplied to the separate skeins) washed, and dried. The skeins are then examined. As an example of the method: oak bark and chestnut were extracted so that each stood at 0.3 Be; one litre of each was used and cotton was dyed in them after the above method. The cotton in the oak bark extract became a yellow grey, while that in the chestnut extract became a pale reddish grey; mixing both extracts half and half produces on cotton a dirty brownish grey shade.

The dyeings upon cotton prepared with different mordants, as upon the garancin stripe, are still instructive, and it gives the tannins with their different accompanying colouring matters extraordinarily distinct. Especially on the alumina stripes it is found to be clear and sharp, this dyeing of the colouring matter of the tannin.

This condition gave me the idea to separate the colouring matter from the tannins, so as to be able to get pure tannin.

The extract of tannin matter is treated in a suitably diluted condition with alumina acetate; the colour lake, resin, and mucilage of the tannin are precipitated out, and are filtered off. Now, should the solution still be coloured, some sulphur dioxide in a nascent state is mixed with it; the solution is then entirely bleached; then, with a sufficient quantity of lead acetate, the tannin is precipitated out, filtered, and, with the calculated quantity of sulphuric acid, the lead tannate is decomposed with the formation of lead sulphate in an insoluble form, and tannin in aqueous solution; these two bodies are separated by filtration.

With this now cleared and decoloured tannin solution dyeings were made exactly as described above, and there was not a question as to the most minute distinction of the greatest number of the tannin materials. The grey was generally a blue grey, yet with differences in the strength of the tone; the shade of blue grey showed itself to be mostly like that produced by gallotannic acid; such was that from sumach, divi-vivi, oak, algarobilla, chestnut, and Valonia tannins. Mimosa gave a fine but very dark blue grey. Extracts of tannin or gallotannic acid can, by above process, be cleared and decoloured. By this joint clearing and loss of colour eight of the tannin matters becomes completely like tannin, and were compared by the following method with tannin:—

Of each separate tannin a solution standing at 0.3 deg. Be was prepared, in each solution a small skein of cotton of 10 grms. weight was laid for an hour at 60 deg. C: lifted out and placed in one bath at 60 deg. C, of tartar emetic bath, given 10 minutes in this, lifted, washed, and placed in equally strong solutions of acid violet 7 B and comparatively dyed.

Algarobilla, sumach, mimosa, was darker than tannin. Then follow myrobolams, divi-divi, valonia, oak and chestnut. It is singular that the colour tone of algarobilla, sumach, and mimosa were more lively and fiery than the colour tone produced by tannin itself.

A comparative examination of the entire series of the eight most important tannin matters was made, and the results were extraordinarily good.

The first motive in my investigation was the practicability of the dyes named to the production of the most delicate and sensitive colours that could be selected; thus were dyed cotton-blue (dark), methylene blue (pale), smaragad green, safranin B (pale), rose Bengale (pale). With such delicate colours as rose bengale, safranin B, and methylene blue, myrobolams and divi-divi give decidedly more fiery shades than tannin.

The use of the cleared and decoloured tannin matters must in practice be of extraordinary value. I have applied for a patent for my decolouring and clearing process, and extend my claim as well to the application of these

cleared and decoloured tannin matters to the tannery as well as to the dye-house.—Dr. AUGUST FOELSING in the *Leipzig Monatschrift*.

RECIPES FOR DYERS.

The following are mostly translations from foreign sources. We do not guarantee the results from these recipes, but give them for the purpose of showing our readers what their foreign competitors are doing.

DYEING OLIVE GREEN ON CLOTH.

FIRST METHOD.

For two pieces of 10 kilos. The goods are previously well wetted. Dye in a bath with

150 grams. Orange O.
200 " fast or azo yellow,
60 " acid green,
1½ litres sulphate of indigo.

Boiling for half-an-hour; add

6 kilos. tartar preparation,
60 grams. acid green,
100 " picric acid.

Cool, enter, boil for three-quarters of an hour, then add

100 grams. picric acid.

Indigo carmine can be used for the sulphate of indigo.

Indigo Extract.

1-2 lb. finely ground indigo placed in pots are slowly mixed with 4-8 lb. Nordhausen sulphuric acid; this operation should take 1½ hours, and the mixture be well stirred after every addition. This indigo extract is then allowed to stand for one day. It is usual to pour the produce of the indigo into 10 litres of water.

SECOND METHOD; PRODUCED WITH DYE WOOD IN ONE BATH.

For three pieces of 14 kilos. the goods are previously well wetted. Dye in a bath with

25 kilos. tartar chips,
200 grams. tartar,
500 " Sumach.

½ scoop indigo sulphate.

Boil for two hours; then add

2 kilos. bluestone,
1½ scoop indigo sulphate.

Cool, enter, boil for one hour, then add

1 can logwood liquor.

Boil for half-an-hour.

1 scoop indigo is equal to ¼ litres.

1 can logwood is equal to 10 litres, and contains 1 kilo. of logwood.

With fustic and indigo bright shades of green are obtained.

THIRD METHOD; PRODUCED WITH DYEWOODS IN TWO BATHS.

For 12 kilos. mordant with

2 per cent. potash chromate,
1½ " sulphate of copper,
½ " sulphuric acid.

Boil for an hour and a half. Dye in a bath with

8 per cent. fustic extract,
5 " Sumach,
5 " logwood,

At the boil for an hour and a half.—*Färberei Muster Zeitung*.

PROCESS FOR OBTAINING A WHITE PATTERN ON ANILINE BLACK.

This process is particularly suited for cotton articles dyed with aniline black, such as stockings, gloves, &c., on which a pattern in white is desired. The articles are washed and dried, or, if it be wished, bleached and then dried. They are then placed in an aniline mordanting bath, which may be made up as follows:—

Potassium chlorate	2250 grms.
Ammonium Chloride	2400 "
Aniline salt	8000 "
Aniline oil for blue and black	3500 "
Water	50000 "

In this bath they are allowed to soak for some hours, during which they should be repeatedly wrung, so as to ensure the penetration of the liquid, after which they are wrung out and sent into the dyeing chamber; from which they are removed when half dry. The pattern is produced by printing on a discharge of caustic