Machinery and Appliances.

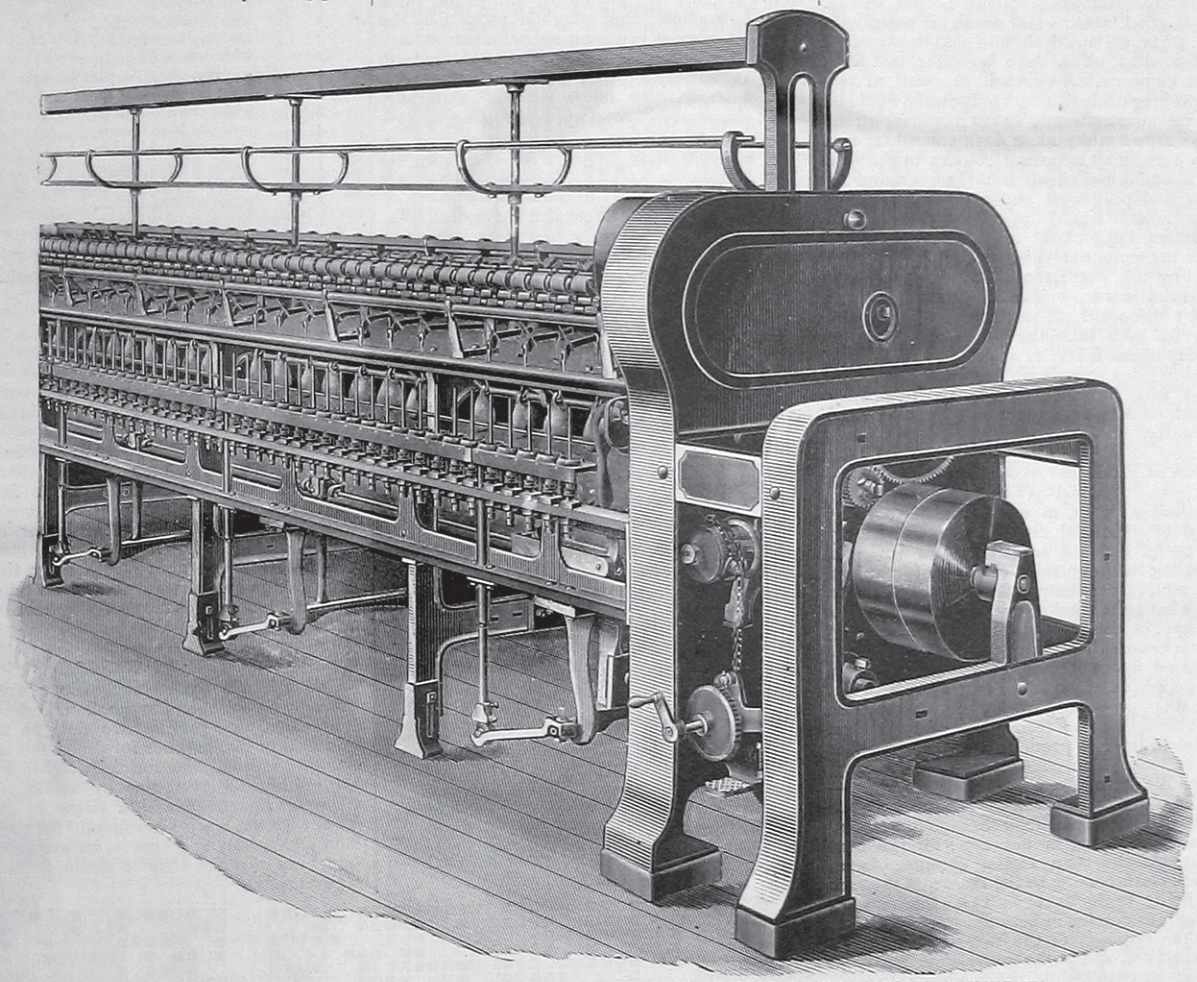
IMPROVED RING SPINNING FRAME.

MESSRS. GUEST AND BROOKES, POLAND-STREET, ANCOATS, MANCHESTER.

Ring frame spinning, which ten or twelve years ago got a foothold in the cotton trade, and very soon subsequently came to the front with such a rush as to threaten to drive every other system out of the field, seems at last to have found its proper sphere, and to have gauged its limits. These, as is well known, are in the lower ranges of the counts of yarn, and within these it has secured a very strong position, from which it would be exceedingly difficult to move it. Nevertheless, it must be admitted that the recent improvements effected in mules have measurably lessened the amount of the advantages claimed—and deservedly so—for the newer machine. Mule makers indeed found a step forward to be an imperative necessity, and by what they have achieved they have quieted the apprehensions that had arisen, both in their own minds and in those of spinners. Still, so firm is the conviction in the minds of the trade that the ring frame possesses unequalled advantages in some respects and for some purposes, that all our leading makers endeavour to cater for the demand which thence arises.

We have much pleasure in bringing before the notice of our readers an improved ring frame, made by the firm whose name heads this notice. Messrs. Guest and Brookes have been associated with the construction of the ring frame from the first attempts to introduce it into this country, being at that time managers in the late firm of Messrs. John Elce and Co., of this city; while on the relinquishment of business by that firm they formed their present partnership. One of the machines of which the new firm has made a speciality is the ring frame, an illustration of their latest and most improved type of which is given herewith. The machine is an excellent one, the greatest care being given to all the details of its construction, and improvements having been effected in numerous points. The illustration shews part of a frame containing over 500 spindles of 2⅛ in. gauge, 1⅜ in. diameter of ring, and adapted for a 5 in. lift of bobbin. All the rails are planed at the ends, and the brackets carefully adjusted to their positions. The spring pieces are planed to receive the double rails, and the latter are planed in the bearings. The front faces are glazed. The thread boards are of polished bay-wood, hinged separately to each spindle, and fitted with improved thread board lifting motions, which lift the thread boards simultaneously on both sides, when required for doffing. The thread board is worked by a handle at the driving end of the frame. The bearings are of cast-iron steps, with oil dishes and rings. The vertical rods, technically called 'pokers,' are lifted by levers, operated at the gearing ends by means of the building motion, which consists of a well and carefully formed heart cam. The rollers are weighted by saddle and lever; the two front lines are covered, and the back line is polished. The ring rails are flanged, and are carefully and truly bored to take up the rings. The bearings of the brackets are more than ordinarily long, which gives increased strength and diminished risk of shaking to the parts. The top clearers are spaced. The roller stands are inclined at an angle of 35°; this, of course, can be varied according to the requirements of purchasers. The 35° is a favourite inclination with Continental spinners. The machine is fitted with a vertical creel in two heights, and a bobbin box.

In extra long frames, or in places where it is required to spin coarse and fine counts, and where the line shaft cannot be accelerated to give the speed at which these machines are adapted to work, the makers apply a specially arranged system of driving, by which high speeds can easily be obtained. This is especially advantageous on the Continent, where mills are so generally driven by water. It consists of two pulleys of equal diameters, and grooved to take two ropes, fixed on the tin rollers; the counter driving pulley or change rim is fastened to the driving shaft, which is fixed upon a bracket carried upon the fender end. These rims can be changed when required. The bands are tightened by means of a tension pulley placed upon the gearing end of the fender.



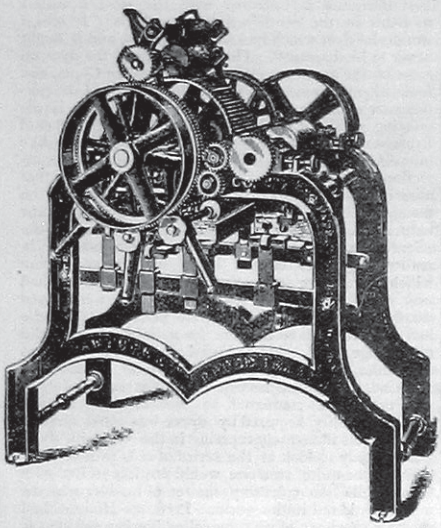
IMPROVED RING SPINNING FRAME.—MESSRS. GUEST AND BROOKES, POLAND STREET, ANCOATS, MANCHESTER.

From this description our readers will easily satisfy themselves that the machine is very carefully constructed and finished, with the purpose of securing high-class work from it, and great durability. Any further information will be readily afforded by the makers, on application at the above address.

FINISH FOR FUSTIANS.—Two lb. cocoanut oil soap, 1¼ lb. brown glycerine, and 5 gallons water. This is sufficient for 4 to 5 pieces of about 30 yards. The soap is made from 45 lb. cocoanut oil, 32 lb. caustic soda at 60° Tw., and 8 gallons water.

FOUR-COLOUR WARP YARN PRINTING MACHINE.

An ingenious device for the printing of warp yarns in various colours in one operation is herewith illustrated. It is an American patent, and is made by a firm at Pawtucket. The machine is designed for printing worsted, silk or cotton warp yarns in from one to four colours, and it is claimed to be one of the best and easiest working machines of its kind which has yet been introduced for this purpose. It is run by power, and will print one or more colours, as may be desired, on the same strand of yarn. It will print from the beam from 500 to 1,000 threads at one time, having each colour on the yarn an equal distance apart, and



every thread passing separately through the machine, so that it does the best of work. It has given entire satisfaction to those who are using it. It does not require an expert to run the machine, for when once set it is claimed that it will never vary nor get out of place. We gather these few particulars from an American contemporary, the *Manufacturers' Review*.

Bleaching, Dyeing, Printing, etc.

PAPERS ON BLEACHING.—XIX.

(*Continued from page* 375.)

Having so far dealt with the scouring of wool, we may now turn our attention to the actual bleaching of the fibre. So far, all that has been done has been to extract the grease and dirt out of the wool; this is absolutely necessary before it can be bleached, as it is almost, if not quite, an impossibility to bleach greasy wool.

The wool fibre has to be treated very differently from the cotton fibre. It will not stand the action of as powerful bleaching agents, and consequently weaker ones must be used. This is a decided disadvantage, for whereas with cotton the colouring matter is effectually destroyed, so that the bleached cotton never regains its original colour, the same is not the case with wool, especially with sulphur-bleached wool: here the colouring matter of the fibre is, as it were, only hidden, and will, under certain circumstances, return. The two materials used for bleaching wool are sulphur and peroxide of hydrogen; the latter is only just coming into use for this purpose.

Sulphur Bleaching.—Bleaching wool by sulphur is a comparatively simple process. A sulphur house is built, the usual size being 12 ft. high, by 12 ft. broad, and about 17 feet long; brick is the most suitable material. The house should have well-fitting windows on two sides, and good tight doors at the ends. Some houses have a small furnace at each corner for burning the sulphur; two of these furnaces are fitted with hoods, so that the sulphur gases can be conveyed to the upper part of the chamber; but a better plan, and the one mostly adopted where the chamber is used for bleaching pieces, is to construct a false perforated bottom above the real bottom of the chamber, the sulphur being burnt in the space between the two floors. If yarn is being bleached the hanks are hung on wooden rods or poles in the chamber; it pieces are being treated, then an arrangement is constructed so that the pieces, which are stitched together, are passed in a continuous manner through the chamber. When all is ready the chamber doors are closed, and the furnaces are heated; some sulphur is thrown upon them, which, in burning, evolves sulphur dioxide gas—sulphurous acid—and this, acting upon the wool, bleaches it. The great thing is to cause a thorough circulation of the gas through every part of the chamber, so that the yarn or pieces are entirely exposed in every part to the bleaching action of the gas. This is effected by causing the gas to pass into the chamber at several points, and seeing that it passes upwards to the ventilator in the roof of the chamber. Generally speaking a certain quantity of sulphur, depending upon the quantity of goods being treated, is placed in the chamber and allowed to burn itself out, the quantity used being about 6 to 8 per cent. of the weight of the goods. After the sulphuring the goods are simply rinsed in water and dried.

Sulphur bleaching is not an effective process: the colouring matter is not actually destroyed, having only entered into a chemical combination with the sulphur dioxide to form a colourless compound, and it only requires that the wool be treated with some material which shall destroy this combination to bring the colour back again in all its original strength; washing in weak alkalies or in soap and water will do this. Another defect of sulphur bleaching is that in the process some sulphur is volatilised in the free form, which settling upon the wool causes it to turn yellow, and this yellow colour cannot be got rid of.

The goods must be thoroughly rinsed with water after the bleaching, the object being to rid the wool of traces of sulphuric acid, which it often contains, and which if left in would in time cause the disintegration of the wool. Sometimes the wool is washed in a little weak ammonia or soda liquor, but this is not advisable, as there is too much tendency for the colour of the wool to come back again, owing to the neutralising of the sulphur dioxide by the alkali.

Instead of using the gas, the sulphur dioxide may be applied in the form of a solution in water. The goods are then simply steeped for some hours in a solution of the gas in water until they are bleached; then they are rinsed in water and dried. In this method it is important that the solution of the gas be freshly made, otherwise it is liable to contain little sulphurous acid but plenty of sulphuric acid, which has no bleaching properties, but on the other hand is liable to lead to damage of the goods if it be not washed out afterwards.

A better method of utilising the bleaching action of sulphur in a liquid form is to prepare a bath of bisulphite of soda, and acidify it with hydrochloric acid; then to enter the wool, stirring well for some time, and allowing it to steep for some hours; next to expose to the air for a while, and rinse as before.

It is better to allow the wool to steep for about an hour in a simple bath of bisulphite, then to enter into a weak hydrochloric acid bath for a few hours. The acid liberates sulphur dioxide in a nascent condition, which then exerts a more powerful bleaching action than if it were already free.

Even with liquid bleaching the bleach is not any more perfect than it is with gas bleaching: the colour is liable to come back again on being washed with soap or alkali, although there is a freedom from the defect of yellow stains being produced.

Goods properly bleached will stand exposure to air for some considerable time, but those imperfectly bleached exhibit a tendency to regain their yellow colour on exposure to air. One fault which is sometimes met with in sulphur bleaching is a want of softness in the wool, the process seeming to render the fibre harsh. Washing in a little weak soft soap or in weak soda will remedy this and restore the suppleness of the wool; at the same time care must be taken that the alkaline treatment is not too strong, or otherwise the bleaching effect of the sulphur will be neutralised, as pointed out above.

(*To be continued.*)

CHROMIUM FLUORIDE, THE NEW CHROME MORDANT.

Chromium fluoride has been proposed by Kopp as a substitute for acetate of chrome. It is sold in the form of a green crystalline powder, containing 60 per cent. of anhydrous fluoride and 40 per cent. of water of crystallisation; it has therefore the formula $Cr_2F_6+8H_2O$. As to its value as a mordant many trials have been made in comparison with the acetate. Colours were prepared as follows:—55 grms. alizarin, 45c.c. acetic acid, 200c.c. thickening, and 30 grms. chrome acetate; and a similar colour in which 30 grms. of fluoride was substituted for the acetate was also prepared. Fents were printed with these colours, and treated in the usual way. With the acetate, fine claret shades were obtained; while with the fluoride lighter and slightly yellower shades were the result.

Other alizarine colours were tried: cœruleine shewed large differences in the shades produced with the two mordants, while with alizarine blue, Persian berries, and anthracene brown the advantage was still on the side of the acetate.

Experiments were also made in another manner—the acetate and fluoride were made into colours, printed on, steamed, and fixed by passing through a soda bath. The oxide of chrome fixed on the fibre with the fluoride is more fiery in tone than that fixed with the acetate.

The mordanted fents were then dyed in the alizarine colours—gallocyanine, anthracene brown, Persian berries, alixarine orange, alizarine black, alizarine blue, and alizarine. There was very little difference in the depth of the colours produced in this way. For printing, therefore, fluoride does not shew much advantage over acetate.

As a mordant for dyeing, comparative experiments were made with equal quantities of oxide of chrome, in the form of fluoride and acetate, and of an alkaline solution. The latter mordant gave brighter shades than either of the others, and it was found that with an alkaline chrome mordant the colour could be more easily discharged than with either acetate or fluoride; the latter is the most difficult to discharge. The cost of the fluoride is about the same as that of the acetate.

Messrs. Read Holliday and Sons have placed on the market a new brand of serge blue, which is brighter and stronger than former brands.

A mixture of tartar emetic and sodium chloride is more soluble than tartar emetic, and this property may be taken advantage of to prepare stronger fixing baths than if tartar emetic be used alone.

By preparing cotton with stannate of a soda at 15° Tw., allowing to steep for two hours, and then passing through sulphuric acid at 7° Tw., the fastness of many colours, such as methylene blue or patent blue, is increased.

A brilliant red pigment, which may be used as a substitute for vermilion or chrome red, can be made as follows:—30 lb. freshly precipitated alumina, in the form of a paste, containing 8 per cent. of alumina, is mixed with 20 gallons water. A solution of 1 lb. sodium salt of eosin in 2 gallons water is added to the alumina paste, then is added 5 ozs. rhodamine dissolved in 3 gallons water. After standing 2 hours the lake which is formed is filtered off and pressed. This pigment may be used in calico printing by the pigment styles.