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 subsequentially 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 posi-

tion, 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 machines. Male makers indeed found a step forward to be an imperative necessity, and by what they have achieved they have quitted 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 unequaled 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 specialty is the ring frame, on 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 shows part of a frame containing over 500 spindles of 2½ in. gauge, 1½ in. diameter of ring, and adapted for a 5½ ft. 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 doubling. 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 back line 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 slack 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 gear end of the fender.

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 FUSTINS—Two lb. coconut oil soap, 14 lb. brown glycercine, and 5 gallons water. This is sufficient for 4 to 5 pieces of about 30 yards. The soap is made from 45 lb. coconut oil, 32 lb. caustic soda at 60° Tw., and 8 gallons water.
THE TEXTILE MERCURY

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, as may be desired, on the same strand of yarn. It will print from the beam from 500 to 1,000 yards at one time, having each colour on the yarn an equal distance apart, and burning the sulphur; two of these furnaces are fitted with hoods, so that the sulphur gases can be conveyed to the outside of the chamber; there is also a passage over the chamber, but a better plan, and the one most adopted where the chamber is used for bleaching pieces, is the one below the furnace perforated bottom above the real bottom of the chamber, the sulphur being burnt in the space between the two floors; when the yarn had been bleached the hanks are hung on wooden rods or poles in the chamber; pieces are being treated, then an arrangement is made so that the pieces, which are stitched together, are passed in a continuous manner through the chamber. When all the chamber doors are closed, and the furnaces are heated; some sulphur is thrown upon them, which, in burning, evolves sulphur trioxide—sulphuric acid—and this, rising 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 9 per cent. of the weight of the goods. After the sulphuring the goods are simply rinsed in water and dried.

Bleaching is not as effective a process; the colouring matter is not actually destroyed, having only entered into a chemical combination with the sulphur dioxide to form a coloured compound, and it only requires that the wool be treated with some material which will 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 setting upon the wool causes it to turn brown, and this yellow brown 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 discolouration 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 steeped for some hours in a solution of the gas in water until they are bleached; then they are rinsed in water and dried; method is it important that the solution of the gas be freshly made, otherwise it is liable to contain little sulphuric acid or free sulphuric acid, which has no bleaching properties, but on the other hand is liable to lead to damage of the goods if it is not washed out afterwards.

A better method of utilizing the bleaching action of sulphur in a liquid form is to prepare a bath of sulphuric acid, 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 one-fourth of its simple bath of sulphuric acid, then to enter into a weak hydrochloric acid bath for a few hours, and liberate the sulphur dioxide in a nascent condition, which then exerts a more powerful bleaching action than if it were simply washed with soap or alkali, although there is a freedom from the defect of yellow stains being produced by sodium sulphide.

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 yarn, which is due to the fact that the bleaching is not a true chemical process, but merely the removal of the colouring matter and does not affect the keratin. Washing in a little weak soft soap or in weak soda will remedy this and restore the softness of the yarn. It must be noted 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 DORDANT.

Chromium fluoride has been proposed by Kopp as a substitute for acetate of chrome. It is sold in the form of anhydrous chromium hexafluoride powder, containing 90 per cent. of anhydrous fluoride and 10 per cent. of water of crystallisation; it has therefore the formula CrF₆·0.6H₂O. As to its value as a mordant many trials have been made in comparison with the acetate. Colours were prepared as follows:—5 grams alizarin, 40 c.c. acetic acid, 200 c.c. thickening, and 30 grams chrome acetate; and a similar colour in which 30 grams of the above fluoride were obtained; while with the fluoride lighter and slightly yellower shades were the result. Other alizarins in some cases showed large differences in the shades produced with the two mordants, while with yellow blue, Persian green, and amethystine blue, 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 colour of chrome fixed on the fibre with the fluoride is more fery in tone than that fixed with the acetate.

The mordanted fents were then dyed in the same manner with such colours as gallicaceous auburn brown, Persian berries, alizarine orange, alizarine blue, and alizarine black. There is very little difference in the shade of the colours produced in this way. For printing, therefore, fluoride does not show much advantage over acetate.

As a mordant for dyeing, comparative experiments were made with equal quantities of ozone of chrome, in the form of chrome and acetate, and of an alkaline solution. The latter mordant gave brighter shades than either of the others, and it was found that the claret shades of the 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. REED 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 75 T., allowing to steep for two hours, and then passing through sulphite of soda at 75 T., the fastness of many colours, such as methystine blue or patent blue, is increased.

A brilliant red pigment, which may be used as a substitute for vermilion or chromate 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 5 gallons water is added to the alumina paste, then 5 lb. rhodamine dissolved in 3 gallons water. After standing 2 hours the lake which is formed is filtered and pressed. This pigment may be used in calico printing by the pigment styles.