

## Machinery and Appliances.

### IMPROVED SCUTCHER.

MESSRS. LORD BROTHERS, TODMORDEN.

Continuing our notice of Messrs. Lord Brothers' recent improvements, the next machine calling for description is the scutcher.

The first improvement we note here is in the construction of the feed rollers, which are now made with coarser flutes and chasings than formerly. This gives them a firmer grip upon the material, preventing the beater pulling it through in lumps. The rollers are all made from cast steel, and the feed roller steps are bushed with brass, so that steel and brass work in contact.

The second point calling for remark is an improved construction of the cotton holders, the series of levers forming which constitute "the piano feed" or "pedal motion" of this well-known machine. The improvement consists in the substitution of an open bearing for

directed, and from which they can be lifted out with the greatest ease for cleaning, and restored with the same facility.

Another improvement is the introduction of a balance weight, or counterpoise to the weight of the cone strap and its levers, which renders the cone strap much more sensitive, and easier to move, greatly improving the results. Another improved arrangement has been resorted to, by which oil is prevented getting upon the surfaces of the cones, which caused the strap to slip, and so resulted in irregular action. All the bearings of the calender and delivery rollers are bushed with brass.

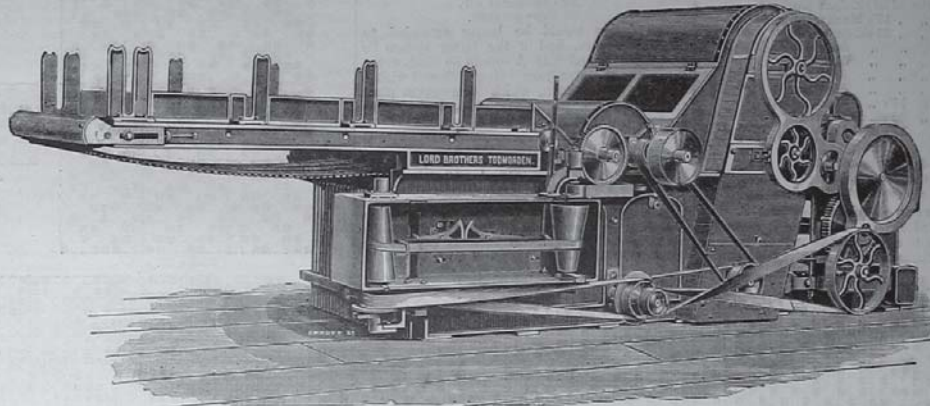
To prevent the laps "licking" when unrolling, which has been the cause of much bad work, one of calender rollers has been made to run at a little greater speed than the other, which has the effect of smoothing down the fibres, so preventing them interlocking with those of the other surface, and permitting their easy subsequent separation.

It will be apparent that this machine has been thoroughly overhauled, and every possible point improved where any room for it was discoverable.

### A NEW SILK WINDING MACHINE.

An ingenious machine for winding silk was shewn at the recent Paris Exhibition, and attracted considerable attention amongst those interested in this branch of the trade. It is stated that Mr. John Keats, of the firm of Batley & Keats, 10, Bourg l'Abbe, Paris, while at Scutari, and watching the departure of camels loaded with spools of silk for the Persian capital, had his attention first directed to the disproportion in weight of silk to spools, the latter being 75 per cent. of the total weight. As the average loss of camels on this journey is 10 per cent., it struck him that if the burden could be properly reduced there would be a great economy effected in camel flesh, maintenance, and superintendence. A brief period of thought enabled him to devise a plan by which silk could be wound without making it square or causing it to kink, and which would abolish the spools used in the commerce of silks and the reels for the sewing machine, and at the same time give the worker the wound silk or thread of equable strength, suitable for hand or machine use.

The silk winding machine thus originated was



IMPROVED SCUTCHER.—MESSRS. LORD BROTHERS, TODMORDEN.

the cylindrical one formerly in use. This gives greatly increased facility in lifting out any single lever for cleaning or any other purpose, as it obviates the necessity of driving out the shaft, which was necessary before.

Experience has shown that the nose of the lever cotton holder requires to be carefully adapted to the staple of the cotton it is intended to use. Accordingly, Messrs. Lord Bros. have given this point their careful attention and consideration, and have constructed various modifications, which are applied according to their suitability for the requirements of the purchaser.

The pendant bars or levers hanging from the cotton holders have been furnished with two chilled iron bowls or pulleys,  $\frac{3}{4}$  inch diameter, instead of the larger one formerly in use. This change has been introduced because it increases the liberty of movement of the levers. Previously, when two levers together were ascending, it might be at slightly different speeds, there was a tendency for the movement to become impeded, because of the effort to reverse the action of the bowls. With the alteration they now help one another, the result being freer action and, of course, a more perfectly even lap. The pulley box has also been improved by the construction of a recess at one end, into which the pulleys can be

It will be obvious, from what has been said, that Messrs. Lord Brothers are determined to keep pace with the requirements of the times in making their machines as perfect for their various purposes as possible. Should our readers desire any additional information to what has already been given, the firm will be happy to give it on application as above.

**CARDS IN FALL RIVER.**—In a cutting from the Fall River *Evening News*, supplied to us by a correspondent, and inserted in our issue of the 4th inst., the writer stated that "Messrs. Dobson and Barlow, of Bolton, have a representation in one mill." The writer in our Fall River contemporary must have made a very superficial tour amongst the mills of that city, or was not a very careful observer. We can authoritatively state that the firm is represented by its cards in numerous mills to the extent of hundreds of machines. Unfortunately, too many writers on the technical press of the United States are pressmen only, and hence, in dealing with these matters, are, unfortunately, very prone to err.—*Ed. T. M.*

A Canadian order-in-council has been passed, placing on the free list, until the end of next season, cotton yarns finer than No. 40, unbleached, bleached, or dyed, now free of custom duty, for use in the manufacture of Italian cloths, cotton or worsted or silk fabrics, when imported for the manufacture of cotton loom harness.

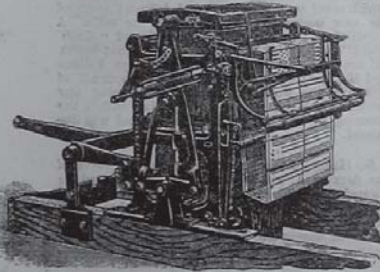
one of seventeen new inventions shewn at Paris, won for him the Grand Prize, and many visitors watched with interest the silk being wound from the twelve bobbins upon the star discs, a prominent feature of the new machine. The star disc is a card with rounded corners on the circumference of the circle, that being the only form of the card that would take the lay of the thread or silk automatically until filled. They are made in various sizes adapted to all the requirements of the trade. They range from  $2\frac{1}{2}$  in. diameter upward, and the radial points range from 5 to 11, always being odd numbers, as even numbers would not meet the requirement and take off the spinning. The winding frame is about 3 ft. high by 2 ft. long and 1 ft. wide, and the discs are mounted on a carrier with a rod to keep them from moving, except as the carrier turns.

**NEGOTIATING FOR A PLUSH PLANT.**—A Philadelphia journal says:—"We have information from good authority that Lister and Company, the large English plush manufacturers, are treating with the owners of an extensive American plush mill regarding a purchase, and, if an agreement on price can be reached, the sale will doubtlessly be made, as the American owners are willing to sell. As stated in these columns some months ago, two representatives of Lister and Company made a tour of this country, and looked the ground over with a view of establishing a plant, and one of them has settled in New York as the agent of Lister and Company's products."

### NEW RAISE AND DROP SHED JACQUARD.

This jacquard, an illustration of which is presented in the accompanying cut, on account of its simplicity of construction, effectiveness, and durability, has grown rapidly into popularity among manufacturers in the United States, ever since its introduction into the market, until at the present time its superior merits have become universally recognised. Its makers claim that it possesses all the simplicity of the single lift machine, yet having most of the advantages of the double lift machine, as well as many other important features, which the latter does not possess.

In the first place, it possesses the same advantages over the single lift that are claimed for the double lift machine in raising and lowering the warp thread. It has a still greater advantage over both the single and double lift machines, in that the lingoes can be used at least 30 per cent. lighter than on either of them, and in some instances lingoes 30 per cent. lighter can be used. By the improved system of driving levers introduced, the loom will run more lightly and



smoothly than with other jacquards, being more evenly balanced. As it forms a very close shed, the cloth woven upon it always presents a smooth and even surface.

The improved harness and comber board and perfect varnish used in connection with this machine are deserving of mention. There is but one knot in the harness, and that below the neck bands, which are endless. In this way the most of the knots in the neck bands and heddles formed in other harnesses are avoided, and their absence insures greater durability and more perfect cloth. The machine-made heddles will last for years; in fact, they are almost indestructible, and, by their peculiar formation, cannot chafe the warp. Another point to which attention is called is the ease with which these machines can be put in operation, and the arrangement is so simple that the various grades of light and heavy goods can be woven without difficulty.

There are other minor improvements, which, combined with the advantages already mentioned, make this jacquard and harness suitable especially to the manufacture of goods requiring a smooth finish. There are, it is said, more than ten thousand of these machines in operation.

**THE TURKISH TOWAL CASE.**—The action of "Barlow and Jones v. Johnson and another," was mentioned on Wednesday to Mr. Justice Chitty, who was asked by Mr. Romer, Q.C., to fix a day for the hearing of the action, as it was desirable a day should be named, there being thirty or forty witnesses to bring up from the North. Mr. Justice Chitty, however, refused to appoint a day, as other cases coming before this one might be part heard, and it would be unfair to the parties in those cases if this action were allowed to interrupt them. Counsel might apply, he said, again later on.

## Bleaching, Dyeing, Printing, etc.

### PRODUCTION OF INSOLUBLE AZO- DYES DIRECT UPON THE COTTON FIBRE.

(Continued from page 23.)

#### END.—THE COMBINATION.

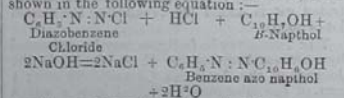
If the acid present in the diazo solution be neutralised by a sufficient amount of caustic soda, contained in the phenol solution, the dye is formed evenly. Of the three molecules of acid which are used in preparing the diazo solution, only one is necessary to decompose the nitrite, and only two molecules remain to be neutralised. Therefore, in preparing the phenol solution, two molecules of caustic soda are used, although only one is required to dissolve the phenol.

It has been found by experience that the colour is developed much brighter upon the fibre, when the diazo solution contains acetic acid and no free mineral acid. However, the diazotisation is better carried out with hydrochloric acid, and the presence of the latter is necessary to give stability to the solution. If, before the diazo solution is used, a quantity of acetate of soda be added to it, acetic acid is formed in it. The free hydrochloric acid liberates the acetic acid from the acetate of soda, and the acetic acid formed changes the chloride of the diazo body into its acetate. It is better to add an excess above the two molecules of acetate of soda which are required.

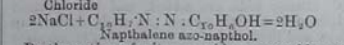
Almost equally as good results are obtained if the third molecule of the excess of hydrochloric acid be neutralised by half a molecule of carbonate of lime. By using this method the acetate of soda is dispensed with, and the process is made cheaper.

In preparing the dyes themselves, the diazo solution is poured into the alkaline phenol solution, but when producing the colours upon the fibre this order is reversed.

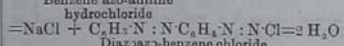
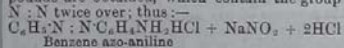
The combination, when aniline and *o*-naphthol are the amino and phenol respectively used, is shown in the following equation:—



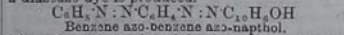
or with naphthylamine and naphthol thus:—



By the action of nitrous acid upon amidoazo bodies, a group of bodies called diazoazo compounds are obtained, which contain the group



When this compound is combined with naphthol a diazoazo dye is produced.



The molecular weights of the chemicals employed are the following:—

1. Hydrochloric acid, HCl 36.5
2. Caustic soda, NaOH 40.
3. Nitrite of soda, NaNO<sub>2</sub> 69.
4. Acetate of soda, NaC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> 3 H<sub>2</sub>O 136.
5. Carbonate of lime, CaCO<sub>3</sub> 100.

1. Commercial hydrochloric acid at 32 deg. Tw., contains about 365 grms. of HCl in a litre; if it is stronger it should be analysed and used accordingly. Thus instead of 100 c.c. (116 grms.) of hydrochloric acid at 32 deg. Tw., only 70.3 c.c. (85 grms.) of acid at 42 deg. Tw. would be taken.

2. Commercial caustic soda must always be analysed. It is best to make a four times normal solution, which contains 160 grms. NaOH in a litre of water. With a 90 per cent. caustic soda 177.77 grms. per litre will be necessary to make such a solution. If a molecule in grms. of

NaOH is required, 250 c.c. of the solution are taken.

3. The nitrite supplied is almost chemically pure, and is easily soluble in water. In order to make a double normal solution 140 grms. are dissolved per litre.

4. Crystallised acetate of soda contains three molecules of water of crystallisation, and is usually somewhat moist. Instead of 136 grms., 140 are taken to allow for moisture. This amount is dissolved in about 600 c.c. water.

5. Carbonate of lime (precipitated chalk) is the best to use, but in its stead, clean limestone or chalk, in a finely powdered state, can be used.

The most important bases and phenols which are used have the following molecular weights:—

1. Aniline, 93.
2. Toluidine, 107.
3. Naphthylamine, 143.
- (*a* or *b*)
4. Nitraniline, 138
- (*Para* and *meta*)
5. Nitro-*para* toluidine, 152
6. Amidoazo-benzene (base) 197
7. Orthamidoazotoluidol (base) 225
8. Naphthol (*a* or *b*), 144.

#### EXAMPLE OF QUANTITIES TAKEN.

	molecular weight.	
1. Molecule nitrite	= 69	= 69 grms.
1. " aniline	= 93	= 93 " "
3. " hydrochloric acid	365 = 364.98	" of 40 per cent. acid.
2. " acetate of soda	= 136	= 300 "
4. " Carbonate of lime	= 100	= 50 "
1. " <i>o</i> naphthol	= 144	= 144 "
2. " Caustic soda	= 40	= 80 " or 500 c.c. of 4 times normal solution.

(To be continued.)

### YELLOW ON BORDEAUX GROUND ON FUSTIAN.

Dye with Congo Corinth upon a jigger; for 60 kilos. of goods use

- 1 kilo. turkey red oil,
- $\frac{3}{4}$  " stannate of soda,
- 3 " soda crystals,
- 14 " soap,
- 600 grms. Congo Corinth,

in 200 litres water at 94 deg. C. For dark shades add 600 grammes Congo Corinth. Dye at the boil for one hour, wash, dry, and print on the

#### DISCHARGE YELLOW.

for which take

- 8.4 kilogram starch thickening,
- 590 " sodium acetate,

warm, add

- 1.15 kilogram chestnut extract 30 deg. B.,
- 2 " acetate of alumina 12 deg. B.

cool, and add the mixture of

- 1 kilogram tin crystals and
- 1 " acetic acid 6 deg. B.

print, steam for one hour, pass through a chalk bath, wash and dry.—*Farb. Mast. Zeit.*

**NIGRISIN** is a new basic dyestuff, made by the St. Denis Dyestuff Co., which gives fine shades of grey on cotton, mordanted with tannic acid and tartar emetic. It is not very soluble in water, and hard water, containing lime, requires to be corrected with acetic or hydrochloric acid before using; 1–3 per cent. of dyestuff is sufficient to give deep shades. For printing, the following colour can be used: 40 grms. nigrisin, 125 c.c. acetic acid, 875 c.c. tragacanth solution; 150 grms. tannin, 150 grms. tartaric acid, 200 c.c. water. After printing, the goods are steamed.

**SULPHATE OF ALUMINA** may be analysed as follows:—1.2 grms. of the salt are dissolved in 5 c.c. of water, and 5 c.c. of a cold saturated solution of ammonium sulphate are added, and the mixture well stirred for a quarter of an hour, 50 c.c. of 95 per cent. alcohol are added and the precipitated ammonia alum filtered off and washed with 50 c.c. alcohol. The filtrate contains all the free acid, which is determined by titrating with alkali. The whole of the aluminium sulphate is precipitated as ammonia alum.