

## Machinery and Appliances.

### ENAMELLED BOBBINS.

MESSRS. WILSON BROTHERS, LIMITED,  
CORNHOLME MILLS, TODMORDEN.

Bobbins in the spinning divisions of our textile industries are like healds and reeds in the weaving sections—very necessary but very costly adjuncts. The ordinary wear and tear of bobbins is always very great, and in spite of the devices of inventors will probably always remain so. There are, however, certain weaknesses of construction that the ingenuity of inventors and the skill of makers have done much to overcome, if not to entirely obviate. Thus the various methods of strengthening them that have been adopted by makers have proved of great benefit in prolonging the life of a bobbin. But we do not remember to have come across any thoroughly good method of protecting bobbins, when once well seasoned, from afterwards warping, swelling, or becoming unbalanced, owing to the changing humidity of the atmosphere to which they are exposed. A similar remark may be made regarding throstle bobbins used in the doubling of fine yarns for the Bradford, Nottingham, and various foreign markets taking the finer two-fold yarns. These bobbins have to be well lubricated to work properly, and the result is that many very speedily become saturated with oil, and so stain the fine and valuable yarn put upon them. When a bobbin of this kind has been made of wood of a loose texture it will become saturated when it has been filled three times, and must then be thrown out for the boiler furnace to avoid a much greater loss. Any method by which this can be effectually prevented we are sure will be welcomed, especially by this section of the trade, as not only will the life of the bobbins be prolonged, but the great loss arising from stained yarn will be prevented.

After spinning or doubling, in very many branches of the textile trades it is a great advantage to be able to condition the yarn before it passes to the next process. With mule-spun yarns this is generally easy, but throstle or frame yarns cannot be so easily treated, because of being upon wood or paper tubes, which cannot or do not usually resist subjection to moisture uninjured. We need not detail the forms of this injury: our practical readers are sufficiently well acquainted with them.

All users of bobbins will be glad to hear of a method by which their troubles in relation to these articles have been overcome, and will, no doubt, make speedy test of its merits. It is a process of enamelling bobbins both inside and out, which makes them impervious to water, proof against the changing humidity of the atmosphere, and obviates all liability to saturation by oil. It is an American invention, and is just being introduced to the textile trades of this country by Messrs. Wilson Brothers, Limited, Cornholme, Todmorden, the well-known and old-established firm of bobbin makers.

The invention has been applied to bobbins, spools, and pirns of all kinds, used in the spinning of cotton, wool, worsted, silk, and linen yarns, and abundant testimonies of its value have been furnished, after considerable experience, by some of the largest spinning companies of the United States. The bobbin is entirely covered with a coating of black enamel,

with a dead lustre finish for the body, and a hard bright lustre finish of jet, or any other colour, for the head or tip. The process has not only been extensively applied to new bobbins, but also to hundreds of thousands of bobbins that have been in use a considerable time, and with results equally satisfactory. Bobbins treated with this process, filled with yarn in the course of usage, after being repeatedly exposed to the action of steam, and then stored in damp cellars for a length of time, are found when unwound not to have suffered in the least, as the moisture cannot penetrate below the surface.

The attention of Messrs. Wilson Brothers had been several times called to the value of the invention, the patent having been secured in this country by the inventors. A personal visit was therefore made to the United States last year by Mr. Wilson, with the result that, by agreement, the exclusive use of the invention for Europe was purchased by Messrs. Wilson Brothers, and, at a considerable cost, a complete plant, on a large scale, has been erected, and for several months has been in operation. Already some extensive orders for new "enamelled" bobbins have been executed, besides a considerable number of small trial orders. About 25,000 old bobbins have also been "enamelled," all of which, without a single exception, have, so far as Messrs. Wilson Brothers can learn, given entire satisfaction. Some of these have been in constant use about four months. From the great success that has attended the process for over three years past Messrs. Wilson Brothers Limited feel justified in claiming for bobbins so prepared the following important advantages:—

1. The enamelled bobbin being completely covered with enamel, inside and outside, is rendered impervious to water, steam, or oil, and is absolutely secure from all injury therefrom.

2. The enamelled bobbin will neither warp, swell, nor contract, but will always fit the spindle it is made for, will run smoothly after repeated steaming, and without rimering will find its place on the spindle.

3. The enamelled bobbin never becomes sticky, hence there is no waste or loss of yarn from this cause, as is often the case with bobbins coated with oil or varnish.

4. The enamelled bobbin, being impervious to oil, cannot become saturated with it, hence no damage to yarn can arise from such a cause.

5. The enamelled bobbin is finished with a hard glass-lustre head or tip, perfectly smooth, and which admits of great friction. It will neither splinter nor become roughened by use, hence the frequent breaking of ends from defective heads or tips is entirely avoided.

6. The durability of the enamelled bobbin is considerably greater than that of the ordinary bobbin—oiled or varnished. The enamel being hard but elastic, will neither crack nor peel, but enables the bobbin to resist with scarcely perceptible injury, repeated blows and knocks received in long ordinary usage.

7. The resistance of the enamelled bobbin to tension and pressure, caused by the contraction of yarn during the steaming or damping process, is greatly in excess of the ordinary bobbin.

8. The enamel can be applied to bobbins, if in good condition, that have been in regular use for a considerable time, providing such bobbins have not become saturated with oil, thus making old bobbins almost equal to new enamelled bobbins.

So far as an inspection of samples will enable us to judge, we can confirm the above state-

ments; and we have no doubt that Messrs. Wilson Brothers will be pleased to afford spinners, doublers, and manufacturers every opportunity of forming their own conclusions upon the merits of the new process, on communication with them, either at their offices, Market-place, Manchester, or at their works at Cornholme, Todmorden.

### PATENT BUFFALO WOVEN BELTING.

MESSRS. JOHN GREENWOOD AND COMPANY,  
LIMITED, TODMORDEN.

The great demand for belting to which the enormous development of our mechanical industries and their continued rapid extension has given rise, has carried the prices of leather belting to such a height that many attempts have been made to find substitutes for this material, which should possess all its good qualities whilst costing less. Generally the substitutes have been one or another kind of woven fabrics. One difficulty, however, beset all early adventures of this sort, that of making a sound, durable edge. All woven belts, but especially those which had to be shifted by means of forks, were liable to fray at the edges, after which they were quickly rendered useless. Of course, this difficulty, like most others, disappeared before the inventive ingenuity of one person and another. A substitute for leather belting has just been brought under our notice in the article named above, which seems to answer very fully all the requirements for which consumers look. It is composed of several plies of woven fabric laid together and stitched in the direction of its length. One of the plies is, however, not woven, consisting of a layer of buffalo hide. The edge of this slightly projects beyond that of the woven material, and so receives all the friction of the fork which may enclose it, and thus it protects the edges, and very effectually indeed, as it is difficult to conceive a more durable substance. It is the best selected Batavian buffalo hide, cut into strips and spliced to form the layers. To give additional strength there are, beyond the usual stitchings with twine to keep the compound fabric solid, one or more stitchings with copper wire, according to the width, which add to the strength. The belt thus constructed is hard, firm, inelastic, and very durable, with sound edges. It is made in any required width, length, and thickness, up to seven plies of woven fabric, four on one side and three on the other of the buffalo ply. It is in addition apparently well protected from the influences of damp, steam, or other enemies of a kindred nature. It is well worth the examination of users, to whom the makers, if addressed as above, will be glad to forward samples.

### TRIMMING AND COLLARETTE ATTACHMENTS FOR RIB KNITTING MACHINES.

The New Looper Trimming Attachment and the Improved Patent Collarette Attachment both of which we illustrate in the accompanying cuts, have been recently placed upon the American market by Mr. Charles Cooper, of Bennington, Vt., U.S.A.

The trimming attachment is covered by recent patents, and besides being adapted to any kind of work, has the advantage of being adjusted to any looper now on the market. It is less liable to get out of order than the ordinary trimming attachment, because of its simple mechanism, and, as shewn by repeated tests, it

does the best class of work, the rate of production being correspondingly increased by the improved mechanism. Mr. Cooper's object has been to produce a trimmer that would give satisfaction in every point, which he claims has been accomplished in this device.

In the collarette attachment, Mr. Cooper has been successful in giving to the trade a device which has met with general approval among knit goods manufacturers. From the time it was placed upon the market, six months ago, the demand has been in excess of the supply, and its maker is now busy filling long-standing orders.

Both of these machines are designed as attachments to the rib knitting machines now being built by Mr. Cooper, and are from new patterns, which greatly improve the general appearance of these well-known machines. They have a new falling bar for regulating the length of stitch, which is durable and easily understood. Another feature is a "short chain" attachment for regulating the length of the rib or border, so arranged that it requires only one-half the length of chain as formerly; and in using different coloured yarns it is impossible for the machine to slip on the wrong side when taking up the various colours. The "royal rib" attachment is another improvement over the old method, from the fact that it ships only the parts necessary to perform its work, thereby saving the wear of the machine. It requires but one chain to make the striped work as well as the "royal" stitch, and can be quickly thrown in or out of work by the operator when so desired. All parts of the machines are made interchangeable, so that if any duplicate parts are ordered they will be found to be exact counterparts of the original.

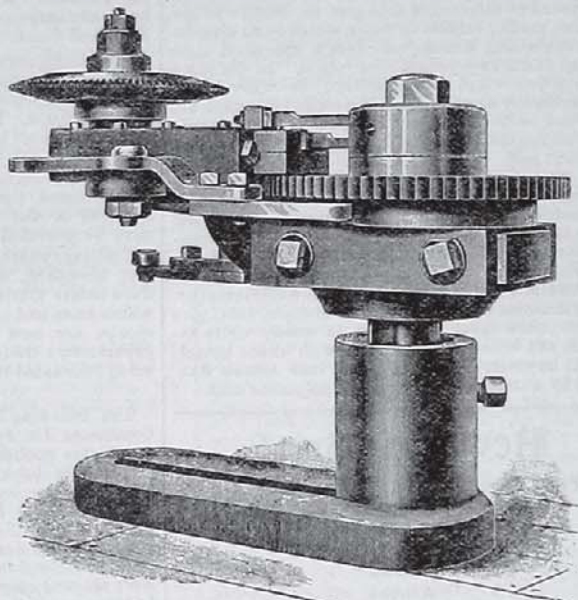
GERMAN AND ENGLISH GOODS IN JAPAN.—The competition of Germany continues to make itself severely felt in the import flannel trade in Japan. Germany's trade in this article is nearly four times what it was in 1887, the figures for 1889, 1888, 1887 respectively being £177,258, £81,320, and £44,453. Probably a certain portion of the flannels entered as German are really of British manufacture, but there are no statistics bearing upon that. So far as the Customs returns show, it would seem that Germany promises to monopolise the growing trade in flannels, as out of the total import of £200,000 in 1889 her record is £177,256, against England's £25,938. Japan's import of Italian cloths from England decreased in value last year in the sum of £11,599. This trade grew from £184,333 in 1887 to £275,770 in 1889. Of this latter sum England's share was £271,252, and Germany's £2,802. In 1887 it seemed as if Germany was about to take a place in the business, for her imports then amounted to £10,263, and in the following year they grew to £13,953. But in 1889 she fell almost completely out of the running. The imports of blankets last year from England shew a decline of £39,067 over the preceding year. The imports of woollen cloths declined £59,017 in value. The total value of England's woollen cloth goods was £113,828, while Germany contributed £35,694. The total trade in this staple fell from £380,948 in 1887 to £160,429 in 1889. England's share in the former year was £264,030, while Germany's was £103,413.

## Bleaching, Dyeing, Printing, etc.

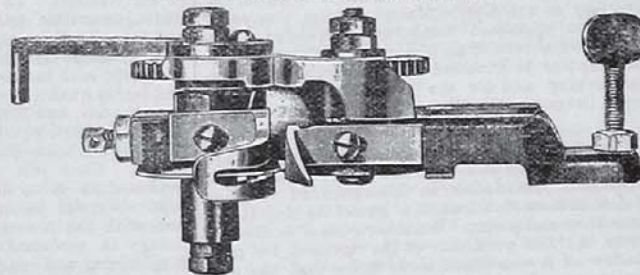
### NEW COLOURING MATTERS.

Messrs. Leopold Casella and Co., of Frankfurt-on-Main, have placed three new coal tar black colouring matters on the market:—Naphthol Black 3 B, Naphthylamine Black D, and Diamine Black RO.

NAPHTHOL BLACK 3 B is another brand of their already well-known naphthol blacks, of rather a bluer shade than any they have yet sent out. It has all the good properties for which the old makes of naphthol blacks are noted—resistance to light, air, acids, etc.



COOPER'S COLLARETTE ATTACHMENT.



LOOPIER TRIMMER.

It is sent out in the form of a bronze crystalline powder which is soluble in water to a dark blue solution, and in acetic acid to a reddish blue solution, but it is insoluble in alcohol. Strong sulphuric acid dissolves it to a greenish black solution, which, on being diluted with water, gives a plum-coloured solution. Caustic soda turns the solution a little bluer. It can be dyed on wool by the usual process, and 1½ to 2 per cent. gives dark navy blues, while 6 per cent., with a small addition of Indian yellow, gives a good black. A new process of dyeing with naphthol black has recently been worked out, which gives better results with less colouring matter than the old method. The goods are first boiled for half to one hour with 5 to 10 per cent. of acetic acid, 7°Tw., or 4 to 7 per cent. of tartar, then the required quantity of dyestuff is added and boiled for from 1 to 2 hours, according to the quality of the wool. Before finishing the dyeing, it is advisable to add a further quantity of acetic acid, which causes the more complete exhaustion of the bath.

The shades obtained are fast to light, they resist dilute acids, strong nitric acid reddens them, caustic alkalis have no action, boiled with soap and water there is a slight tendency to bleed, but there is no staining of whites; so that the dyestuff is well adapted for milled goods.

### NAPHTHYLAMINE BLACK D.

This is another black, which will be found very useful by wool dyers. It is a dark brown, almost black, powder, soluble in water to a dark purple solution, while in alcohol it dissolves to a violet solution. Sulphuric acid forms a navy blue solution. Hydrochloric acid, added to the aqueous solution, gives a reddish purple precipitate, while caustic soda completely precipitates the colouring matter as a dark bluish black precipitate. It is dyed on wool in a bath containing 10 per cent. of Glauber's salt and 5 per cent. of acetic acid; 1 per cent. gives a dark violet shade, 2 per cent. a dark navy, and 4 per cent. a blue black. By using a little acid green or Indian yellow good blacks can be got, while with as little as ¼ per cent. a fine lavender shade can be got. The colour is very resistant to the action of light and air; dilute acids have no action on it, neither has acetic acid, nor strong hydrochloric acid; strong nitric acid gives a brownish yellow spot with blue edges. It resists soaping very well, and is, therefore, useful for dyeing cloth that has to be milled. It is also useful in silk dyeing, for producing dark navy blues, which are very fast to light and acids.

### DIAMINE BLACK RO.

This is another addition to the list of substantive cotton colours, which only came out at the end of 1885, and yet bid fair to surpass the numerous azo-colours for number and variety. Messrs. Casella and Co. offer to dyers a full range of these colours, which they have completed by the introduction of the new Diamine Black. This new colouring matter will be found useful for dyeing dark navy blues and blue-blacks, and even for slates it will find some use. For the production of black it cannot compete either with logwood or aniline; requiring as it does from 6 to 8 per cent. of dyestuff, and about ½ per cent. of green to give a black. It will also be found useful in combination with other substantive colours for the production of modes, olives, browns, and clarets. It is dyed on cotton in a bath of sulphate of soda and soap. The shades so obtained are very fast to light and air; acids have no action on them, and they resist boiling with soap. It is one of the fastest colouring matters that has been sent out.

### LITMUS.

Litmus is a colouring matter prepared from various species of lichens by treating them with ammonia and potassium carbonate in presence of air, whereby a kind of fermentation is established. When the mass has become violet, stale urine, lime, and potashes are added, and the fermentation is continued until the mass has assumed a blue colour; it is then made up into tablets.

So prepared, litmus contains several colouring matters; the chief of them appears to be a weak acid, which forms blue salts, that existing in the ordinary litmus being the potassium salt.

It is as an indicator of acidity and alkalinity that litmus is principally of interest to the chemist, and although other more definite compounds have been introduced for that purpose, litmus is still by far the most universally used of these indicators, and possesses its own special advantages. It shews a well marked change of colour when passing from the acid to the alkaline state or vice versa; it possesses great stability; paper is readily dyed with it, and retains its colour without change for a length of time. Litmus is best prepared as follows:—Macerate one part of litmus (previously pulverised) in five parts of water for two days, filter, and wash the residue with three parts of water. The solution is heated to boiling, and dilute nitric acid is gradually added until all the carbonate is decomposed, and the solution acquires a permanent wine-red colour. The liquor must be preserved in a bottle which has a slit cut in the cork or some other device to admit air, as litmus solution deteriorates both in colour and odour in a closed vessel. Test papers are made from this by immersing a strip of white filter paper in the solution and drying. A drop of acid or potash solution will make the colour of the paper what it may be required. Good litmus paper should have a purple tint; acids then turn it red and alkalis blue. Blue paper is deficient in sensibility.

ANILINE BLACK is the subject of a German patent granted to Mommer and Co., of Barmen. They use albumen, caseine and glue, in con-