Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- [x] Coloured covers/ Couverture de couleur
- [ ] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [ ] Bound with other material/ Relié avec d'autres documents
- [ ] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- [ ] Coloured pages/ Pages de couleur
- [ ] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [x] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [x] Continuous pagination/ Pagination continue
- [ ] Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- [ ] Title page of issue/ Page de titre de la livraison
- [ ] Caption of issue/ Titre de départ de la livraison
- [ ] Masthead/ Générique (périodiques) de la livraison

- [ ] Additional comments:/ Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

| 10X | 12X | 14X | 16X | 18X | 20X | 22X | 24X | 26X | 28X | 30X | 32X |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | ✓ | | | |

# Canadian Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XVIII. TORONTO AND MONTREAL, OCTOBER, 1901. No. 10.

Canadian Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XVIII. TORONTO AND MONTREAL, OCTOBER, 1901. No. 10

**Canadian Journal of Fabrics**

A Journal devoted to Textile manufactures and the Dry Goods and kindred trades.

Subscription: Canada and United States, $1.00 per year. Great Britain, 5
Advertising rates on application.

Offices: 62 Church Street, Toronto, and the Fraser Building, Montreal.

E. B. BIGGAR { BIGGAR, SAMUEL & CO. PUBLISHERS } R. R. SAMUEL

TRAVELLING REPRESENTATIVE: A. W. SMITH.
PHILADELPHIA AGENT: H. E. BURNETTE, Cor. Fourth and Locust Sts.
BOSTON AGENT: F. F. GRANT, 5 Gayland St., Roxbury.
Toronto Telephone, Main 1392 | Montreal Telephone, Main 2589
**Business correspondence should be addressed to Montreal; but cuts, news items and editorial correspondence to Toronto; cuts from abroad should be sent by post wherever possible, not by express. Changes of advertisements should be in our hands not later than the 10th of each month to ensure insertion.**



**CONTENTS OF THIS NUMBER:**



## TECHNICAL EDUCATION IN THE COTTON TRADE.

Among the subjects which came before the recent New England Cotton Manufacturers' Convention, held at Niagara Falls, was the advantage of technical education in the cotton industry. In his address, the president, Charles R. Fish, of Dover, N.H., remarked that "the ideal cotton manufacturer of the future, and I may say of to-day, is one who not only understands the arts of spinning and of weaving the cotton fibre, but is also proficient, at least to some extent, in the different branches of engineering. He must understand excavation, foundation work, and construction of all kinds. He must be able to figure for himself the strength of materials. He must be able to estimate the power required, and the power consumed. He must know the water-wheel, the steam engine, and the application of gas, compressed air and electricity; and so it is that the cotton manufacturer must also be, in a way, a mechanical engineer, an electrical engineer, and I believe in most localities a knowledge of political engineering will not come amiss." Following up this line of thought, Mr. Fish advocated the fostering of technical and textile schools and colleges, and the encouragement of study and investigation along the lines indicated in the quotation.

The matter was not long in bearing fruit, for immediately Mr. Firth, of Boston, head of the Wm. Firth Company, and president of the American Moistening Co., addressed the following letter to Mr. Fish:

International Hotel, Niagara Falls, N.Y., Sept. 26th, 1901.

Dear Mr. Fish.—I was very much impressed with your address yesterday to the New England Cotton Manufacturers' Association, especially with that part of your address which referred to the technical education of our boys. America, now that she is in a position to largely supply her own wants, must look to other countries for an outlet for her surplus production, and to do this profitably must follow the advice and recommendation made by you. Knowing this, I beg to say as a mark of my appreciation for the encouragement, and as an expression of my thanks for the many kindnesses received from the members of the association, I should be pleased to purchase a scholarship in one of our textile schools and present the same to the association. The scholarship to be used for the benefit of the education of a son of a member or a late active member of the association. The use of the same to be in the hands of the Board of Government for the time being, details of which can be arranged later if my offer is accepted by the association. W. FIRTH.

The advantage of this technical education, in another line, was referred to in the September number of the Journal of Fabrics, where the number of trained chemists employed in the German chemical works was pointed out. Attention has also been recently called to it by Dr. J. G. Hodgins, of Toronto, in a review of an article by Prof. Starling in the June Century. Speaking of the multiplicity of State-aided universities in Germany, Prof. Starling refers to the thousands of young men who every year leave these universities, trained in scientific methods; trained also to distinguish between the true and false in science. This is the army with which Germany is conquering the world's markets. No

better example of the interaction of universities and industrial pursuits—of pure science and technology—could be given than that of the newly effected commercial synthesis of indigo. At the present moment, Germany is on the eve of the wholesale absorption of a great Anglo-Indian industry, that of indigo production, by the invention of a German firm of chemists. After many laborious years of research by Prof. Bacyer, of Munich, this German firm has succeeded in manufacturing indigo on a commercial scale, from naphthaline, which can be produced in enormous quantities, at a cheap rate. The result is, that this firm are prepared to supply indigo to the whole world at a price with which indigo planters cannot compete, and thus they have obtained possession of an industry of the annual value of three millions of pounds sterling.

Another industrial chance, which was lost to England, is thus mentioned by Prof. Starling: "It is noteworthy that Hofmann, years ago, when professor at the School of Mines, London, strongly urged the Government to institute and support chemical laboratories, so that we might retain in England the aniline dye industry, then being developed by Perkins. His advice, however, was unheeded; and the whole of this industry is now in the hands of Germany, to whom we send the waste products of our gas-works, in order to buy back, at a large price, the aniline dyes, manufactured from these same waste products."

Dr. Hodgins calls attention to the fact that Canada has, at Glasgow and Buffalo, impressed the world with the great variety and value of its mineral and other natural products. These exhibits suggest great industrial possibilities for Canada. We must not allow the United States, England, or even Germany, to take away from us trade which we can control equally well, if we go about it in the right way, and the advantages arising from the development of our vast resources can be largely retained by giving due attention to technical education for our young men. Have we any W. Firths to encourage them?

## THE WOOLEN TARIFF.

The letter of Jonathan Ellis, the Port Dover knit goods manufacturer, quoted elsewhere, has been followed by a letter, reproduced in this issue, by T. A. Russell, secretary of the Canadian Manufacturers' Association. The Toronto Globe has been fair enough to print these letters, and it is to be hoped that their appearance in this medium will help to arouse the Government to a sense of the peculiar injustice done to the woolen industry by the preferential tariff, as it now stands. What is said in these letters has been said more than once in the Canadian Journal of Fabrics, in the past year or two, but as Mr. Russell brings some instructive figures down to date, our arguments are well reinforced.

Of all branches of the textile industry, the woolen branch, as we have said, is hit with particular force, and stands pitted against the best equipped of all of Britain's industrial armies—the only one, it may be said, that so far has stood the shock of the world's competition. The Canadian mills have also to stand against the smuggling that goes on from Germany to Canada, via England, under the shelter of the preferential tariff. It is rather a coincidence that we have had within the past few days the testimony of a British woolen manufacturer in condemnation of the Government's folly in this business. C. J. Alexander, ex-president of the South of Scotland Chambers of Commerce —a district representing the bulk of the Scotch tweed trade—spoke the other day, before the woolen section of the Canadian Manufactures' Association, dwelling upon the unwisdom of the policy of the Dominion Government in discouraging the woolen business. Mr. Alexander instituted comparisons between Canada and the United States, showing that while this country imported $10,000,000 worth of woolen goods last year, the imports of the United States only amounted to $14,000,000. This was due to the fact that the United States grants a much larger measure of protection to the woolen manufacturers than Canada. Mr. Alexander was of the opinion that the tariff on woolens should be materially increased in this country, until such a time as the industry becomes firmly established. He stated that while he was a free trader, so far as Great Britain was concerned, he believed that what Canada required was a true national policy." This, coming from the representative of the tweed district of Scotland, and from a man who has been for years familiar with the conditions of trade in the United States and Canada, as well as in his own country, should not be lost upon our people and Government.

—Reference was made in our September number to the large amount of electrical power applied to the cotton manufacturing industry in Canada. Mention was made of the Dominion Cotton Manfg. Co.'s Hochelaga mills, and to the Imperial Cotton Mills, of Hamilton, a description of the former having appeared in our August issue. Our readers interested in this development will not forget the large electrical installation of the Montreal Cotton Co., at Valleyfield, which was described and illustrated two or three years ago in this paper. The Montreal Cotton Co. has 3,600 electrical horse-power, which is probably the largest installation of any textile mill in the world, owned and applied to its own work exclusively. The company has four generators of 600 h.p. each, and one of 1,200 h.p., with 45 motors in various parts of the mills, ranging from motors of 30 h.p. up to those of 200 h.p. Taken altogether, we do not know of any country in the world that has applied electrical power to cotton manufacturing to the extent Canada has done.

—Cotton thrives in the coast districts of Natal and Zululand, and after the war, will no doubt be one of the promising crops of that part of South Africa. It should be an object to extend the area of cotton cultivation as much as possible within the British Empire as a provision against a recurrence of a cotton famine should war occur with another nation. In this connection, the Toronto Globe reprints from its issue of September 13th, 1851, the following letter from a Canadian settler in Natal, who had then been in that colony three years: "I shall dismiss this subject by a few remarks upon cotton growing here. This article will and does grow, and vigorously too in this country, as may be seen on plantations on the banks of the river Umgance (Umgani), no one thinking it worth while to pick it. But the instability of labor operates against its being cultivated to any extent. I am personally acquainted with the farmers of these plantations, who state that in addition to their inability to get the requisite amount of steady cheap labor, they had to sell their cotton for from ¾d. to 1d. per lb., to persons living there."

—Some industries suffer depression through caprice of fashion, as is the case with ribbons. This cannot be said of silks, for although the British silk trade is not prospering, silks in some form or other are, and will continue to be, worn. The depression can be removed, and according to the Draper's Record, one of the ways was stated by a well-known Macclesfield manufacturer in a recent interview. He is running his mill at a handsome profit, and while other manufacturers are not enjoying the best of times, he is most optimistic. "What has dragged Macclesfield and its people down," he affirmed, "is the fact of the raw material being so expensive, and that some manufacturers have made to stock, and then allowed buyers to come in and secure goods at ruinous prices. Macclesfield, as a silk centre, is undoubtedly in a bad way," he adds, "but if it were more enterprising, if all the manufacturers would work together, if there were more unanimity and less cutting down of prices, the town would hold its own." There is a great deal of truth in this opinion.

—Capital, from Calcutta, deplores the unsatisfactory opening of the jute season of 1901—02, that is, the unsatisfactory state of affairs for the Calcutta shipper and baler, who are threatened with a revolution in the conditions of their business. New contracts have been introduced by the jute associations of London and Dundee, which Capital justifies, on account of the deterioration of native baled jute standards. This deterioration it attributes to the following causes: (1) The mania for cheapness to which the Dundee spinner has been peculiarly subject. (2) The practice of dealing in groups of marks. (3) The practice among brokers and other owners of established marks of leasing out a mark to one or more balers. (4) The prohibition of examination alongside export vessel. (5) The abrogation in 1897 of the rule limiting sales of baled jute in the local markets to a delivery period of six weeks from day of contract. (6) The mania for forward speculative selling in which so many shippers and balers indulge. The inferior crop of last year has expedited the crisis, and now the British jute associations stipulate for a guarantee, which the shipper thinks might have been avoided, and which will be resisted by the trade. Reforms will, however, be made. All dealings in groups of marks and in any marks baled by more than one baler, will be prohibited. Shippers will also be more careful from whom they buy, and stricter in their inspection of the jute they ship. In the meantime, direct business with the continent has been stimulated, as spinners there are still willing to buy on the old contract, and a fairly considerable business, which would otherwise have been transacted through the medium of London dealers, is now being done past them.

—Australia is one of the great sources of supply for the wool consumed by the manufacturers of woolen goods, but it is interesting to know that the production of wool in that, and the other Australasian colonies, is decreasing, if the figures can be relied on. According to a table, issued by Dalgety & Co., in their annual review of the market, the export of wool from the colonies during the past year shows an increase of 9,923 bales over the previous year, but a decrease from former years. For the purposes of comparison it will be interesting to give the figures for the last three years:

| | 1900-1 | 1899-1900 | 1898-9 |
|---|---|---|---|
| | Bales | Bales | Bales |
| Australia..... .... .... | 1,216,169 | 1,197,181 | 1,278,630 |
| New Zealand.... .... .... | 388,218 | 397 283 | 385,887 |
| Australasia..... .... .... | 1,604,387 | 1,594,464 | 1,664,517 |

These totals compare with 1,718,720 bales in 1897—98, 1,848,509 bales in 1896—97, 1,851,573 bales in 1895—96, 1,959,811 bales in 1894—95, and 1,898,618 bales in 1893—94. It will thus be seen that the output of wool for the twelve months just ended falls short by no less than 355,000 bales from the 1894—95 supply, and yet prices are to-day considerably below the average between July, 1895, and June, 1896. Not only has the production of merino wool declined in Australia of late years, through a succession of dry seasons, but it has declined also in South America and at the Cape. Bearing in mind that the population of wool-consuming countries is all the time referred to as steadily increasing, the position of fine wools would at the present time seem to be anomalous. It is hardly probable that the existing low level of values will continue much longer.

The Waterloo Woolen Co., Ltd., of Ontario, has surrendered its charter, the date for such surrender being fixed by proclamation for Oct. 1st.

## SHUTTLES.

The shuttle is approximately boat shaped, or it may be called an elongated parallelopiped, hollowed out, the ends of which are tapered and fitted with points or tips. The hollow or opening in the shuttle serves to hold the weft pirn. In weaving, the shuttle serves to protect the weft and facilitate its drawing off. It is made either of wood or iron. The kinds of wood used are hornbeam, gervise, olive, apple, and especially boxwood. Lately, shuttles made of compressed wood have also come into use. Their manufacture requires great care so as not to split the wood at the ends, where the steel tips are fixed.

The weft is drawn off by the propulsion of the shuttle. If P is the weight of the shuttle, $p$ the weight of the cop or spool it contains, $v$ its velocity, and $g$ the acceleration of gravity, the inertia energy will be—

$$\frac{(P+p)\,v^2}{2g}$$

As the weight of the cop varies at each pick, the speed acquired by the shuttle under the blow from the picker will likewise vary, and in consequence the tension the weft threads receive is not regular. From the formula it follows that the construction of the shuttle should vary according to the fineness of the tissue—that is to say, the coarser the weft, the greater will be the effort required to draw it off, and the heavier the shuttle must be. In other words the weight of the shuttle must be proportional to the thickness of the weft, or in inverse ratio to its number.

The shuttles for hand-looms are generally lighter than those for power-looms, and are sometimes of curved shape. According to their being thrown by hand or by means of a picking motion their construction differs a little. All shuttles in this section may be further divided—according to the manner in which the weft is drawn off—into winding-off, drawing off, or into spool and pirn or cop shuttles.

Fig. 1 shows a shuttle of the first kind. The weft bobbin, being wound in cylindrical, rhomboidal, or oval form upon a spool, is placed upon a spindle C. In R there is a helical spring which allows of the insertion of the spindle into the holes. The thread supplied by the bobbin by winding off passes through an eyelet O of porcelain, glass, metal, etc. In working any sort of shuttle, the eyelet O must be turned towards the cloth side, so as to draw off the yarn without effort and to prevent its being worn by the reed. The shuttle shown by Fig. 1 is intended for throwing by hand, and the ends A are deflected so as not to catch against the dents of the reed. In certain cases of weaving from spools, the tension of the weft is increased, especially with silk spools. This resistance to the winding-off is effected in two different ways: (1) By pressure of the spindle; and (2) by pressure of a plate against the bobbin.

The pressure of the spindle is exercised upon the interior of the spool by means of bent springs. This way of producing frictional resistance is irregular, and depends upon the position of the bobbin while being wound off. The other system of pressure is applied by means of a plate arranged in the bottom of the shuttle, which is pressed against the bobbin by means of a spring. The tension obtained by this means is more regular than that upon the interior of the spool.

Fig. 2 represents a shuttle for pirns. This way of drawing off is still called in France "a la Carribary," after the inventor's name. As the pirn remains stationary, the thread is drawn off over the end and in the direction of the axis of the pirn. The tension is obtained by various bendings of the thread. As the drawing-off takes place in a direction almost perpendicular to the direction of the weft thread on the pirn, it will be easily understood that the slightest roughness in the pirn or its winding causes an additional tension on the weft, which sometimes reaches to the breaking strain. Shuttles for pirns or cops are now generally used for single welt, those with spools being employed for double weft yarns. After all, the regularity of the tension during the drawing-off is never absolutely equal, as the weft comes off more or less easily according to the thickness of the cop. In these pirn shuttles the weft, before passing through the eyelet, is taken over a hook. The shuttle, Fig. 2, is provided with rollers to facilitate the throwing. All shuttles of this kind are called fly-shuttles. The one in Fig. 2 is also provided with a crescent-shaped conductor for laying the weft more parallel to the cloth, and at as short a distance as possible. These shuttles with conductors are only employed in silk weaving.

In weaving by power, pirn or cop shuttles are used, and they may be classified according as the weft is wound in pirn, tube, or cop form. These shuttles do not differ in shape, but only in the arrangement of the recess or hollow of the shuttle. All shuttles for power weaving are either right or left, according to the arrangement of the eyelet at the right or left hand. This is of importance in looms with weft stop motions, for on account of the motion being arranged on the driving side, the shuttle when in the corresponding box must have its eyelet close to the weft fork.

Pirn Shuttles.—Fig. 3 represents a shuttle used in weaving worsted, shown in plan. The spindle is covered with wood, and can be turned round the pin A, Fig. 4 (vertical section), A flat spring B prevents this occurring of itself. To prevent the rubbing of the weft against the cheeks of the shuttle-box, there is on the side of the eyelet a groove in the side of the shuttle. When the tension is to be increased, the weft, before passing through the eyelet, is led over a piece of cloth glued to the shuttle, or belted to a tuft of threads fixed in the shuttle. It will be noted that the shuttles for power-looms are more tapered than those used for hand weaving, whereby they are better enabled to clear the shed when it is not sufficiently opened. The spindle, Fig. 5, greatly facilitates the fixing of the cop. This spindle is formed by a conical tube of tinplate, round which a brass wire is soldered in spiral form This wire forming a screw, it is easy to put the cop on to the bottom by slightly turning it. The thread is drawn through the eyelet by suction, the weaver holding the shuttle to the mouth. Many weavers, however, use a small hook. There is also a small air pump, which, fixed on the breast beam, can perform this operation rapidly and without danger to health. The shuttles for the Northrop loom have no eyelet, or rather the latter is replaced by a helical slit, permitting a self-acting introduction of the thread. Such shuttles should be recommended for all looms, for they are the means of saving both time and material in drawing through the weft, while relieving the weaver from sucking. (This rather injurious operation is performed about 100,000 times yearly by a weaver).

The spindle of shuttles for cotton differs slightly from the preceding ones. As Fig. 6 shows, it carries a flat spring for holding the tube of the cop. Fig. 7 shows a modification of this system. The spindle when turned into the shuttle, occupies the position shown on the drawing—that is to say, it rests against the pin A. When it is turned upwards, the flat spring D encounters a wire B which presses it back, when the cop tube can be removed without effort. Shuttles for cotton

generally have two or three eyelets, in order to impart more tension to the weft. The latter is drawn off at the upper part of the shuttle, so as to prevent its being spotted or dirtied by the cheeks or bottom of the shuttlebox.

Shuttles for silk must contain some kind of tension or check mechanism to prevent the weft running out too freely. The types of these devices are numerous, one of the most approved being shown in Fig. 8, and consisting of a small lever L, which is continuously acted upon by the spring S, and carries a number of rings arranged opposite to other rings fixed on the interior wall of the shuttle. The weft thread, being passed through these rings, is exposed to sufficient tension to prevent slackness. When the weft is wound on a wooden bobbin or pirn (Fig. 9), the latter is held in place on a fixed short tongue by a flat spring R, which engages in a recess cut round the base, as shown in Fig. 10. In the Northrop loom the internal tongue is dispensed with in order to facilitate the rapid ejection of the cops, these being held by two flat springs, like R in the figure last referred to.

Shuttles with Anti-vibration Tongues.—The object of these anti-vibration tongues in shuttles is to prevent the coils of weft slipping out of place over the nose of the cop, since when this occurs the cop is wasted. There are two causes tending to produce this slipping; improper setting of the cop on the tongue, owing to the weaver turning the bobbin the wrong way round, and the force of inertia when the shuttle is suddenly picked or stopped, the result being to throw the windings of larger diameter (A, Fig. 11) forward on to the tapering end B of the cop, the shuttle being supposed as moving in the direction shown by the arrow. During the return throw of the shuttle the force of inertia is without any appreciable influence on the cop; in other words the cop has a tendency to strip on reaching the box on the opposite side from the driving gear. In order to nullify the effect of inertia, various inventors have introduced tongues capable of slight longitudinal displacement, the recoil being effected by means of a spring. It should, however, be observed that this movement is of utility in one direction merely; the tongue may be drawn out, but not pushed towards the rear. The idea of this device is quite twenty years old, but has only been developed in practice within the last six years.

One of the most recent forms is the Castelin shuttle. But several anti-vibration shuttles at present in use will now be described. Fig. 12 shows the Duhamel shuttle, wherein the tongue B is fixed, whilst the tinplate cone D, on which the cop is placed, is mounted on the coiled spring R, the latter being compressed between the fixed ring C on the tongue and the ring A which is fixed to the cone, but slides over the tongue. By this arrangement the stopping of the shuttle on arriving at the end of its throw causes the spring R to undergo compression in one direction, the recoil following by a movement of elongation in the opposite direction.

The Verschaeve shuttle is represented in Fig. 13. Here the tongue B is keyed on to the bolt A by the peg G. A coiled spring R, held between the head of the bolt A and the metal plate P, resists the longitudinal displacement of the tongue B in the direction from the base towards the point.

Fig. 14 shows the Boursier and Bondeau shuttle. The tongue B has a shank A containing a slot, into which is fitted a pin G which, while restricting the movement of the tongue, allows it to turn up when required to fit on or remove the cop bobbin. The elasticity of the tongue is obtained by means of the coiled spring R, held in place between the flat spring C (which rests in a notch in the shank A) and the stop D.

In the Soots' shuttle (Fig. 15) the tongue is fixed, so far as axial movement is concerned, whereas the tube T, which is able to slide on B, has a slot C containing a peg G, by means of which arrangement the sliding movement of T is restricted to the length of the slot C. A piece of india rubber tubing D is firmly tied on to the wooden rings E, F, of which E is fastened on to the tongue B, whilst the other is fixed on to T. Thus the displacement of the tongue is permitted by the elasticity of the rubber sleeve D. Numerous other cop or pirn shuttles exist, the foregoing having merely been cited as typical examples.

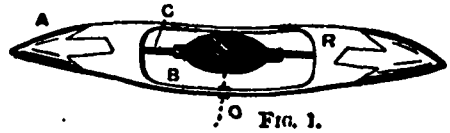


FIG. 1.

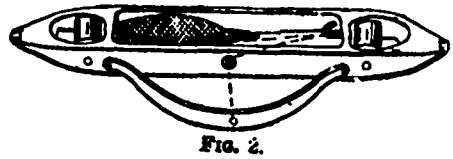
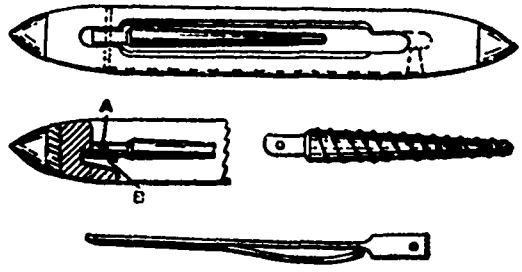


FIG. 2.



FIGS. 3, 4, 5 AND 6.

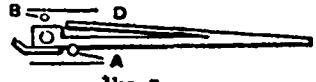


FIG. 7.

FIG. 8.

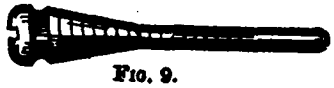


FIG. 9.

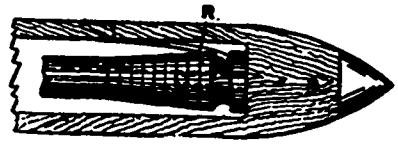


FIG. 10.

Ball Shuttles.—The use of balls or cocoons of yarn in place of cops is spreading in power-loom weaving, owing to the possibility of getting a greater length of thread into the shuttle at a time, and consequently reducing the loss of time consumed in refilling, etc. Besides, this system has been in use a long time in weaving low counts of carded wool, jute, hemp, etc., yarn. The cocoons may be unwound in two ways; outside from the point, and inside from the base. Each of these methods has its advocates and its particular type of shuttle.

Shuttle for Inside Unwinding.—This system of unwinding is chiefly applied to low counts of weft yarn. A typical shuttle is shown in Fig. 16. It is made of wood with steel ends, and encloses the ball in its central cavity, the inner

walls being fluted in order to increase the capacity and to prevent the ball slipping. The ball is merely inserted in the shuttle and kept inside by closing the hinged cover B, the

FIG. 11.

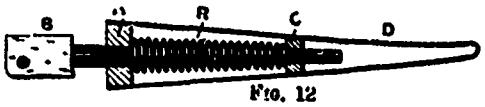


FIG. 12.

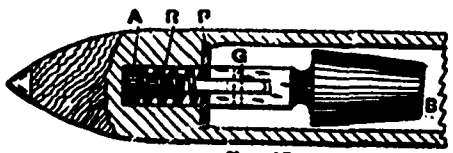


FIG. 13.

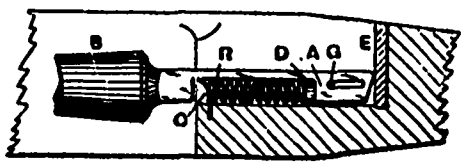


FIG. 14.

FIG. 15.

FIG. 16.

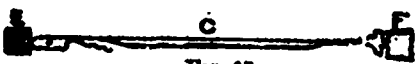


FIG. 17.

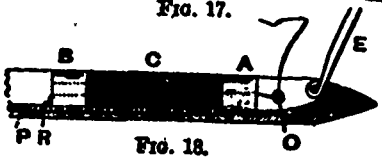


FIG. 18.

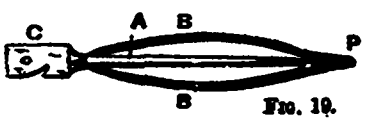


FIG. 19.

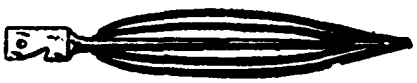


FIG. 20.


FIG. 21.

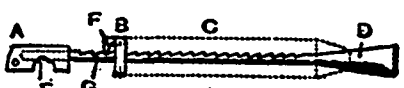


FIG. 22.


FIG. 23.

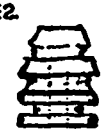


FIG. 24.

curved outer end of which engages with a hook C. In these shuttles the weft runs off through a porcelain eyelet, the tension being imparted by a pin or wad of wool, as in the preceding systems. In shuttles of this type for jute, hemp, etc., the cover B is provided with dents on its interior surface, these serving the same purpose as the flutings already mentioned. It will be also found that in large shuttles the hole in the cover through which the hinge pin passes is made oval in order to allow the cover a little longitudinal play.

The shuttle cover represented in Fig. 17 was invented by S. Davenport, and devised to prevent the splitting of the wood by the peg, the vibration of the cover being deadened by the insertion of india rubber washers E and F between it and the wood. It is advisable to provide one or two square peepholes in the shuttle cover to facilitate examination of the ball, especially for those used in jute or linen weaving, if no weft-fork stop motion is employed in these looms. Consequently, when peepholes are made it is easier to see how much weft still remains in the shuttle, and when the latter will need refilling.

Uniform tension of the weft is ensured by the Demarcq shuttle (Fig 18), wherein the ball is placed between two wooden washers A and B, the former being fixed, whereas B can be adjusted along the rack P, situated in the bottom of the shuttle, and is prevented from giving way by the engagement of the pawl R against the rack, though it may receive a forward displacement under the influence of inertia. The cover E encloses the movable washer and the cocoon, and the thread is run out through A and the eyelet O. This shuttle is suitable for weaving fine counts of linen, cotton, etc.

Shuttles for Outside Unwinding.—In all shuttles of this type the ball is slipped over a tongue, just as when the cop bobbins are employed. Fig. 19 shows the usual tongue for this purpose (A), made in one piece with the shoulder, C, and fitted with two steel springs B, which are soldered at P, but free at the opposite end; and their arched portion acts on the inner surface of the ball and holds it in position.

The Demarcq shuttle (Fig. 20) contains a double set of arched springs and is very efficient, since the application of pressure at any one point along the ball causes the springs to expand towards that point, and therefore prevents the displacement of the ball.

Serrated tongues, such as that shown in Fig. 21, are largely employed in linen weaving; they hold the ball in place by the fact that the teeth engage with the coils of the thread. Anti-vibration tongues have been recently applied to this type of shuttle, the use of the Verschaeve, Soots, Castelin, and other devices in shuttles of the kinds shown in Figs. 19 to 21 preventing much inconvenience due to stripping.

The Demarcq tongue (Fig. 22) ensures perfectly regular tension on the weft. This tongue may be raised at the base A for placing the ball in position, and, once lowered, the tongue is fixed by the slot E engaging with the peg. The lifting of the tongue at the base is entailed by the presence of the conical head D, against which the ball of weft abuts. A wooden washer B, slipped on the tongue after the ball of weft, is provided with a pawl F which engages with the teeth of the rack G, so that as the weft unwinds the force of inertia moves the washer B on towards the conical head D, and thus compresses the remaining weft. When the ball is unwound from the outside, there arrives a time when the running of the thread meets with opposition caused by the shape of the ball. To prevent this, the core pieces shown in Figs. 23 and 24 are employed as a foundation in building the ball.—L'Industrie Textile.

---

An attempt is being made in the United States to form a large combination of leather manufacturers with a capital of $80,000,000 or $100,000,000.

—The J. Stevens Arms & Tool Co., of Chicopee Falls, Mass., who have offered to distribute $500 in cash prizes among the 60 young people sending them the 60 best targets made with Stevens' rifles, have decided to extend their contest until Oct. 31st, as October is one of the best months in the year for shooting. Great enthusiasm is manifested among the young people of the country in this contest, and if you have not already entered, this is a good opportunity to try your marksmanship. Stevens rifles are acknowledged superior to all other makes."

## MR. RUSSELL'S LETTER ON THE WOOLEN INDUSTRY.

To the Editor of The Globe,—In your issue of Thursday, Sept. 19, there appeared a note stating that the imports of woolen goods for the year ending June 30, 1901, amounted to only $9,944,805, as against $9,801,565; that this was an increase of only 1 per cent. over the previous year's imports, and therefore the statements of the woolen manufacturers to the Government were groundless. A subsequent editorial in The Toronto Star makes use of the same figures to show that the preferential tariff has not hurt the woolen industry.

Permit me briefly to present the actual facts with reference to the preferential tariff and the woolen industry. In the first place, the figures given in The Globe included for both years items which are not properly classed as woolen goods, but are really articles made from woolens. These are shirts, blouses and shirt waists and ready-made clothing. The actual figures, then, for the imports of woolen goods since the operation of the preferential tariff are as follows:

| | |
|---|---|
| In 1897 | $6,295,057 |
| In 1898 | 7,232,250 |
| In 1899 | 8,656,790 |
| In 1900 | 8,765,663 |
| In 1901 | 8,965,360 |

In other words, the increase in the importation of woolen goods in the four years while the preferential tariff has been in force has been $2,670,303. When this was placed before the Government last session one of the Ministers pointed out that the large increase in the population, which will be shown by the census, would account for this increase in the importation of woolen goods. I judge that this statement, however, will not be made now. A more reliable explanation is obtained by a comparison of the textile directories of the years 1895, 1899 and 1901, which show that machinery capable of making $2,750,000 worth of woolen goods has ceased to operate in Canada during that time. How much this means to the industry in Canada may be obtained from an accurate calculation made last year, which placed the total production of Canadian woolen mills in 1896 at $9,750,000, and last year at $7,000,000. In other words, nearly 30 per cent. of the present trade of the Canadian woolen mills has been displaced during the past four years by imported goods.

The second argument that the increase in the preference from 25 to 33⅓ per cent. (as reflected in the imports for the years ending June 30, 1900, and June 30, 1901, respectively) has led to a very small increase in the importation of woolen goods, is entirely misleading, on account of the difference in values for the goods during these two years. The prices for all classes of woolens have depreciated fully 15 per cent., and despite this the importation of woolen goods in dollars has increased practically some $200,000. This is shown by the Government statistics of imports by yards and pounds. Table "A" gives the imports of those articles measured in yards in the customs returns for the two years 1900 and 1901:

Table "A."—

| | 1900. Yards. | 1901. Yards. |
|---|---|---|
| Cassimers, doeskins, cloths, tweeds | 3,932,032 | 5,012,693 |
| Coatings and overcoatings | 989,364 | 1,065,342 |
| Felt, cloth and horse collar cloth | 33,995 | 62,735 |
| Flannels | 542,522 | 731,527 |
| Carpets | 2,376,476 | 2,153,860 |
| Total | 7,874,389 | 9,026,157 |

The imports of the goods included in the above table account for by far the greatest part of the total woolen business. The increase in the imports of these for 1901 as above the year 1900 was 14.6 per cent., and amounted to 1,151,769 yards. Table "B" gives the imports of woolen goods that are measured by pounds in the customs returns:

Table "B."—

| | 1900. Lbs. | 1901. Lbs. |
|---|---|---|
| Blankets | 108,057 | 92,500 |
| Yarns | 855,507 | 909,654 |
| Felt | 432,748 | 490,038 |
| Shoddy | 78,842 | 43,677 |
| Total | 1,475,154 | 1,535,869 |

The rate of increase in this class for the imports of 1901 over the year 1900 was 3.9. Further than this, it is an indisputable fact, although figures can hardly be brought forward as proof, that in a desperate attempt to hold their trade during the last year the Canadian woolen men cut their prices to an extent that has caused them to run at too low a margin of profit, and in many cases at a loss. I have further verified what is thus absolutely proven by the Government returns, that the imports have largely increased in amount, although the value remained the same, by obtaining the opinions of prominent wholesalers in the city.

Mr. W. R. Brock said as follows: "I am positively convinced that prices in woolens, worsteds, knit goods and all classes of woolen goods were 15 per cent. lower for the year ending June 30, 1901, than for the preceding year."

Mr. J. W. Wood, of Gordon, McKay & Co., stated: "I am quite positive that the decrease in prices for the two fiscal years you have referred to is at least 15 per cent. and in many lines the decrease in price is even greater."

Mr. J. O'Hara, woolen buyer for Gordon, McKay & Co., stated that in many lines the decrease was as much as 25 to 30 per cent., but that 15 per cent. of a decrease in prices was well within the mark.

Hence the following facts are indisputable:

1st—The woolen imports have increased in value during the four years of the preferential tariff about $2,670,303.

2nd—Woolen machinery capable of producing $2,750,000 worth of woolen goods has ceased to operate, and has thrown a corresponding number of men out of employment.

3rd—The imports of woolen goods increased 14½ per cent. in 1901 over the year 1900, as the result of the increase in the preferential tariff from 25 to 33⅓ per cent.

The woolen manufacturers, Mr. Editor, have no desire to parade the difficulties of their situation before the public or for the scrutiny of their keen foreign competitors. Surely it is not necessary for this industry to show that the whole of its trade is being swept away in order that they receive just consideration at the hands of the Government of the country.

I have not endeavored to outline in detail the situation of

the woolen industry, but only to correct the impression which undoubtedly was conveyed in the above mentioned article that the woolen manufacturers' complaints were shown by the Government returns to be groundless.

T. A. RUSSELL,
Secretary, Canadian Manufacturers' Association.
Toronto, Sept. 30.

## Foreign Textile Centres

Manchester.—Warmer shawls, light furs and other materials of like character indicate that the season for lighter goods has passed, and that winter is approaching. The season for summer fabrics, just ended, has been fairly good. There have been many ups and downs, ebbs and flows, and many specially trying periods, but taking the spring and summer generally, the statement will hold good. The two sewing cotton combinations have reduced the price of the reels used by wholesale clothiers, the drop in some cases being as much as 17½ per cent., but those usually sold by drapers have not been reduced in equal proportion—not over 7½ per cent. on the average. Continental quotations of sewings used by clothiers are now slightly above those of British makes. There seems no reason why this should not always be the case, seeing that in cotton spinning Britain is supposed to occupy the lead amongst the world's producers. A good deal has been said of late regarding linen underwear. Woolen, as a garment next to the skin, is said to felt, and consequently prove unhealthy, defects from which the flax article is said to be free. Although a good deal has been said in favor of linen mesh and other descriptions of underwear, the sales have not increased extensively, woolen materials still having the largest run. Father Kneipp's crusade of a few years ago had some effect at the time, but the virtues of linen underwear have of late been almost forgotten. Its advocates are, however, beginning to push their ideas again, and should their argument impress the public the sales of linen goods must be stimulated. The linen market is at present very quiet, and buyers seem indisposed to pay the prices asked by manufacturers, although it seems impossible to reduce quotations in view of the prices that have to be paid for raw material. Prices have been maintained at a higher level than would otherwise have been the case by the extensive placing of Government orders.

Dundee.—With the exception of an enquiry by the Government about the price of new linens, business is quiet. Hessians seem to be the only kind of goods in which business can be done. Forty-two inch wide materials vary greatly in price, according to the time delivery is wanted. For fourteen days delivery 2d. to 2 1-16d. is the ruling rate. The Fife manufacturers are hoping for good things to come, as there are plenty of enquiries for the better class of household linens. Although they are keeping down the production of bleached damasks and towellings, it is with the idea of obtaining better prices, which have not been up to paying strength for some time past. A new industry is to be established at Dundee, viz., a linoleum factory. A large factory, under competent management, may be looked for. The final forecast of the new jute crop has been received. It states that the area cultivated is about 2,249,000 acres, and the outturn anticipated is 96 per cent. of normal crop. The news means that jute will be cheaper, and in all probability will beneficially influence trade generally.

Leeds.—The market here is comparatively apathetic. Orders for next spring have to a large extent been placed, and the winter trade is not such as to cause any speculation. The low rates prevailing of late have unquestionably affected to a serious extent the large number of mills engaged in the production of low woolens, and cotton has been and is still comparatively high. On the other hand, with wool low in value, it has been possible to place an all-wool fabric on the market at a price very little higher than that of union piece-goods. Under these conditions, consumers have naturally preferred the all-wool material, and hence the cotton-warp fabric has been almost neglected. A rise in wool would, therefore, afford relief to producers of low-class woolens. This branch of the industry is at present very depressed, and stocks in manufacturers' hands are large. Business in worsteds and superior woolens is consequently in a much more vigorous condition, though the demands from stock of almost every description are at present restricted. The export to the far East is improving, and one or two houses in this district are turning out large quantities of the low-class fabric known as Spanish stripes for the Chinese. The wholesale clothiers who ship to the colonies are also making larger consignments to South Africa than they have done since the war commenced.

Belfast.—The market is steady, but without quotable change. The death of President McKinley is expected to stop much expansion with the United States for a few weeks. Irish flax markets are now opening. The quality is good medium, with prices ranging from £52 to £70 per ton. Spinning branch quiet, but with a fair demand for tows, which producers are not inclined to sell further ahead at present. Warp lines are in increased demand. Manufacturing end steady, with moderate buying. Home markets continue to improve steadily, and prospects are better. Shipping trade keeps regular, and slightly improved with Canada and Continent; Cuba and Australia dull; South American demand quiet. The last Flax Supply Association circular, dealing with the Board of Trade returns, relating to the imports of flax and tow into, and the exports of yarn, thread, and linen piece-goods from the United Kingdom says the imports of flax and tow for August are decreased 50.5 per cent., and 38.3 per cent. in quantity and value respectively. Yarn imports exhibit an increase of 19.7 per cent. in quantity, and 3.6 per cent. in value. Yarn exports, on the other hand, are decreased 34.6 per cent. in quantity, and 22.6 per cent. in value. The exports of linen piece-goods show a nominal increase in quantity, and in value an increase of 9.5 per cent. These figures are based on a comparison for five years. Business in the brown cloth market keeps steady, and any change is in the direction of improvement. Power-loom linens for bleaching are in steady request. The improved demand for cloth for dyeing and hollands is well maintained, and there is also a growing demand for unions. A satisfactory business is passing in dress goods, and there is a further steady improvement in the demand for damasks and household linens. The handkerchief trade continues to show signs of more life.

Bradford.—The colonial wool sales are proceeding in London with spirit, and the prices established at the opening have been more than maintained. For the best kinds of merino the competition is very strong, both from European and American buyers, and it is probable that it is only the coolness of English buyers which has prevented still further advances being established in the price of the finest wools. The price of the best 60's merino tops has been forced up from 18½d. per lb. to 20½d., and both spinners and manufacturers are finding the greatest difficulty in obtaining anything like an equivalent advance for either yarns or piece goods. Although there is every reason to expect that this advance in the price of the best merino wool will be fully maintained for some time, the trade in all classes of fine wool textiles will continue in a much more healthy condition if time is given

for this advance to be established in all branches of the manufacturing trade before the prices of raw material go any further in an upward direction. The tendency of values in raw wools may, as a rule, be forecast by the probabilities of production, but recent events have shown that whatever the shrinkage in the production of pure merino wool may be, if prices are forced up beyond a certain point, the consumption rapidly decreases. We appear to be well below that point in values at present. The trend of fashion, both in men's wear and dress goods, is in the direction of the use of the finer classes of wool, and any change in favor of the use of coarser wools can only be introduced gradually. No doubt the prices of even the coarsest kinds of colonial crossbred wools are distinctly higher in London than was the case at the previous sale series. The values of these wools had fallen so unprecedentedly low that some reaction in an upward direction was almost certain to come about. No doubt these very low prices for crossbred wools have enabled users to produce manufactured goods at such extremely low prices that increased attention has been attracted to them, but a certain time must necessarily elapse before a movement of this kind has any marked effect on the market. In addition to the improved demand for crossbred wool yarns for the home market there is also more business for these yarns coming from the continental manufacturing districts. There is little change to report in connection with most kinds of home-grown wools, but the best pure lustre wool is still in very good demand, and there are some orders from the United States for both Irish wool and downs. As for piece goods the prices of the best qualities of mohair and alpaca are very firm, and there is a somewhat improved enquiry for the lower kinds of mohair. Although the trade in piece goods for the time being is not all that might be desired, there is quite an average business being done in plain dress goods for the winter season, especially in fabrics with a warm clothy handle and finish. Fine plain fabrics, with a bright lustrous appearance, are likely to be in demand for spring dress materials. Plain mohair seems to meet this requirement, though some firms are producing goods of silk and the finest merino, and one has introduced a new finish for fine soft wool goods, which it is claimed gives a bright silky appearance to the goods without detracting from the pliancy of the fabric. There is a good demand for silk and wool fancy delaines, both in plain shades and also in printed styles. Some of the latter, although somewhat daring in design, are extremely handsome.

Kidderminster.—The Textile Mercury reports nothing fresh in the carpet trade. The season has not fairly opened yet, especially in London, and though here and there firms are busy, the bulk of the looms are not fully occupied. There is nothing stirring in the yarn trade; some few enquiries are made for contracts. Prices, for carpet yarns, are still at an extraordinarily low level. No advance can be quoted, but for delivery next year spinners are careless about orders at present prices. The delivery of yarns, both woolen and worsted, is very slow.

Nottingham.—There is beginning to be a fair enquiry for lace and net yarns in the higher counts. The sales of ordinary cotton yarns are below the average. Merino and wool yarns are decidedly firmer in value, and buyers have been placing orders to a fair extent. Business in the fancy lace warehouses is slow, but indications in the fashionable world are favorable to lace, and there are buoyant anticipations of future improvement. There is a fair demand for millinery tulles. The market for torchons is overstocked and the production has had to be curtailed. Veilings do not sell quite so freely. In curtains, blinds, etc., there is no activity. In hosiery there is fair demand for natural wool and merino goods. The cotton branches are depressed. Silk hosiery is only in limited demand.

Leicester.—The hosiery industry is healthy. Specialties and fancy goods sell freely at firm prices. There is more business doing in the yarn market; enquiries are more numerous, and prices are stronger.

South of Scotland.—The South of Scotland woolen trade report a decided improvement in the Border district. Confirmations are coming in well, and the advance in wools of 5 to 10 per cent. at the London sales ought to make still further improvement. A quiet tone prevails in the Glasgow cotton yarn market. Spinners of American qualities are disposed to meet buyers, while Egyptian qualities are rather firmer Business, however, is of a limited character. Floorcloth and linoleum makers in Kirkcaldy continue quiet. There is no improvement in the linen trade, and there is not likely to be at present. The weather for September has been unusually mild, which has interfered with trade in autumn goods.

## OILING WOOL.

The operation of applying oil to wool, which is to be carded and spun, is a disagreeable operation to the operative if done by hand, and is attended with more or less waste of oil and a difficulty in securing a uniform distribution of it throughout the batch. It is not possible to dispense with oil, as dry wool spins badly, if indeed it can be spun at all. Manufacturers often seek to economize by either reducing the quantity or quality of the wool oil used, but generally such experiments are attended with failure. Any reduction of oil below what is necessary to properly lubricate the wool results in increased flyings and waste in the cardroom, and in causing the fibre to work badly in both rooms, causing imperfect yarn, decreased production, and inferior cloth, and any experiment in the way of reducing the quality of the oil is frequently attended with far more serious consequences.

The oil is applied to the wool for a temporary purpose only—namely, to facilitate the operation of carding and spinning. After these processes are completed, and the yarn has been converted into cloth ready for finishing, all the oil in the wool must, in nearly every textile fabric, be first removed before the goods are ready for the market. A few fabrics, such as certain woolen hosiery, it is customary to finish without scouring, and, consequently, with the oil in the goods. A cheaper and inferior oil generally means an oil difficult to saponify and remove from the fabric. Many of the difficulties which mills experience in getting their goods clean are the results of using inferior wool oils; but a good oil, when used on the wool, instead of making the cleansing of the goods difficult, facilitates that operation by combining with the alkali in the goods, and forming soap, which, being thoroughly incorporated in the fabric, is a very efficient agent in the cleansing process. So it may be laid down as an axiom in woolen manufacturing that nothing but the best oil should be used for oiling wool.

The application of the oil is, as stated, a disagreeable process, and improved methods of doing this work have been invented from time to time. The different methods which have been employed exhibit, perhaps, as clearly as any other process in the mill, the advance which has been made in the art of woolen manufacture. The old hand process is carried out as follows: Thin layers of the wool are spread on the floor, and a man sprinkles each layer with what he considers the proper amount of oil. Then, taking a pole 8 or 10 feet long in his hands, he proceeds to pound the wool, and, by a twist, which he gives the pole as it strikes the batch, turns the top of the layer, which had received the oil, down into the batch, which serves

to more thoroughly spread the oil throughout the stock. There is quite a knack in giving this twist to the pole, and a painstaking man can contribute much to the success of the carding and spinning operations by paying attention to this point; but as it requires considerable effort and strong arms, it is very liable, especially in the case of careless and indifferent workmen, to be slighted. After one layer has been oiled and shaken up, another is applied, and the same operation is repeated until the whole batch is oiled. The total amount of oil for the whole batch is measured out carefully, but the amount applied to each layer must of necessity be left to the judgment of the operative; consequently one portion of the batch may receive more or less than its proper share of oil. This variation is to a great extent remedied in the subsequent operation of picking, but frequently the carder notices that one part of the batch has more oil than the rest.

While wool oil facilitates carding and spinning, it is also true that the addition of water to some kinds of wool aids in these processes, and so it has been the practice to mix the oil with a small proportion of water, sometimes as much as three parts of water being used to one part of oil. The objection to this is that the water evaporates rapidly, and as this operation does not proceed in a uniform manner throughout the batch, it causes a great deal of trouble in the cardroom. When starting a new batch, which has been recently oiled, the wool will contain much more moisture and will card better than it will in a few days, when a part of the water has evaporated; and sometimes, especially if the batch is large, the last part of it to be carded will contain no moisture. This variation is a very serious matter, and causes uneven yarn and bad spinning.

To obviate these difficulties, a device has been invented for applying the oil as it is fed into the card. It consists of an oil tank placed above the first breaker feed apron and extending across the width of the apron. A revolving shaft is placed above this tank, and this shaft has three or four jointed arms, at the end of which a rod is passed. This arrangement is so made that when the shaft revolves it immerses this rod in the oil, and then brings it up slowly out of the liquid, and more or less of the liquid will adhere to it. As the rod revolves and passes the centre of gravity, it is so arranged that its weight will cause it to fall, and a stop is provided, so that when the rod strikes the stop the particles of wool adhering to it will be shaken down on the wool. When the shaft passes round it again causes this operation to be repeated, and the amount of oil can be partially regulated by the speed at which the shaft is run.

## MORDANTING WOOL.

Colors fast to milling may be produced on wool by the formation of lakes, and by this process the woolen goods are mordanted with chromium compounds, and subsequently boiled in a solution of the dyestuff. The chief feature of the mordanting process consists in impregnating the material to be mordanted with a boiling solution of potassium or sodium bichromate with certain assistants, which serve to decompose the bichromate and simultaneously to reduce the chromic acid thus formed. Suitable assistants are tartar, oxalic acid, lactic acid, or lignorosin in combination with sulphuric acid. Sulphuric acid alone, or boro-sulphuric acid, or certain other additions sometimes employed, set free the chromic acid without reducing it; hence the reduction can only take place by affecting the wool fibre. It has, however, been recently found by the Actien Gesellschaft fur Anilin Fabrikation of Berlin that by substituting for the above-mentioned assistants neutral ammonium salts—for instance, ammonium sulphate—a mordanting bath of most valuable properties is obtained.

The new mordanting bath, prepared from potassium bichromate and ammonium sulphate, is neutral at first, but becomes slowly acid when boiled, a part of the ammonium sulphate decomposing and ammonia being given off. The latter escapes or reduces the small quantities of chromic acid which at the same time have been set free; further, nitrogen, water, and lower oxides of chromium are formed, which latter immediately become fixed upon the wool fibre. It is evident that the mordant is slowly and evenly deposited on the fibre, and if a sufficient quantity of ammonium sulphate is added, the bath may be almost completely exhausted.

This new method permits the addition of a number of mordant coloring matters directly to the mordanting bath, without the formation of a lake occurring immediately in the bath. As the bath is neutral at first, the coloring matter is first absorbed by the wool. On boiling, the trace of chromic acid liberated is immediately taken up by the fibre, which possesses a very great affinity for it, and combines with the coloring matter upon the fibre. The reaction continues in the same manner, and is assisted by the dyebath becoming more and more acid, until both the coloring matter and the chromic acid are withdrawn from the bath and united upon the wool.

The following advantages are claimed for the new method: The dyeing process is carried out in one single operation, the goods being brought into the boiling bath, no subsequent addition of any ingredients being required. The bath is completely exhausted, so that several consecutive dyeing operations may be carried out in the same bath. Mere traces of chromium that may have been retained can be removed, if necessary, by the addition of a small quantity of lactic acid. The bath directly dyes those shades which in the older dyeing processes have only been obtained by a subsequent treatment with potassium bichromate. Consequently the dyer has it in his power to match directly. Since dyestuffs, as a rule, dye very evenly in a neutral bath, the dyeings obtained with the help of this mordanting process are more even in shade compared with those produced upon a chromium mordant. Whilst in the latter case the color lake is immediately formed upon the surface of the woolen fibre, thereby tending to yield uneven dyeings, by the new method the material is first thoroughly penetrated by the dyestuff, which is then gradually fixed during the boiling of the bath. By this means even very thick and closely-woven fabrics can be dyed through. Many coloring matters, when subjected to the new process, yield shades which are essentially richer and much faster to milling than those produced by the older ones. The preparation of the dyebath may be greatly facilitated by keeping standard solutions containing the dyestuff and all the necessary ingredients in the proportions required. Such standard solutions could be prepared by the color manufacturers and brought upon the market.

The following are three samples of the method of conducting the new process: (1) Dissolve in boiling water 1 lb. of potassium bichromate, 1 lb. of ammonium sulphate, and 1 lb. of anthracene red in a vat of 200 gallons. Introduce 100 lbs. of slubbing, and connect with a pump. Work for two hours until the bath is exhausted. Rinse and dry. (2) Dissolve in boiling water 1 lb. of Chrome Fast Yellow R, 1 lb. of potassium bichromate, and 1 lb. of ammonium sulphate in a vat of 300 gallons. Introduce 50 lbs. of worsted yarn at a moderate temperature, lift six times, raise the temperature slowly to boiling, and dye, gently boiling until the bath is exhausted. (3) Dissolve in boiling water 7.5 lbs. of the azo-dyestuff paste obtained from diazotized picramic acid and meta tolylenediamine, 1.5 lb. of potassium bichromate, and 1.5 lb. of ammonium sulphate in a piece vat of 200 gallons. Introduce 75 lbs. of worsted goods at a moderate temperature and work

for fifteen minutes. Raise the temperature slowly to boiling, and dye while boiling until the bath is exhausted.—Textile Manufacturer.

## FULLING HEAVY WOOLENS.

In the fulling of all woolen textiles, there are certain conditions which have the effect to a greater or less degree of retarding the process, and of keeping it from bringing about the desired results in the quickest time possible, and with the least expense as to labor and time, and the value and wearing qualities of the material. A soap that is not right in its constituents, or in its make-up, or is not applied correctly or at the right time, or cloths that are not correctly prepared for the process, or are peculiar in some measure as to the stock of which they are made, or the conditions in which they are brought to the mill, are some of these conditions which will lead to the retarding of the process. It is especially in connection with the latter that we wish to deal in the present article.

Heavy goods, and goods that are thickly woven, and such as carry in their body a considerable amount of grease and dirt and natural materials, will always be found to full with great difficulty; and something special must be done in order to counteract these conditions, and make the process such that in its action upon the textile it will increase its value rather than diminish it. One of the things which is constantly done in order to help the fulling process in working on these kinds of cloths is to wash the goods previous to their being put in the mill. This washing does not necessarily have to be very thorough, nothing like, in fact, that which succeeds the fulling, but it has to be sufficiently vigorous to loosen up the foreign materials in the fabric, and give the fibres an opportunity to come in contact with the soap, and to get all the benefit which is to be derived from friction and heat, which are the working elements in the process. It may seem as though this washing were unnecessary, and simply an added expense, but experiment undoubtedly will testify to the fact that in most cases it is a distinct advantage.

In order to show the actual facts of the case, if a quantity of pure wool is taken and washed before it is fulled, it will lose about 5 per cent. of weight, as compared with wool that has not been washed. The explanation of this loss is probably the fact that a larger amount of dirt and grease has been removed; if a quantity of pure wool is taken and fulled without washing, it will be found that it will be much more difficult to cleanse it afterward, and this would seem to indicate that the removal of the foreign materials, previous to the fulling, is a distinct help, so far as the strength and quality of the wool fibre is concerned. A woolen not washed until after fulling will yield two or three times as much of the foreign material as goods that are washed previous to fulling.

It might be thought that the washing before fulling would make the fulling operation shorter, so far as time is concerned; but the fact of the matter is, that the time consumed is about the same. While this, however, is true, the distinct advantage comes in, not in the question of time, but in the question of the appearance of goods, together with their handle or feel. The colors and shades always show up better where the goods have been previously washed, and the whole appearance of the fabric is so superior that while perhaps expense has been incurred, and the time of operation has not been shortened, nevertheless, taking it all in all, the additional process has easily paid its way.

In fulling, one of the things that we have to look after is the crowding up of the goods to the required limit. It is noted in connection with this previous washing that it distinctly aids in this particular in some cases. We have observed that where carbonized wools of low grades are employed, it is sometimes very hard to get them up to the point desired unless they are previously washed. In working on this description of fabrics, it is almost fatal to attempt to force the operation, since it cannot be done without detriment to the life and strength of the goods. If goods of this description are treated with benzine, they will always give up a certain amount of grease and fat, and this seems to indicate that soap is present; or, in other words, the goods are not properly washed. The only way to be sure of a clean fabric under these conditions is to wash before fulling. There is a considerable difference in the amount of time required for fulling these goods when they are washed previously, and when they are not. If they have been thoroughly washed for three or four hours with a good supply of soda alkali, the time will be reduced nearly 30 per cent. This is true, it must be remembered, with the low-grade stocks of which we have been speaking. If shoddy is used in these low-grade woolens, to any liberal extent, the washing before fulling will in many instances give the fabric the appearance of woolen cloth, and pretty nearly cover up entirely the presence of the adulterant; but the shoddy has got to be in right condition, and if it is carbonized, as it usually is, it must be washed free of sulphuric acid. If you boil the woolen in water, and find that it gives an acid reaction, you may know that it is not free of the acid, and will not work to the best advantage. Where this free acid is present, and the goods are brought in contact with a soda alkali, the tendency is for the formation of a new kind of a material upon the surface of the fibres. This material will act injuriously in connection with the fulling, since it is insoluble in water unless the water is considerably heated.

Some may say, perhaps, that washing keeps the goods from fulling up to the right width and length, and indeed this may be the experience under certain conditions; but we may rest assured that where it does occur, the fault does not consist in the fact that the operation has been undergone, but that it has been improperly manipulated. If the washing, previous to fulling, has been thoroughly done, and the fibres left perfectly free to be acted upon by the fulling elements, without at the same time having their natural properties impaired or destroyed, the fulling process simply cannot help but be expedited thereby. If, however, it is impossible to get the goods quite up to the point, this is somewhat atoned for by the very much superior appearance and feel of the fabric in question.—Textile, in American Wool and Cotton Reporter.

## WOOL DRYING.

By Ernest B. Fry, Head Master, Textile Department, Keighley Technical Institute; in Textile Recorder.

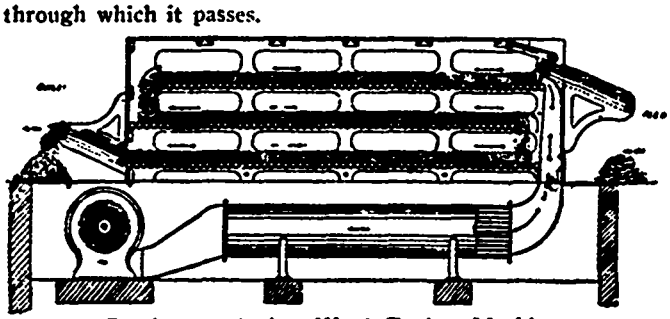
The next operation to that of washing is the partial or complete drying of the wool, in readiness for the following processes. The press rollers of the last washing bowl generally leave the wool too damp to work well in the machine, except where the squeeze is an exceptionally heavy one, and where the wool is of such a character that it does not require properly drying. The degree of dryness required is determined by the nature of the wool and the processes through which it must pass.

The shortest and finest wools are generally carded—that is passed through a carding engine for the purpose of opening out the locks or staples and separating the fibres; and, as there is a great tendency in this process for the fibres to fly off the cylinders as they revolve (producing waste, technically known as "fly"), the material is dealt with in the damp state.

just as it comes from the washing bowls, and by this means the wool works better and the "fly" is much reduced in quantity; and, as the greater portion of this class of wool is re-washed or "backwashed" immediately after the carding (to get a better color), it would be a waste of time and labor to dry it after the ordinary washing and before the carding, when it has to be wetted again after this latter operation, especially as the dampness of the wool assists the backwashing by allowing the suds in the machine to penetrate the slivers of wool more readily.

Long wools are usually opened out by passing through the gilling or preparing machines, and they must be in a much drier condition than for the carding process; and it is, therefore, necessary to have some means of removing the surplus moisture from the fibres. Various machines have been invented with this object, and, as with the washing machine, great strides have been made in the last ten or fifteen years in the improvement of the drying processes.

It has previously been stated that wool is extremely hygroscopic—that is, it absorbs water readily, and contains a considerable quantity of it (16 per cent.) in its natural state—and care should be exercised in the drying process that no part of the wool is made too dry, as it then becomes harsh and brittle, and does not work easily; and it should be borne in mind that the wool is better too wet than too dry, for the temperature of the rooms in the factories is generally so high that the wool dries in considerably during the processes through which it passes.



Continuous Action Wool Drying Machine.

The oldest type of drying machine in present day use consists of a long table or box, with the top sloping downwards slightly towards each edge from a ridge in the middle, and this top is entirely covered with coarse wire netting, underneath which a series of pipes are placed, which can be heated up to any required degree by steam. At one end of the drying table a powerful fan blows air into the space under the netting, and this air, after becoming heated by circulating round the steam pipes, is forced up through the wet wool, which is placed on the wire netting as evenly as possible by hand. The only way out for the heated air is through the wire netting and the wool, and in its passage through the latter it takes up the moisture gradually, until the whole of the material is sufficiently dry to remove, and then a fresh supply of the wet wool replaces it.

This method of wool-drying possesses a considerable number of disadvantages, whilst practically its only advantage is cheapness: even this is doubtful economy, and it is rapidly giving place to more modern and better methods of drying. The principal disadvantages are that it is slow, that manual labor is required to bring the wool from the washing machines and to take it away when dry to the next process, and that it requires constant attention during the drying operation to keep the wool evenly spread over the wire netting; for the pressure of air underneath is constantly lifting the wool, and as the air will always pass out through the points of least resistance, or in other words the thinnest places, the rush of air through a thin place lifts the wool up and blows it aside, making a hole through which the heated air escapes, without helping in the drying operations, and the thin places become over-dried and scorched, whereas the thick places hardly get dried at all, thus producing a very great irregularity in the work. Again, all the vapor from the wool and the heated air are blown out into the drying room, to the great inconvenience and discomfort of the workers, and in many cases without any attempt at efficient ventilation.

In another form of table drier the steam pipes are placed in coils above the wire netting and wool, and the fan is used to draw air out from under the drying table, and therefore down through the wool after being heated by the pipes. This process has the commendable advantage that the whole of the vapor and hot air is drawn down into the fan and discharged into the open air, to the great benefit of the employed; but this is about the only advantage it possesses, as it is slower than the other type of table drier, the pressure of the air on the wool tending to press it down on to the netting and to make it more solid or "sadder," and so to resist the passage of the air through it to a greater extent. It is also subject to the irregularity of the drying caused by the air passing through the thinner places and over-drying them, leaving the thicker places wet. As previously stated, these table driers are being pushed out by machines which dispense with manual labor, and in which the wool is evenly and automatically dried by mechanical means to any required state of dryness

William Whiteley and Sons, of Huddersfield, were among the pioneers of the improvements in drying mechanism, and their first machine was of a semi-automatic character, as it required the wool to be fed in and taken away by manual labor, and its work was only intermittent instead of continuous; but while the wool was in the machine it was kept constantly moving and subject to the action of a current of hot air, each charge of the machine being left in until sufficiently dried, when it was replaced by a fresh supply of the wet wool. This machine was soon followed by a continuous action drier upon somewhat similar lines, into which the wool is fed by a traveling lattice, placed at the end of the last washing bowl and receiving the wool direct from the latter, so dispensing entirely with the manual labor of feeding the machine.

A sectional view of this machine is shown in the accompanying cut, and from this it will be seen to consist principally of three sets or layers of small rollers, each of which acts as a conveying platform or tray for the wool. The rollers of each individual layer are small in diameter and the full width of the machine, and placed with their centres in a horizontal line at such a distance apart that the wool is prevented from falling between them. On the outside of the casing of the machine are placed three horizontal shafts (one for each layer of rollers), driven by suitable gearing, and these shafts carry a series of worms, which gear with worm wheels placed on the end of each roller. The shafts are revolved so that the top and bottom layers of rollers carry the wool forward towards the delivery end of the machine, while the middle or intermediate layer works in the opposite direction.

The wet wool is fed on to the travelling feed lattice from the wash bowl, and carried into the machine and dropped on to the top layer of rollers, which carry it forward until it falls over the end on to the middle layer, this set of rollers taking it back again until it drops on to the lower layer, after traversing which it finally passes out of the machine by means of a travelling delivery lattice.

Under the machine is a tubular heater, through which air is forced by means of a fan, and the hot blast passes into the machine and up to the top layer, traversing with and through the wool in its passage in the machine, and effectually drying it to the desired degree by the time it reaches the delivery lattice, the degree of dryness being regulated by the supply of steam to the tubular heater.

It will, therefore, be seen that this machine, in common with all the later types, is entirely automatic in its action, dispensing with manual labor in feeding and with attention during the drying operation; and although much more costly in the first place, it is labor-saving, and capable of dealing with an enormously increased quantity of wool, as compared with the old table driers, for the wool, being kept in constant motion and every part being brought into contact with the hot air, is dried much more rapidly and more regularly, and in consequence of the machines being entirely boxed or cased in, the heat is more economically used, and the vapor and heated air are easily discharged into the open air instead of into the workrooms.

## OXFORD OVERCOATINGS.

The construction of the present overcoating fabrics upon the market is so varied, and the outlook for quite a change from the fabric now in use is so marked, that it is quite impossible to give a detail of construction and weave that would be sure to be on the lines of any coming cloth. Samples of popular lines vary somewhat in lay out and weave, yet the general character of the stock and mixtures, as well as the finish, does not vary to any great degree. It may be said that whereas the last season was prolific with twills and diagonal effects, the tendency at this time seems to be towards a fabric showing no twill, with a face more on the order of a melton, and yet retaining the soft cheviot "feel" and finish.

Regarding the selection of stock, the wool should be on the cheviot order, and short in staple. If any shoddy is used, anything on the worsted order that would give a wiry thread and lack fulling quality should be avoided. While the goods do not require a very heavy felting, they should possess the felting quality to render the finish soft. A medium-staple pulled wool is very suitable, especially for the white in mixtures, and any desire to cheapen the fabric should not interfere with the quality of this white. If it is finer than the black, so much the better. There are various shades on the market ranging from a 2½ per cent. mixture to one containing 25 per cent. of white. A line of shades nicely graduated may run as follows: 2½, 5, 10, and 15 per cent. of white.

The most important matter regarding the mixtures is the manipulation of the stock in the picker-room. Oxfords are the most difficult to get evenly mixed when handled in the ordinary manner; but by a special plan that should always be followed with mixtures of this character, the best of results may be assured. In making a mixture of 100 lbs., having 2½ or 5 per cent. of white, first take 2½ lbs. of white and 22½ lbs. of black and run them through the picker; or 5 lbs. with 20 lbs. of black may be used; either method would result in a mixture containing one-fourth of the lot. Now by laying down this mixture with 75 lbs. of black stock remaining, and running through the picker three times, oiling the second time through, the mixture will be about as uniform as it is possible to make it. It would be next to impossible to get the white evenly distributed by laying the small quantity down with all the black at first.

In making a 15 or 25 per cent. mixture, the preliminary mixture should be about half-and-half of the black and white. The lay out and weave being determined, the detail of the work would not vary from that of other goods until it came to the finishing-room. To secure a 28-oz. finished fabric, the goods should weigh from 33 to 34 ozs. from the loom, and should have from 16 to 18 inches to full. The fulling should be with cold soap, and care should be taken to avoid overheating, regulating the work to secure a moderate and uniform temperature.

The width from the fulling mill should be sufficient to allow the cloth to go on the dryer without stretching, otherwise the width would not be retained through the dry finishing process. The width from the dryer should be at least 1-in. more than the required finished width. As the finish does not call for any gigging, the cloth should be immediately extracted and dried after coming from the washer.

After drying, the cloth should be given three or four runs over the brushing machine with a moderately hard application, and with a moderate steaming with good live steam. By this process all the fibres that are not thoroughly felted down will be brought to the surface, and the steaming destroys the hard, stiff feeling produced by the previous processes. This steaming will tend to reduce the width to some extent, and it may be easily determined just what allowance should be made for it in the drying, and whether the 1-in. is sufficient.

The goods should now be backburled, and passed to the shear. While there will be but little shearing required, this operation should not be hurried; while one or two runs may seem sufficient, it will be better to give a few extra runs after the blades are down to the finishing point, in order to give ample opportunity for all the fibres on the face to be brushed up, thus securing an even and uniform face, and avoiding the possibility of the goods roughing up in the wearing, as is often the case when the work is hurried.

Following the shearing comes the specking, and a light brushing to clean the face before pressing. There is, among finishers, a diversity of opinion regarding how the cloth should be pressed for a cheviot finish. Some prefer running with the face up, thereby getting a less glazed effect upon the face, and requiring little if any steaming afterwards, but we would advise pressing with the face down. This gives an appearance to the face that seems far removed from the cheviot effect. The cheviot effect may be obtained by after-treatment, and a much more agreeable "feel" to the goods produced than in any other way. Give them the same pressure that other goods of the same weight should require, running them on to a roll. Possibly three or four pieces may be run on to a roll together, after which they should be wrapped with heavy paper, and allowed to lie twenty-four hours, for the cloth to cool and the pressure to become set. It is a great mistake to hurry the work, so as to be obliged to open up and handle the goods while they are warm, as much of the good effect of the pressing is thereby lost.

After the cloth has lain the required length of time, it will be found that the handling does not destroy the effect of the pressing, and the steaming can be more easily confined to the face of the cloth, and not be forced through, destroying a part of the pressure obtained. After the cloth has been removed from the roll, as many pieces as can conveniently be laid down at once for steaming should be sewed together, with a leader on the bottom or last piece, so that they can be run through without interruption. Sufficient steam should be turned on to entirely destroy the glazed effect on the face of the cloth. A little experimenting will soon show the amount required, when the turns of the valve wheel should be noted, and a mark placed upon it, so as to arrive at the same results every time.

The steamer should be well covered with felt or several thicknesses of cloth, so that the full force of the steam may be tempered, causing it to strike the cloth in a gentle, hot vapor, and not with a force that will penetrate the fabric.

After this process, says the "Textile World," the cloth should go to the inspector's perch, and then to the measurer and winder. The closeness of shearing, amount of pressure and final steaming should be subject to the good judgment of the finisher, which, with the directions given, should result in a well-finished fabric.

## POINTS FOR DYERS.

Ventilation in the dyehouse—Keep the dychouse well ventilated and free from steam; it pays. The writer has often been in dyehouses where it was quite impossible to see from one end to the other for the steam which was present. How can the men work comfortably under such conditions? How can they see when their work is properly done? Then, again, steam condenses and forms drops of water, which, if they get on to the goods, are liable to stain them. It is easy, in these days of fans and other ventilating appliances, to keep the atmosphere of a dyehouse free from steam, and although these may cost something in the first instance, yet, as the men can work better and quicker, their cost is saved in the increased output of work which is done, and by freedom from losses caused by stains from drops of condensed and often dirty water dropping from the roofs of the dye shops on to the goods.

Drying Wet Yarn.—The drying of dyed fabrics of all kinds is a matter of importance, and yet how little attention is given to the construction of the necessary appliances for carrying it out, and how few people have really a correct idea of the principles upon which drying is based. This is, perhaps, more particularly the case in connection with the drying of yarns, either in hanks or other forms. Piece goods are generally dried over drying cylinders or stentering machines, which work fairly satisfactory, although here there are one or two points that require attention, of which we will speak later on. We shall, however, first give some notice to the drying of yarns. Usually the dyehouse is provided with a drying stove, about the proper construction of which really very little care is often taken. We inspected one the other day, a description of which will show the lines on which these are usually built. The stove was about 8 ft. in height by 12 ft. long and 10 ft. broad, and on the floor was arranged a coil of steampipes. Near one end was the entrance door of iron, made to slide. The roof was nearly flat, but there was a slight rise to the centre, and here three little apertures, about 16 in. area each, were allowed. This stove was not found effective; the drying was slow, and no matter how high the temperature was, it did not affect the drying. Where lay the fault? Let us look at the question of drying, and we will suppose that we put a quantity of wet yarn into a closed room. The water it contains must leave it, and it can only do so by going into the air. Air has a fairly good absorptive capacity for water vapor; the normal air always contains some, and the hotter it is the more water it will take up. There is, however, a point when it becomes saturated and will not take up more. Now the air in our drying room will soon become charged with water vapor, and then no further drying can take place, and however long the yarns be left in that room they will never become properly dry. What has to be done then? Simply change the air. This is the whole secret of a successful drying stove—provide it with means for changing the air; and this is done in the best and simplest way by making provision for a current of air right through, cold fresh air passing in at the bottom, over the steampipes, through the yarn to be dried, and then out at the top of the stove. The natural tendency of heated air to rise will often be sufficient to provide this current of air, and a good current has wonderful drying properties. Never mind if the temperature inside the stove be 20° or 30° lower; the yarn will dry quicker in a current of air at 110° F. than it will in a closed room at 150° F. Hang a wet and dry bulb thermometer in the stove, and the greater difference there is in the reading of these two thermometers, the quicker will really be the drying power of the stove, because it shows that the air in the stove is far from saturated with water vapor. There is one defect of a closed-up drying stove that must be noted. If the water-saturated air cannot get away there is a tendency for some of this water to condense and form in drops about the roof, and these may fall on the yarns, causing spots and stains. There is not much risk of this in a stove through which a constant current of air is passing. We have not referred to the use of fans for mechanically creating a draught or current of air. We should say that anyone putting down a fan should have a drying stove built on lines which will work more economically and scientifically than the simple room we have in our mind in penning the above lines. In connection with drying cylinders we would only remark that here again the object should be to carry away by a current of air, all the water vapor which comes from the pieces which are being dried.

Preserving Wooden Dyevats.—Wooden dyevats and liquor cisterns, when used, sooner or later become saturated with the various liquors and chemicals, some of which will tend to rot the wood in time. Besides, such saturated vats are somewhat difficult to keep clean. In order to preserve wooden dyevats or tanks they might be covered over with a composition made by dissolving 2½-lbs. shellac, 4½-oz. rosin, and 4 oz. Venice turpentine in 1 gal. of methylated spirit. The ingredients are mixed together in a bottle or other convenient vessel and then shaken at intervals until they are thoroughly incorporated. This is applied by a brush, but care should be taken that the wood is quite dry. This composition will not affect, nor be changed by, any chemicals or dye liquors with the exception of caustic lyes.

It is foolish economy for a dyehouse to be restricted in its equipments; the work is never so well done, nor is it so quickly done. Let us take as an example indigo vat dyeing. In order to produce certain shades it is necessary to dip the cotton two or three times. In all the best dyehouses these dippings are done in separate vats, and the result is an excellent color. But for the sake of saving room and the time and trouble of setting several vats, some dyers will only have one vat, and the consequence is that the work turned out is not up to the mark. It is dull, and rubs badly, while the vat itself gets deficient in dyeing power very quickly, and becomes charged with deposited indigo. There is really in the end no saving, and there is no satisfaction to the dyer in turning out his work.—Dyer and Calico Printer.

## SPOTS ON LIGHT COLORED WOOLENS.

A German paper, Wollengewerbe, says: It is in the nature of things that light colored stuffs are more easily spoiled by spotting than those of dark hues, and hence require greater care in manufacture. Small marks which are invisible on dark fabrics are often conspicuous enough on material of a lighter shade. In the attempt to remove spots, especially specks of dirt or grease, there is much danger of their spreading and the evil becoming worse than before, whatever liquid may be employed for the purpose.

The first precaution towards the prevention of spotting is obviously to keep all the material, whether yarn or fabric, as much as possible away from all dirt, especially from rusty iron. Steaming chests must be tinned inside, to prevent condensed water, carrying rust, dripping on to the wool. It is useless to coat the iron with paint or composition, as none are known to resist steam for long, and all are apt to cause particularly unsightly and awkward spots. The more modern forms of spool for winding yarn are generally tinned to prevent it from being streaked with rust marks, in a moire sort of way. If a weft has to be woven damp, only one spool should be wetted at a time, and the practice of leaving the weft wet upon a

beam for days before it is used is one of the commonest causes of spotting. Special care is necessary in sizing warps for light dyeing, and it is best to keep a separate sizing and drying machine for such away from warps which are dyed with dark colors. If this cannot be done, the machine must be cleaned with the greatest care before being used for light warps, and all of those should be done one after the other before the machine is again used for the other kind. Any size left over in the trough from the dark warps must be carefully cleaned away; the slashing machine itself should also be cleaned, and fresh coverings put on the wringing rollers, as they are very apt to harbor dye, which they will transfer to the light-colored warp, especially if the latter stands between the rollers when the machine is not running, making a mark which will often show in spite of any washing or fulling. All the better kinds of slashing engines have a contrivance for lifting the upper covered roller, when the machine is not running. In weaving, care to prevent the fabric from touching dirt or grease must be continued. Lubricating oil is responsible for many spots. When petroleum is used, extra care is necessary as petroleum, being unsaponifiable, is very difficult or impossible to wash out. Vegetable lubricating oil often contains rust, or other metallic oxides, or verdigris from brass or copper, and hence is doubly likely to produce stains. Milled goods stand a better chance of being freed from slashing machine and loom spots than cheviots or loosely-woven fabrics, which are usually only washed once in the factory. Moving parts, which are apt to throw off oil, should be guarded, and no more oil should be used for lubrication than is necessary.

Another cause of spotting is moldiness. In hot weather mold is very apt to form on stuff left lying damp, and especially with those light colored ones that are the most prone to betray it. The boiling and mordanting which dark dyed stuffs undergo are great preservatives against mold; light-colored fabrics are not so guarded, especially when there is much white wool in them. White or vat-dyed wool is far more likely to mold than that which has been boiled and mordanted. Mold marks on light goods chiefly take the form of dirty white or yellowish streaks, and the ordinary means for destroying them, such as the application of dilute acid at high temperatures, the so-called carbonizing, are inadmissible with such goods. All receptacles in which goods must lie must be carefully and frequently cleaned, best with a cloth dipped in some antiseptic. It is better, if the goods have to be left over Sunday, or a holiday, to hang them up than to pile them in heaps at the floor level.

Another important precaution is never to wash light and dark-colored stuffs together, lest the dye should become more equally shared between them, especially considering the great number of dyes that are in use which are anything but fast to washing. Wet dark and wet light stuff should, for the same reason, never be put together. In machines used for washing light fabrics free surfaces of iron, copper, or brass should always be tinned over. Iron is especially dangerous, as it rusts very rapidly, and even if often cleaned will rust quite enough during one washing to do harm. Another obvious precaution is to get the washing over as soon as possible, and especially never to leave the goods in the machine over night. Yet another kind of spot is the pale reddish mark resulting when goods washed with ammonia come into contact with copper or brass. Ammonia attacks those metals instantaneously, especially if it has not been thoroughly mixed with the soap lye. Cuprate of ammonia is formed, and forms spots which are very visible on light goods, and cannot be got rid of, for the only means of destroying them—viz., the application of dilute sulphuric acid—acts energetically on the light dyes. This is another reason for avoiding the use of copper or brass, or keeping them carefully tinned.

Carbonization spots rarely occur on light fabrics, for the very good reason that it is rarely necessary to subject them to that process, both on account of the color, and because vegetable fibres do not make themselves very conspicuous on such goods. When, however, a light dyed stuff is carbonized, special care must be taken on all the lines already indicated. In all treatment and handling of light colored goods cleanliness of the hands and clothes of the workpeople cannot be too much insisted on. To remove oil spots, benzine is the best material, and should be applied, if possible, with a rag of the same color as the stuff to be cleaned, and never with a dark dyed rag. Quillaia, or ammonia, with soap often renders good service. Rust marks are best treated with a quite weak solution of salt or sorrel. Too strong a solution is apt to injure the wool or the dye. If the first solution used is not sufficiently powerful, it can be made stronger with caution.

## LEATHER BELTING.

The display of belting made by the J. C. McLaren Belting Co., of Montreal, Toronto and Vancouver, merited the deserved attention it received during the recent Toronto Exhibition. This firm are the pioneers in the leather belting trade of Canada; established in 1856, or 45 years ago, their goods are known as high class. Having always a regard for the quality and workmanship, this naturally has been the result. Competition in this line, as in almost every article of manufacture in these days, has led to reducing standards; especially so has this been the case amongst the leather belting manufacturers all the world over, and Canada has not escaped this questionable method of trade.

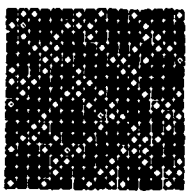
The result has been that the buyer naturally views with suspicion every low priced figure that comes under his notice. Many of them still, however, hopeful that low prices are consistent with high qualities (working against their own experience if manufacturers), have converted their factories into sample rooms of belt transmissions. Do they ever consider the loss of time occasioned by one counter-shaft belt giving out during the working hours of the factory? Do they ever add up the hours per year of individual machines being stopped and improperly laced by the mechanic operating the said machine, in his haste to turn off his "piece work" further destroying the belt by a possible want of knowledge how to lace the same? All these little items of expense can be controlled and reduced to a very small item if greater care were taken in the first place in attention being paid to the quality of the belt employed, and in the second place to engaging only one in a factory for the placing on of belts and lacing or making endless as the case may be. There is not one mechanic in every hundred who has taken care to learn how the lacing of a belt should be done, and in after years if he does know, it has, nine times out of ten, been acquired through stumbling on to the way. Employers lose 10 per cent. of the value of the belting almost yearly through this uncalled for negligence. Belting made of the very best material, the economical buyer can appreciate, is less exposed to this maltreatment.

The J. C. McLaren Belting Co. claim that this is one reason, and the most important one, that has kept their production always in the lead, and it has led up to the issue of a neat pamphlet which bears the suggestive title of "Quality our Silent Partner;" this contains the names of representative firms from Nova Scotia to the Pacific who are using daily, with every satisfaction, their "Extra" brand English oak-tanned leather and their "Thistle" brand friction face rubber belting.

# Textile Design

**(From The Textile Record, Philadelphia).**

WORSTED SUITING.



Complete Weave.
Repeat 16x16.

Warp :—2,770 ends, 2/16's worsted, 16-harness straight draw.
Reed :—10½x4.
Filling :—42 picks per inch, 2/16th's worsted.
Finish :—Worsted finish ; 56 inches wide.

FANCY CASSIMERE.

Complete Weave.
Repeat 4x4.

Warp :—3,450 ends.
Reed :—13½x4.
Dress :—

| | |
|---|---|
| 2 ends, 5-run white, | |
| 1 end, 2-ply, 10-run white and 8-run brown twist, | |
| 3 ends, 5-run white, | |
| 2 ends, 2-ply, 10-run white and 8-run brown twist, | x8=96 ends |
| 1 end, 5-run white, | |
| 3 ends, 2-ply, 10-run white and 8-run brown twist, | |
| 2 ends, 5-run white, | = 2 ends, |
| 1 end, 2-ply, 10-run white and 8-run brown twist, | = 1 end, |
| 3 ends, 5-run white, | = 3 ends, |
| 1 end, 2/60's worsted orange, | = 1 end, |
| 1 end, 2-ply, 10-run white and 8-run brown twist, | = 1 end, |
| 1 end, 5-run white, | = 1 end, |
| 3 ends, 2-ply, 10-run white and 8-run brown twist, | = 3 ends, |

Repeat of pattern : 108 ends.

Filling :— 58 picks per inch, arranged thus :

| | |
|---|---|
| 2 picks, 2-ply, 10-run white and 8-run black twist, | x30=120 pks., |
| 2 picks, 5-run black, | |
| 2 picks, 2-ply, 10-run white and 8-run black twist, | = 2 picks, |
| 1 pick, 5-run black, | = 1 pick, |
| 1 pick, 2/60's worsted, red, | = 1 pick. |

Repeat of pattern : 124 picks.
Finish :—Scour well, clip or shear ; finished width 56 inches.

WORSTED TROUSERING.

Complete Weave.
Repeat 4x4.

Warp :—3,690 ends, all 2/36's worsted, 8 or 12-harness straight draw.
Reed :—10x6.
Dress :—

6 ends, navy blue.
2 ends, cream.
1 end, navy blue.
2 ends, cream.
1 end, crimson.
6 ends, navy blue.
2 ends, cream.
1 end, navy blue.
2 ends, cream.
1 end, crimson.
6 ends, navy blue.
2 ends, cream.
1 end, navy blue.
2 ends, cream.
1 end navy blue.

36 ends in repeat of pattern.

Filling :—52 picks per inch, all single 18's worsted, arranged thus :

1 pick, crimson.
1 pick, gold.
1 pick, lavender.

3 picks in repeat of pattern.
Finish :—Worsted finish ; 56 inches wide.

There is no small amount of capital invested in the United States in turning out starched apparel. The collar and cuff trust represents $20,000,000.

## TO CLEAN LINOLEUM.

From time to time enquiries have come to this office as to the best way to clean linoleum, and to retain its natural gloss. One or two enquired if varnish could be applied to the surface. To varnish linoleum would be to destroy its life and elasticity, making it little better than ordinary oil-cloth. The best method, according to a number of cleaning concerns, who have been interviewed in the matter, is simply to wash the linoleum with tepid water and some good soap, in which there is not too strong an alkali. A cup of sour milk added to two gallons of water, may be used to bring out the gloss, and gives admirable results. There is great danger in using any chemical preparation in work of this kind, as it is not only liable to ruin the essential resiliency of the cork, but to fade the colors in the pattern.—Am. Carpet and Upholstery Journal.

## A NEW AGENCY.

Recognizing the growing demand for flax, tow, jute and hemp yarns, the William Firth Company, 67 Equitable Building, 150 Devonshire street, Boston, are pleased to inform the trade that they have just secured the sole agency for Canada and the United States for the sale of the machinery of James Mackie & Sons, Ltd., of Belfast, Ireland, who are very large makers of machinery for the preparing, spinning and finishing of these classes of yarns, and would be pleased to quote prices on any machinery which may be required for existing plants, or will be pleased to quote on complete equipments for new industries. We may say that the above firm of Messrs. Mackies is one of the oldest established shops, but have a modern up-to-date plant, and they are a firm who have kept pace with the times. The William Firth Co. would be pleased to furnish circulars or answer any communications to anyone interested in the above machinery.

## EMBLEMS OF EMPIRE IN A TABLECLOTH.

An English linen manufacturer has made recently a table-cloth, whose design represents the British Empire. The pattern is composed of a broad outer border of delicately formed and artistically arranged festoons of the rose, thistle and shamrock; and this outer border is attached or suspended from the inner border, which shows on the flat surface of the table and is about seventeen inches wide. This inner border is the chief feature of the design, and is composed of a series of small tableaux, or panels, each encircled by a laurel wreath and representing a colony, the name of each colony is indicated on a scroll underneath each panel, and adds materially to the general effect of the design. The wreaths or panels are bound together with the rose, thistle and shamrock, treated in a semi-heraldic manner; above each of the corner panels the Union Jack and the royal standard are crossed and tied together with delicate sprays of shamrock, thus lending interest to the four corners of the table, and the same arrangement of flags appears also on the outer or hanging border in each corner. In the centre of the cloth the sun, with its rays extending to all parts of the world, gives an excellent suggestion of the magnitude of the Empire, upon which, proverbially, the sun never sets. In one of the corner panels the United Kingdom is represented by the watchful and dignified king of the forest. In the second corner Australia, New Zealand and Tasmania are represented by a group of kangaroos, while the third corner is occupied by a typical group of South African ostriches. On the ribbon attached to this tableau are the names of the newly acquired colonies—the Orange River Colony and the Transvaal. The

fourth corner is given to Canada, and embraces Newfoundland and Nova Scotia, and is idealized by a river scene, in which the elk and beaver appear. In like manner, India with its tiger hunt, Rhodesia with its trek oxen, the Soudan with its camel, are accurately depicted with remarkable detail, considering the limited space at the disposal of the designer and weaver. Gibraltar, Aden and Hong-Kong are shown in a more picturesque and realistic form. There are ten panels in a three yard cloth, and, of course, in a larger cloth more panels are introduced, the principal of which are the Straits Settlements, British Guiana, the West Indies and Malta. The serviettes match the cloths, and are carried out most successfully.

## GROWTH OF UNITED STATES TEXTILE MANUFACTURING.

In the United States 400 new textile mills were established in 1900, the growth being more than double the yearly average of the previous eight years. The following table shows the record of the past five years in mill building in each of the leading branches of textiles:

| | 1896. | 1897. | 1898. | 1899. | 1900. |
|---|---|---|---|---|---|
| Cotton | 66 | 49 | 34 | 91 | 171 |
| Woolen | 31 | 53 | 25 | 49 | 48 |
| Knitting | 85 | 71 | 46 | 57 | 109 |
| Silk | 17 | 43 | 19 | 32 | 43 |
| Miscellaneous | 8 | 14 | 10 | 16 | 29 |
| | 207 | 230 | 134 | 245 | 400 |

## MR. ELLIS ON THE WOOLEN TARIFF.

Jonathan Ellis, of the Port Dover Knitting Mills, writes to The Globe as follows, taking as his text the paragraph which appeared in The Globe's Ottawa correspondence giving some statistics of the woolen imports: The flippant reference to our woolen mills by your Ottawa correspondent in your issue of the 19th inst. is unworthy of The Globe. The condition of our woolen industry is altogether too serious to be brushed aside in any such contemptuous manner. Your correspondent's ignorance as to the deplorable condition of our woolen mills is only too evident, consequently his opinion goes for nothing. With the great curtailment in the output of our woolen mills, consequent upon the enormous importations of woolen goods under the preferential tariff, to the value of $10,000,000 the past year, the conditions cannot be other than serious, and if relief is not speedily brought to bear many of our woolen mills must soon cease to exist. In my humble judgment the duty on woolen goods, in face of the preferential tariff, should be placed at 45 per cent., which would be a protection of only 30 per cent., and this would be absolutely nothing in view of the advantages enjoyed by our Old Country competitors in cheaper money, cheaper fuel, much less cost for plant, lower wages, etc. With the manufacture of even one-half of the above amount of goods secured to our woolen mills, constant employment would be afforded to at least 2,000 people, who, if present conditions continue, must leave the country. I am to a considerable extent in sympathy with the preferential tariff, but I cannot shut my eyes to the fact that it is working to the great detriment of our woolen industry, upon which it bears more hardly than any other. A protective policy, wise or otherwise, having caused the establishment of so many woolen mills, it now only remains to give this industry such consideration as it reasonably demands, so that the enormous amount of capital thus invested will not be altogether jeopardized. I am sure, if the individual members of the Dominion Government will only give this matter due thought, the result will be the preservation of an important and deserving industry.

## THE LOSS ON IMPERFECT KNIT GOODS.

Recently, while passing the show window of a prominent New York department store, my attention was attracted to a display of ladies' ribbed vests marked 5 cents per pair. Desirous of knowing more about such apparently great bargains, I entered the store, and found the women swarming like bees around the counter where these goods were being sold and grabbing at them as the crowd grabs at articles at a rummage sale.

A brief examination showed me that some of the garments were "seconds," others might be called "thirds," and there were others which it would be difficult to put in any class. Evidently the machines on which the goods had been knit were in the worst possible condition. The best garment in the stock had a dropped stitch the entire length, others had holes fairly well mended, while some had been punctured, and the time spent in mending them had been thrown away. Quite a large percentage of them contained so many holes that they had the appearance of tripe.

It is fair to presume that the retailer was not losing anything on them, and even if made with number 10 short staple cotton yarn, the cost of the yarn, manufacturing and handling would cause a heavy loss to the manufacturer at a retail price of 60 cents per dozen. Many of the imperfections could have been obviated even with short staple, badly carded and spun yarn. This sale was a striking illustration of the results of manufacturing in a badly managed mill. I looked over the imperfections and pictured in my mind the help in the knitting room collected together engaged in conversation, while the machines were caring for themselves.—Fleetwood in Textile Word.

## LITERARY NOTES.

The October number of the Canadian Magazine is a Royal Number, and in view of the visit of the heir apparent and his consort is largely taken up with matters concerning them. There are articles on the Significance of their Visit, on their Life at Home, descriptions of Presentation at Court and of the Royal Train on which they are travelling. All these are well illustrated, and there are excellent portraits of the Royal pair and their children. There is also an account of the visit to Australia and the Cape, and a map showing the extent of their travels. Among other articles are one on Canada at the Glasgow Exhibition, and a very timely one on the new Sugar Beet Industry. The writer of current events deals with the late President McKinley and his successor President Roosevelt. The number is a most interesting one.

The October Century has its usual variety of interesting subjects. Perhaps the most interesting from the engineer's standpoint is How to Cross the Atlantic in a Balloon, by S. A. King, the Nestor of American aeronauts, one who is most cautious and reliable, and who does all sorts of things with his balloon, relying on his management rather than on adventitious circumstances which he cannot control. An introduction to the article is written by Cleveland Abbe, Professor of Meteorology in the United States Weather Bureau, who speaks very highly of Mr. King as an aeronaut.

The Ladies Home Journal keeps up its reputation in the October number. Mr. Bok, with characteristic enterprise,

has added ten new editors and fifteen new departments to his journal, most of which make their initial appearance this month. Among the former is Ernest Seton-Thompson, author of Wild Animals I Have Known. Rudyard Kipling contributes a story How the Leopard Got His Spots, one of three which he prepared for the journal while resting in Boer-Land.

The Annual Review of the Silk Industry in America, issued by the Silk Association, makes a pamphlet of considerable size. It refers to the increasing competition, which happily has led to more prudent conduct of the business during the past year, to the Labor Troubles in Pennsylvania and New Jersey, to the outlook, which it declares to be better than at this time last year, with firmer prices, and deals in detail with raw silk supply and conditions, and gives the usual semi-annual statistics. There are now 36,000 broad looms, 7,000 ribbon looms and 1,000,000 throwing spindles in the United States silk factories, with a proportionate number of accessory spindles, such as winding, doubling and reeling. This plant, if worked all the time, would produce more goods than the market could consume. The result has been that many of the mills have been running short time. The quantity of raw silk imported was 8,886,670 lbs., as compared with 10,965,098 lbs. for the previous year, a reduction of 19 per cent. Notwithstanding some drawbacks the review is on the whole hopeful in its tone.

We have to acknowledge the receipt, from the Textile World, of its Directory of the Trade for the year 1901. In addition to the regular features of previous years, including maps, etc., it contains a new Yarn Trade Index of spinning mills, classified according to kind of yarn spun, list of commission and order mills and classified directory of dyeing, bleaching and finishing establishments, list of wool shoddy manufacturers, mills with worsted machinery, etc. The price of the book is $2.50 for office edition, and $2 for traveller's edition. It will be found most useful.

## Among the Mills

**Co-operation is one of the guiding principles of industry to-day It applies to newspapers as to everything else. Take a share in "The Canadian Journal of Fabrics" by contributing occasionally such items as may come to your knowledge, and receive as dividend an improved paper.**

The Star Whitewear Co., of Berlin, is working overtime to catch up with its orders.

There is a rumor that the reduction works at Keewatin are to be converted into a pulp mill.

The flax mill at Thedford, Ont., was burned on Sept. 11. The storehouse and stocks were saved.

The Riordan Paper Mills, incorporated under a Dominion charter, has increased its capital stock from $500,000 to $1,000,000.

A young woman named Findlater, employed in the Hespeler mills of the Canada Woolen Company, had her arm badly injured in a loom which she was fixing when another employee started it.

Geo. Dick, designer in the Canada Woolen Mills, Carleton Place, who recently resigned to accept a similar position in the Hespeler mill, before leaving Carleton Place was presented by his fellow-employees with a handsome gold-mounted cigar and cigarette holder. His successor, W. R. Campbell, acted as chairman at the farewell meeting.

The Galt Knitting Co. has in addition to an extension of its buildings, installed a fine system of fire protection in the form of a pump and automatic sprinklers. The pump has a capacity of 750 gallons per minute.

There are now about 500 men employed at the Spanish River Pulp Co.'s mills near Webbwood, and contracts have been let to the amount of $750,000. Thos. Sheppard and Wm. Irwin are looking after the work.

The mayor of Dundas stated at a recent meeting of the council that the by-law exempting the Leonard Knitting Mills from taxation is not worth the paper it is written on, and any ratepayer could have it quashed.

A meeting of Elora ratepayers has recommended the council to submit a by-law giving a bonus of $2,500 to Mr. Mundell, chair manufacturer, to assist him in acquiring the woolen mill property of Bain & Co., recently burned out.

Judge McLeod has decided to have two liquidators for the Chatham, N.B., Maritime Sulphite Fibre Co., and appointed Hon. L. J. Tweedie and A. H. Hanington. There are unsecured creditors to the amount of over $200,000.

Charles E. Hill's carding mill at Nashwaskis, N.B., was burned down on Sept. 21st. The fire caught from a picking machine. The loss is estimated at $3,000; insurance, $1,500. Mr. Hill had a mill on the same site destroyed by fire in 1899.

The Preston Glove Company, to which reference has already been made, has obtained its charter from the Ontario Government. The incorporators are: George A. Clare, Cyrus Dolph, Peter Bernhardt, Frederick Stecho, W. J. Schlueter, C. R. Hanning, E. B. Salyerds, W. F. Mickus, John Wirocning, Geo. A. Roos and A. J. Jeffery, all of the town of Preston. The capital is $20,000.

The Cushing sulphite pulp mill at Fairville, N.B., the largest in the province, owned chiefly by Capt. Partington, of Manchester, Eng., has changed its management. The principal directors now are, James Beveridge, Capt. Partington's manager, and Charles Springer, of Boston. It is expected to run the mill steadily in future.

The following reductions in wages have been made at the Ste. Hyacinthe woolen mills by the Board of Arbitration to whom the difficulty was referred: On wages exceeding $6 a week, but not exceeding $7, five per cent.; on wages ranging from $7 to $10, ten per cent.; from $10 to $18, twelve per cent.; from $18 upwards, twenty-five per cent.

The by-law granting aid to the Streetsville, Ont., woolen mill, now owned by Brodie & Co., has been carried. The amount of bonus is $6,000, and it is given, not in cash, but in machinery, which will remain the property of the town. This, we understand, is the first bonus arrangement made in this form in the case of any textile mill in Canada. Brodie & Co. will, however, purchase the mill, and run it to its full capacity.

The case of Boas vs. Boas would make interesting reading, especially for political clubs. Mr. Boas is manager of the Canadian Woolen Mills. Five years ago he was an active supporter of Sir Wilfrid Laurier and his Government. He declared he could do splendidly under the Liberal tariff, including, we presume, its preferential clauses. Now Mr. Boas has a different story to tell. He asserts that the present tariff has been so disastrous to his mills that they have lost $175,000 in two years, and adds that it is necessary either to shut up or to reduce the wages of the operatives ten per cent. This proposed reduction is what caused the recent strike in St. Hyacinthe. The full dinner pail has become very much compressed in size.—St. John's News.

The Almonte Knitting Co. has been making improvements to its property.

The Anchor Knitting Co., of Almonte, is making additions to its premises to meet expanding trade.

Eleven winders at the Kingston cotton mill took a half holiday without leave, and lost their situations in consequence.

A branch of the Canada Woolen Mills, Ltd., will probably be started at Toronto Junction, in the old Hees factory.

Twenty-one stapling and worsted spinning mills in Germany show an aggregate loss of 50,000,000 marks, equal to £2,500,000 sterling, in 1900, the result of over-trading and over-production.

A new chimney is being built for the Montreal Cotton Co., Valleyfield, which will rank with the highest in the Dominion. Its dimensions will be: Height, 201 feet; foundation, 36 feet square; greatest diameter, 18 feet 10 inches; smallest diameter, 12 feet 9 inches; square at bottom, 19 feet 6 inches; solid concrete bed, 14 feet by 36 feet; core, 9 feet diameter. Wighton, Morrison & Co., Montreal, have the contract.

The terms of agreement upon which W. J. Webster will erect and maintain a woolen mill at Edmonton have been settled. Mr. Webster covenants to have erected and in operation by the 1st of June next a two-set mill. The buildings are to cost not less than $2,500; the machinery $15,000. The mill is to be operated for ten years, for not less than four months in the first and six months each succeeding year. On completion of the mill the town agrees to pay $500 as a bonus. The property and plant is exempt from taxation for ten years. If Mr. Webster should fail to operate the mill from any cause he shall repay to the town $50 for each year of the said ten years in which such failure shall occur. If from any cause the mill goes out of business Webster agrees to repay the balance of the $500 unearned.

The terms of settlement of the dispute between the Sturgeon Falls Pulp Co. and Edward Lloyd, Ltd., are not to be announced till October 10th. The papers have been signed by the solicitors, but have to be ratified by the boards of the two companies and signed by the arbitrator. The agreement will settle a vexatious controversy. Upwards of a year ago Edward Lloyd, Ltd., purchased from the Sturgeon Falls Pulp Company its rights in the pulp wood concession granted by the Ontario Government, and also the pulp and paper mills and water power at Sturgeon Falls. Some time after the purchasing company protested that the land was not as well timbered with pulp wood as was represented, and that the waterpower was also below what was understood. The Sturgeon Falls Pulp Company maintained that both were up to the representations. Negotiations failed to settle the difference and arbitration was agreed to. Hon. Charles Fitzpatrick, Solicitor-General, was appointed sole arbitrator. The matter has been under enquiry for a long time, explorers having been sent into the region covered by the concession to ascertain for the arbitrator the quantity of pulp wood to be found there.

---

Fire caused $125 damage to the premises of E. & S. Currie, neckwear manufacturers, Toronto, on the 2nd Oct.

Sam. P. Lindsay and Jos. Jacobs, of Montreal, both give notice that the partnership which has hitherto existed between them, under the name and style of the Metropolitan Dyeing Works, Cleaning and Pressing Company, has been dissolved. The business will be liquidated by Samuel P. Lindsay, after which he will continue in the same line, under the same name.

## FABRIC ITEMS.

Brown is shortly to be the fashionable color in clothing.

Wm. Ross, hatter, Halifax, has assigned with liabilities of from $2,000 to $3,000.

A bulletin of the Ontario Bureau of Industries just issued gives the wool clip of the province for 1901 as 5,834,097 lbs.

The Canadian Hammock Manufacturing Co., limited, has been authorized to do business in Ontario, with John Allan, of the town of Paris, its representative.

Owing to certain conditions imposed by the factory inspectors of Ontario, T. Lindsay & Co. are reported to have decided to have their ready-made clothing manufactured in Montreal.

The binder twine factory which it is proposed to start at Almonte will have a capacity of four tons daily. The name of the company is to be the Ottawa Valley Binder Twine Co., and its proposed capital is $100,000.

The paper industry of Germany is said to be suffering from the general depression. Manufacturers are receiving few orders, and in Berlin and Saxony are endeavoring to dispose of their productions at any price.

Dun's Review says of the cotton crop that in Texas it will be much lighter than last year, while in the eastern states it will be equal to, or perhaps in excess of, last year's. The season is late and stocks at southern mills are low.

Speaking of flax the Ontario Bureau of Industries bulletin says of this year's crop: This crop has done well where raised, but it is not so largely grown as formerly. It has done better in the Lake Huron counties than in the West Midland group.

The Dominion Laundry Soap Co., limited, has been incorporated with head office at Toronto. The capital stock is $30,000, and the incorporators are J. W. Young, John Ausman, Charlotte E. Young and Carrie Ausman, their wives, of Toronto, and James A. Ross, of Detroit.

Henry E. MacIntosh, Harry G. Fenlin, Leslie R. Dowker, Mary Elizabeth Fenlin, of Montreal, and C. S. Hyman, of London, have been granted a Dominion charter as the Fenlin Leather Co., Ltd., with a capital of $250,000; to carry on the leather manufacturing business.

W. J. McFarland, J. F. Gray, W. E. Southgate, Sarah Southgate, his wife, and Orrin A. Gray, of Toronto, have been incorporated as McFarland, Gray and Southgate, limited, with a capital of $200,000, to take over and carry on the clothing business of McFarland, Gray and Southgate.

Henry Arkell, a well-known sheep breeder, of Guelph, has this season sold nearly four hundred pure bred Oxford-down sheep, shipments having been made, among other places, to Nova Scotia, Assiniboia, Alberta, British Columbia, Wisconsin and Indiana. He has still three hundred head left.

Large quantities of spruce suitable for pulp are found to exist in Newfoundland, and the fir of that island is said to be as good as the spruce for pulp making, recent tests having given satisfactory results. Several United States concerns which have heretofore obtained their pulp in Canada are looking to Newfoundland for their supply. Mr. Reid is said to have in view the establishing of a pulp industry on a very large scale.

The season for blankets is commencing and already some good sales have been made. Last year, about this time, there was a good demand for grey blankets in Cape Breton, but nothing to equal it has developed this season, which is to be explained by the fact that less construction work is going on and many of the blankets bought last year are still serviceable. There has been a reduction in the price of grey blankets of about five per cent.

An Ottawa despatch states that some 450 families in that city and Hull will be thrown out of employment by the decision of an Ottawa clothing house to hereafter have its ready-made clothing manufactured outside these two cities. The decision has been occasioned, the firm states, by the action of Government inspectors and labor representatives, who they allege have been persecuting them by conditions which they cannot comply with.

The Strathcona Rubber Company; capital, $50,000; head office, Montreal; has been incorporated under the laws of the Province of Quebec, to carry on the manufacture of clothing, oil clothing, rubber clothing and all kinds of rubber goods. The charter members are: E. L. Rosenthal, A. M. Joncas, Joshua Rosenthal, James Cranshaw and William Campbell, of Montreal. The company has bought a property on Papineau Square, Montreal, consisting of three buildings and an extension, with engine and boiler house, containing 23,075 square feet, all of which will be used for the manufacture of rubber coats. The newest type of machinery is being imported.

# Personal.

E. P. Foley, manager of the Davy pulp mill at Thorold, has three brothers in similar positions, at Reilly, Maine; Alpena, Mich., and Nekoncgan, Maine.

George Dick, designer in the Canada Woolen Mills at Carleton Place, has been transferred to Hespeler, with increased responsibility. He is succeeded by W. R. Campbell, of Cornwall.

Morris Cogan, who was superintendent of the Beaver Dam, Wis., cotton mills, has returned to Hamilton to his old position as boss carder and spinner for the Canadian Colored Cotton Co., the Beaver Dam mill having closed down.

## THE WOOL MARKET.

The fifth series of Colonial wool sales closed on October 10th in London. The competition was very animated, and as a result good prices were obtained, notwithstanding large offerings. The quantities offered ran from 10,000 to over 17,000 bales per day, the amount increasing daily under the stimulus of good prices. Continental buyers purchased largely. The general demand during the entire series was strong. In all 305,000 bales were available, of which 283,196 were catalogued. The total sales numbered 141.000 to the home trade. 127,000 to the Continent, 30,000 to America, and 34.000 held over. Merinos were in strong demand, and advanced 7½ per cent., the most pronounced rise taking place in medium and inferior greasies. All scoureds, which were freely purchased by French and German buyers, showed further hardening as the sales progressed, the finer scoureds sold fully 10 per cent., and superior grades 5 to 7½ per cent. above the July average; subsequently medium merinos weakened slightly but recovered. Fine crossbreds advanced 5 to 10 per cent. to the highest points of the series; superior held the advance until the close, but medium and inferior merinos, owing to a falling off in Continental competition, weakened somewhat. The closing tone was firm, coarse crossbreds declined until prices reached 5 per cent. below the July series. Stocks of merinos were practically cleared up. Stock held over was almost wholly crossbreds.

Arrivals are coming in for the sixth series, which will commence on Nov. 26. There have already arrived for it well on to 200,000 bales.

A cablegram received in London on Sept. 26th from Adelaide, stated that the wool sales had opened that day. Prices for greasy wools were from 15 to 20 per cent. higher than last season's opening rates. The clip is reported as good.

In the Toronto market there is no change to record, and transactions are few. There have been absolutely no change in prices since our last quotations. Pulled wools are slow. We quote: Washed fleece, 13c.; unwashed, 8c.. Pulled wools, supers, 15c. to 16c.; extras, 17c. to 18c.

In Manitoba there is a much better feeling in the wool market, which is particularly noticeable in the finer grades. Some parcels changing hands have commanded ten and fifteen per cent. advance, and in one or two instances twenty per cent. has been paid. Sales are confined to limited quantities. Local prices are as follows: Greasy, 13c. to 15c.; Australian greasy, 16c. to 17c.; B.A. washed, 25c. to 32c.; Canadian pulled, 14c. to 18c.; do. washed fleece, 13½c. to 14½c.; Canadian greasy, 8½c. to 10c.; Northwest fleece, 10c. to 11c.

According to Coates Brothers circular, the average of one hundred grades of wool was 17.25 cents on Oct. 1st, a slight advance over the average on Sept. 1st, and a better gain still as compared with the low level of 17.06 during the worst depression of midsummer. The extent of the decline is apparent when the average of 19.64 a year ago is remembered. They add that market conditions are now most satisfactory, a brisk movement continuing on old orders, and holders insisting on full values in new contracts. The London sales are largely responsible for this.

The Dominion Brussels Carpet Co. at Sherbrooke, have decided not to enlarge their works till next season, the present business outlook not warranting the outlay.

A suggestion to use denim, a cotton material manufactured in the United States, instead of carpet, to cover the platforms on which Royalty was received at Toronto, called forth a vigorous protest from the carpet people, which had its effect and carpet was used.

Many of the woolen mills are running short time, the effect of the preferential tariff. Orders are being cancelled as buyers find they can make better terms for English goods. The mills have to devote more attention to samples in order to meet the competition.

The awards at the Pan-American have just been announced. The following in fabrics come to Canada: Oxford Manufacturing Co., Oxford, N.S.; Oxford tweeds, homespuns, gold medal; Independent Cordage Co., Toronto, manilla and sisal rope and binder twine, silver medal; Canada Furniture Co., Toronto, furniture, bronze medal; Miss Minnie Bower, Aylmer, Ont., lace, honorable mention; Province of Ontario, Toronto, indurated fibreware, honorable mention.

## TEXTILE PUBLICATIONS.

In order to accommodate readers of The Canadian Journal of Fabrics, the publishers will be pleased to mail any book in the following list on receipt of the publisher's price, duty free. Books on technical and practical subjects, not in this list, can be obtained and mailed at publisher's prices. In ordering, please give full address, written plainly:

Loom Fixing; a handbook for loom fixers working on plain and fancy worsteds and woolens; containing chapters on shuttles and bobbins, and their management; head motion; putting in warps; filling; adjusting and starting new looms; chain building, etc.; 104 pages, by Albert Ainley ..... $1 00

Technology of Textile Design: explains the designing for all kinds of fabrics executed on the harness loom, by E. A. Posselt ..... 5 00

Structure of Fibers, Yarns and Fabrics, the most important work on the structure of cotton, wool, silk, flax, carding, combing, drawing and spinning, as well as calculations for the manufacture of textile fabrics, by E. A. Posselt ..... 5 00

Textile Machinery Relating to Weaving, the first work of consequence ever published on the construction of modern power looms, by E. A. Posselt..... 3 00

The Jacquard Machine Analyzed and Explained; explains the various Jacquard machines in use, the tying up of Jacquard harness, card stamping and lacing, and how to make Jacquard designs, by E. A. Posselt..... 3 00

Textile Calculations: a complete guide to calculations relating to the construction of all kinds of yarns and fabrics, the analysis of cloth, etc., by E. A. Posselt.. 2 00

Wool Dyeing: an up-to-date book on the subject, by E. A. Posselt ..... 2 00

Worrall's Directory of Cotton Spinners, Manufacturers, Dyers, Calico-printers and Bleachers of Lancashire, giving the mills of the British cotton district, with number of looms and spindles, products of the mills, cable addresses, etc ..... $2 00

Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc ..... $2 00

Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00

The Wool Carder's Vade-Mecum, by Bramwell; third edition, revised and enlarged: illustrated; 12mo..... 2 50

## CHEMICALS AND DYESTUFFS.

Nothing new to report; market remains firm; demand for chemicals and dyestuffs is small.

| | | | |
|---|---|---|---|
| Bleaching powder | $ 2 75 | to | $ 3 00 |
| Bicarb. soda | 2 00 | to | 2 05 |
| Sal soda | 0 75 | to | 0 80 |
| Carbolic acid, 1 lb. bottles | 0 50 | to | 0 60 |
| Caustic soda, 60° | 2 35 | to | 2 60 |
| Caustic soda, 70° | 2 60 | to | 2 85 |
| Chlorate of potash | 0 13 | to | 0 15 |
| Alum | 1 35 | to | 1 50 |
| Copperas | 0 65 | to | 0 70 |
| Sulphur flour | 2 00 | to | 2 50 |
| Sulphur roll | 2 00 | to | 3 00 |
| Sulphate of copper | 6 00 | to | 6 25 |
| White sugar of lead | 0 08 | to | 0 08 |
| Bich. potash | 0 11 | to | 0 12 |
| Sumac, Sicily, per ton | 75 00 | to | 80 00 |
| Soda ash, 48° to 58° | 1 30 | to | 1 40 |
| Chip logwood | 1 90 | to | 2 00 |
| Castor oil | 0 09 | to | 0 10 |
| Cocoanut oil | 0 10 | to | 0 11 |

—One of the last surviving of the old sumptuary laws, now almost forgotten, but considered of great importance in maintaining one branch of Sheffield trade, was that directed against covered buttons. The town dealt largely in horn buttons of different kinds for common wear, as well as in metal and plated buttons for the better class of coats, waistcoats and gaiters. From 1720 to the end of the century the town annals show that there was considerable, though fitful zeal, under the statute of 8 Anne, against the vendors and users of covered buttons. In 1791, a tailor was convicted in a penalty of 40 shillings a dozen for setting covered buttons on a gentleman's waistcoat, and the wearer in like penalty for appearing in a garment thus adorned. General action was taken against offenders by the master and journeymen button makers of Sheffield, as late as 1802, but the magistrates gave so little encouragement to these prosecutions that the law, though it long remained unrepealed, fell from that time into desuetude. —Athenaeum.

—We were most pleasantly surprised by the receipt of the Canadian Journal of Fabrics as our first exchange copy, and the goodwill it expresses towards the Dyers' Bulletin. The journal is a monthly devoted to the textile trades of Canada, of about the size of our paper, which opens to us a field of information on the textile industries not only of our northern neighbors, but on those of other portions of the British Empire, that was not yet accessible for us, in a more direct way than through the mediation of Continental exchanges, and presented from a different point of view. It is now in its eighteenth year, embodying in its appearance and large advertising patronage the motto—Progress. It is published by Biggar, Samuel & Co., at Toronto and Montreal, and costs only $1 annual subscription.—Dyers' Bulletin, Philadelphia.

## Opinions of the Press

### CHART OF THE METRIC SYSTEM.

The publishers have received many letters complimenting them on the issue of the popular Chart of the Metric System of weights and measures. The following are a few sample opinions:

I have very much pleasure in seeing you step to the aid of those pressing the Metric System to the front. I shall be glad to call the attention of teachers to your chart. The Metric System has for a number of years—since I came into office—been taught in all the schools of the province; and the metric measures are those called for in the returns from all our high schools—dimensions of school rooms, etc. I have much pleasure in sending you a few copies of my brochure on the "Three Great Reforms," in which it will be seen that for a number of years I had been an advocate of the system—even in the conservative city of Toronto. Wishing you much success.—A. H. Mackay, Superintendent of Education, Nova Scotia.

I am in receipt of your favor of the 7th ult., together with a copy of The Canadian Engineer for June, and a specimen of the Chart of the Metric System prepared by your firm. I am very pleased to read your article, but I wish particularly to compliment you on the chart. It is, I believe, the best I have seen for explaining briefly the principles of the Metric System. It will afford my committee much pleasure to hear of this awakening interest in Canada. Australia too is showing a growing disposition to adopt Decimal Coinage and Metric Weights and Measures, and here we keep gaining a step month by month.—E. Johnson, Secretary Decimal Association, London, Eng.

We see that you, too, advocate the general adoption of the Metric System of weights and measures, and we believe that as much as possible everywhere the same means should be employed to accomplish the desired aim. The widest possible distribution of your chart would no doubt be a good step forward. We request you therefore to forward to us two copies for our office and for the library of the American Society of Dyers.—L. M. Carriat, Philadelphia.

The Monetary Times has a review of your Chart of the Metric System. I notice the price is stated at ten cents per copy, but if you have any other more expensive editions printed, I should be glad to receive a copy or two; as it is my intention to frame a copy (if possible), and present it to the library of the society of which I am an associate, viz., the Incorporated Accountants (Eng.). It is high time that British traders and accountants awoke to the necessity of adopting decimal coinage and measures. Enclosed please find $1 (Canadian), to cover your expenses for as many copies as the remittance will pay for. Trusting you will be able to assist our efforts on this side to foster "intercolonial and home-country" trade, and lessen the tide of German competition, which is a danger to all the English-speaking countries, if Germany gets the upper hand (both politically and socially), and assuring you of the awakening of the British to their surrounding dangers of subsidized continental competition.—E. Woodroffe, 121 Stapleton Hall Road, Stroud Green, London, England.

Please accept my thanks for the Metric System Charts. The adoption of the Metric System must shortly take place, as everything is to be said for it and next to nothing against it. As to the chart, I consider it is a valuable one, and one which every progressive citizen ought to have in his home. The mass of information, which it explains, is handled in such a simple manner that anybody can understand it without becoming in the least confused as to the use of the different terms, which is the only drawback, that I know of, to the Metric System. There is no doubt though that, if the system were adopted, the terms would be abbreviated to suit the rapid business methods this side of the Atlantic. I expect that a number of people, to whom I have shown the chart, will be calling upon you for copies of it ere long, as they have already expressed intentions of doing so.—Dermot McEvoy, Mechanical Engineer.

A threatened strike among the operators of the Fall River, Mass., mills for an advance of 5 per cent. in wages, has been postponed for two weeks.

The body of Patrick Dewar, an employee of the Merritton Cotton Mills, was found below the cliff at Niagara, on October 6th, with a deep gash in the head. He had left home the day before for the Pan-American, and is supposed to have fallen over the cliff, a height of 80 feet.

—F. E. Atteaux & Co., Toronto, have put on the market a new product called "Filemol;" especially prepared as a softener for vegetable fibres and capable of being worked in the dyebath without retarding the deposition or formation of color on the fibre. The manufacturers claim that when used on union goods it will not affect the color of the wool, but will improve the cotton; on raw cotton, long chain warps or pieces, dyed with materials that produce a harsh "feel," its softening influence is very marked, and that it prevents the formation of electricity.

The Sea Moss Carpet Company, with a capital of $50,000, headquarters at Fraserville, Que., has been incorporated to carry on a general business in sea moss.