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CANADIAN Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XV.

TORONTO AND MONTREAL, OCTOBER 1898.

No. 10.

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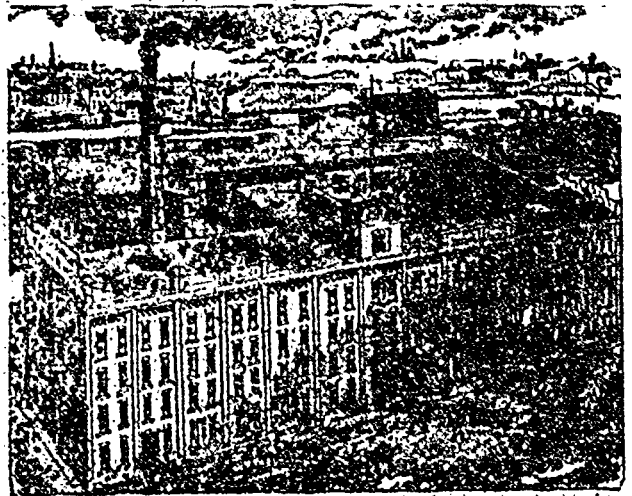
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CANADIAN JOURNAL OF Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XV.

TORONTO AND MONTREAL, OCTOBER, 1898

No. 10.

Canadian Journal of Fabrics

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

Subscription—Canada and United States, \$1.00 per year; Great Britain, 5s; Advertising rates on application.

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

BIGGAR, SAMUEL & CO. PUBLISHERS.

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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.

THE CANADIAN TEXTILE DIRECTORY

A Handbook of all the Cotton, Woolen and other Textile manufactures of Canada, with lists of manufacturers, agents and the wholesale and retail dry goods and kindred trades of the Dominion, to which is appended a vast amount of valuable statistics relating to these trades. Fourth edition now in hand.

Price, on and after publication, \$3.00. Subscribers ordering in advance are given a discount of \$1.00.

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Editorial.

PATTERNS AND PRICES.

Many of our Canadian manufacturers are too stay-at-home in their habits. Even when they do go abroad it is either with too good an opinion of what they have left behind them to desire new ideas or with too humble an opinion of themselves and their means to believe that they can take home what they see abroad. We want more adaptability among our manufacturers. We want our old firms to show us new patterns. Of course there may be too great activity in picking up points abroad, as we are

reminded by the story of the mill which surprised the trade with samples of unusual excellence—which were imported from Great Britain. But novelty must be had just as quality must be had. The days when certain patterns could be counted on as standard are gone completely. Every farm house and logger's shanty in Canada receives its paper, monthly, weekly or daily as it may be, and none can escape the catalogues of the departmental stores. Then, if even the poorest and most remote know what is the prevailing fashion in the centres of light and learning, what is the use of turning out year after year sheets of patterns that are hopelessly "out" and that can only bring orders through furious price-cutting or from buyers who scent the return to power of a long discarded favorite. These things are being done every day in our mills. Our attention is called from time to time to goods of excellent quality that should find a profitable market, but fail to do so save on the "cut and come again" principle.

CLOAK AND CLOTHING MANUFACTURERS.

A short time ago S. F. McKinnon, the Toronto merchant, and F. Buchanan of the Empire Cloak Company, had interviews with Sir Wilfrid Laurier and Sir Richard Cartwright in regard to the suggestion of an American trade paper that Canadian cloths be admitted in the States in bond to be manufactured into ladies' cloaks, and sent back duty free into Canada. The cloak-making business in Canada, Mr. McKinnon says, is so far as wages and conditions of labor are concerned a far better one than in the States, where the foulest sort of sweating is practised and the Jews have forced wages down very low. Piece-work prices are higher in Toronto, in some sorts of work 50 per cent. higher, he states, and girls can make \$10, \$12 and some experts as much as \$16 a week. It is unfortunate that the evidence submitted by these gentlemen to the Government was not available when W. L. M. King was making his researches into the condition of the clothing trade in Toronto. Mr. King states the average wages paid in a number of lines, even going into minute matters such as price of thread, the cost of button holes, etc., and his figures are just about one-quarter of those submitted by the manufacturers. Mr. McKinnon says cloak makers earn \$10, \$12 and \$16 a week. Mr. King says that clothing makers earn \$2.50, \$3 and \$4 a week. But now the work is nominally different, military and post-office uniforms are the subject of Mr. King's enquiries, while mantles are the subject of the manufacturers' evidence. Now there

can be no such difference in the two classes of work. The women who run the fancy stitching and braiding machines may earn much more than the women who make military tunics, but there the divergence ceases. The work is practically of the same quality on the average and we are face to face with a problem. Do the cloak manufacturers pay an average of four times what the labor they employ is worth, or do the Government clothing contractors and their sub contractors, who also in some cases work for the cloak manufacturers, we believe, pay one-quarter of what their laborers really earn? Or again, is Mr. McKinnon, one of the most acute business men in Canada, mistaken in the facts of the case, or is Mr. King, a trained economist, who has distinguished himself in both Canadian and United States universities, mistaken as to his facts? We should like some assistance in clearing this up.

HOW TO BE IN IT.

An incident of general interest to the manufacturers of, and dealers in, textile fabrics throughout Canada will be the publication of the fourth edition of the Canadian Textile Directory, which is now rapidly going through the press. This work is more than a mere directory of names. It gives facts and figures about the textile trades of Canada which have been attempted in no other work. It contains not only a list of all the general stores, retail dry goods dealers, hat and fur dealers, clothiers and haberdashers, tailors, milliners, etc., but all the wholesalers and commission merchants or manufacturers' agents in similar lines, and all the mills and factories engaged in manufacturing fabrics of all kinds connected with the textile and kindred trades. These will be found specified in the advertisement on page 314, and by referring to that it will be seen that it gives information of special value relating to the capacity, products, sale agencies, and other facts of interest to those seeking information concerning the mills. The publishers desire completeness above all things, and a great amount of money, time and correspondence have been spent to obtain this completeness. Considering that all this information is of most benefit to the manufacturers and dealers themselves, one would think that not a single dealer or manufacturer in the country would fail to report promptly, seeing that it is of more importance to themselves than to the publishers. Yet there are a few who have been thus negligent or forgetful. If this touches any reader of this notice will he look up the announcement elsewhere and send in his report at once, as the work will soon be issued. As an advertising medium the Canadian Textile Directory is unequalled. The cream of the manufacturers and dealers in every line we represent are the most prominent users of space in this work. Every copy goes to the trade and counts in influence because it is a standard work. The first edition contained 318 pages; this edition will make a book of over 500 pages. It is the only work in Canada which gives a full list of the boards of trade, travelers' associations, and dry goods and kindred associations, while the immense amount of statistical information, such as the details of the imports and exports of dry goods, etc., the tariff of Canada, the United States

and Newfoundland, sterling exchange rates, etc., make it indispensable in any office of any pretensions.

The price of the book to non-subscribers is \$3, to subscribers \$2, and the advertising rates are as follows: One page (4½ x 7 in.), \$25; one-half page, \$15; one-third page, \$10; one quarter page, \$8; one-sixth page, \$6; ten lines in classified list, \$5. Address at once,

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Fraser Building, Montreal, or 62 Church st., Toronto

SOUTHERN COTTON MILLS AND COTTON MANUFACTURING.*

EDWARD B. WILBER, NEWBERRY, S.C.

Very much of that written concerning manufacturing in the South has been largely exaggerated, for which there is no excuse. What are the advantages we hear so much of, and do they exist to the extent claimed for them by many writers? First is the cost of construction and equipment. Brick mills of the best material and all modern conveniences, having been erected at a cost ranging from 40 cents to 50 cents per square foot, and at a total cost of construction and equipment ranging from \$17 to \$20 per spindle, local conditions having been somewhat unfavorable, together with the fact that the machinery cost ten per cent. more than it would in New England. A number of the above mentioned mills were equipped with the latest up-to-date machinery for about \$14.25 a spindle, which is higher than the same would have cost at railroad centres in New England. Town taxes in North Carolina and South Carolina average one-half of 1 per cent.; city taxes average three-quarters of 1 per cent.; Georgia and Alabama taxes may by vote be remitted for a term of ten years. In Arkansas the aggregate taxes cannot exceed 2 per cent. for town, county, state and school.

Pocohontas coal costs the North Carolina mills \$3.25 per ton, while Tennessee coal is delivered at \$2.95 per ton. In South Carolina Pocohontas coal costs \$3.75 per ton, while Tennessee coal can be secured from \$2.80 to \$3.20 per ton. Georgia uses Tennessee generally, costing \$1.90 to \$2.10 per ton. In Alabama coal costs from \$1.15 to \$1.35, and it is stated one Alabama mill is using local coal, which costs from 75 to 90 cents per ton. The development of water power for cotton manufacturing in the South will not be carried on to any great extent in the future, as steam is proving itself much more reliable and fully as economical. If electricity is to become very much of a factor, then this statement will need to be modified. Southern manufacturers have by experience learned that the actual cost of their water power is only to be arrived at when compared to the relative earning power of a steam plant and a water power plant of equal capacity; and experience has demonstrated that water power is cheaper only under favorable conditions. A 25,000-spindle mill can be built in the South, we will say, for \$18 per spindle. Its fuel for a 1,300 horse-power engine will cost \$18,000 per annum, which is \$13.84 per horse power per year. The most recently built water power mill of that size constructed at cost of \$25 per spindle, required an

*From a paper read before the New England Cotton Manufacturers' Association

investment of \$250,000 in developing the water power; this large investment earned only what it saved, viz., \$25,000, or 7 2-10 per cent. The general opinion is that the southern water power is, as has been demonstrated in New England, very much over-rated, and only under the most favorable conditions is it at all to be compared to a modern economical engine and cheap fuel; probably \$15 per horse power is a safe estimate for the average southern mill using water power. Steam power will cost from \$12 to \$14 per horse power per year, according to favorable or unfavorable conditions.

COST OF MANUFACTURING

Proportionate elements of cost for 40-inch 2 60 cloth	
Raw material.....	61 38 per cent.
Labor.....	15.09 "
Fuel and fixed charges.....	13.61 "
Commissions, discounts, etc.....	9.92 "
	100 "

The following table will indicate the proportionate cost of incidentals, etc.:

Fuel cost.....	18 10 per cent.
Supplies.....	17 11 "
Freight charges on finished goods.....	7 00 "
Repairs.....	9 58 "
Salaries.....	10.34 "
Real estate.....	2.67 "
Insurance and taxes.....	4.93 "
Interest and commissions.....	30.27 "
	100. "

These last figures represent the yearly charges of a steam power plant doing a business of \$700,000.

AVERAGE WAGES PAID PER DAY IN THE FOUR STATES WHICH COMPLETE WITH NEW ENGLAND

	Georgia.	N. C.	S. C.	Alabama.
Picker hands.....	75 cts.	68 cts.	65 cts.	60 cts.
Card hands.....	95 "	80 "	85 "	72 "
Speeder hands.....	90 "	75 "	78 "	80 "
Spinner hands.....	75 "	65 "	56 "	54 "
Spooler hands.....	90 "	78 "	78 "	60 "
Weaver hands.....	100 "	85 "	90 "	90 "
Yard and general help hands.....	70 "	68 "	65 "	60 "

The above table will come very near the average wages in the four States. They are, without doubt, slight variations from the figures given, but not of sufficient extent to alter the general average. The hours of labor vary in the above four States, fully as much as the wages paid.

The best southern mills on print goods with common looms, will have an advantage of two cents per pound over the New England mills using similar machinery. We frequently read in southern papers of the South's advantage of cheap cotton, estimated from one-half cent to three-quarters of a cent a pound; these writers fail to remember that a large proportion of the goods manufactured in the South are first sent to New England for finishing and then possibly returned to New York for distribution, thereby losing the advantage gained on the low-priced cotton. A mill producing coarse goods will generally use local cottons, and may thereby have this advantage of one-half cent to three-quarter a cent a pound. But suppose the character of the goods demands a better cotton than is

found in the near locality; for instance, if cotton has to be freighted from Arkansas or Tennessee to South Carolina, this advantage would nearly disappear, and if the freight charges on finished goods to New England be added to its cost, the southern mill is then laboring under a disadvantage. I fail to see any climatic restrictions whatever of No. 40s and under, not being spun and successfully woven in any part of the South, and when the time comes, as it will, for spinning finer numbers, I apprehend artificial conditions, suitable for such manipulations, will be possible; this has been the experience in the East India mills, where the excessive heat of summer gives way to artificial conditions within the factory. For ten years the South should make but little effort to spin fine as No. 40s, simply because the help will not have had sufficient experience. Meanwhile there will be little need of the South undertaking to spin finer numbers, as there will be no demand for it; but on print cloth numbers the help will during this time develop dexterity not excelled by any class of operatives, foreign or native. That the South will in ten years from now produce with its native operatives the bulk of seven-yard standard print goods there can be no question; when this assertion is denied we thereby acknowledge that the French Canadians, Poles, Russian-Jews and Portuguese, who are now being introduced into New England mills, will accomplish more and have a higher mental make-up than those who are natives and are acquainted with our customs and ideas.

Dog day weather, so-called, has no terrors for the southern spinner, even without the use of humidifiers; with their use, however, the help labor with much less fatigue, not so much from better running work, as from being in a more healthful atmosphere; one singular fact is that we seldom hear of heat prostrations, either from outside or inside labor; this condition, I really believe, gives an advantage to the southern manufacturer not possessed by those in other sections, and is accountable for the continued vitality of our operatives during the severe heated term. We may be asked to explain why it is that so many more hands are required in a southern mill than in a New England one. In weaving departments our southern help will manage successfully as many looms as in any cotton manufacturing country; in spinning and card departments this is not always the case and is to be expected when one considers the length of time our help have been in the mill; some mills are compelled by circumstances over which they cannot exercise control, to give employment to children of rather tender years. This is the only class of southern help which are not considered economical, and this is a difficulty which will in time adjust itself. One will always find in southern cotton mills a far greater proportion of young persons than will be seen in a New England mill; for instance, on drawing machinery and around cards, boys of 14 and 18 years are used, when in northern mills help of not less than 18 years and upward will be found around such machinery. With these few exceptions, hand for hand, we obtain from each operative fully as satisfactory results in the run of a year as are obtained elsewhere.

The following table of 1896 indicates the proportion of persons employed in Massachusetts and North Carolina cotton mills, and will probably represent the South in general as well as in Massachusetts:

	Mass	N C
Men employed.....	43 6-10 p c	29 1-10 p c.
Women employed	50 6-10 "	25 "
Children employed.....	5 8-10 "	25 8-10 "

We see no cause for questioning the continued existence of our present supply of operatives, at least not for the next dozen years. That the colored race can ever be made a cotton-mill operative I most emphatically question and I regard all efforts in that direction as certain to result in financial disaster to the parties interested. There are advantages which the New England manufacturer now has over competitors, that will ultimately be gained by the latter, viz., his greater experience in the economies of mill construction, equipment and management, his abundant capital, and his ability to secure whatever money he may be called upon to borrow, at 2 per cent. or 3 per cent. less interest charges. His nearness to all necessary supplies and repairs, and the comparative low rate of freight charges from the mill to the dyeing, bleaching, printing and finishing establishments, and at this stage the ability to dispose of his goods on a commission, often one-tenth what it costs the southern manufacturer, I would estimate the present net advantages of white cloth mills in Georgia and Alabama at 30 per cent. divided as follows: 10 per cent. for longer hours and new machinery; 20 per cent. for cheaper fuel, lower labor costs, lower taxes and cheaper cotton. I would rate these items as the maximum for mills constructed during the past five years, and not in all of those, for local conditions must always be taken into consideration, and these are as apt to upset our calculations South as elsewhere; for white cloth mills throughout the South which have been constructed over five years, it is doubtful if their present net advantages would reach 20 per cent. There are manufacturers in Georgia who do not admit or either consider that they have any advantage whatever over the New England manufacturer; yet we never learn of the conditions in Georgia as being considered unfavorable to cotton manufacturing, but rather the reverse.

That cotton manufacture of medium and coarse numbers must come South is as certain as fate, and the constant changes West and South of New England's iron, leather and furniture industries, which have been going on for a dozen years, and from much the same causes as now exist in the cotton industries of New England, would seem to prove the changes natural rather than otherwise. Evidently what this country needs at present at least is a complete cessation of all mill building, and an opportunity given for Fall River to recover from its Rip Van Winkle condition. The constant and reiterated statement that the present low price of print goods is caused wholly by southern competition will not bear examination unless we are prepared to admit that 5,000 southern print cloth looms, producing 40,000 pieces per week of 28 inches—64x64 7-yard goods, govern the price at Fall River of

230,000 pieces similar goods produced on 32,000 looms. It is probably due to the longer hours and large number of mills on print goods in New England outside of Massachusetts. The actual danger of southern competition to Massachusetts mills on print goods is not yet present, but near at hand. For causes of the present general depression we must look elsewhere, and when we compare our annual export of \$20,000,000 worth of cotton goods with England's \$330,000,000 worth, we can but believe it is our lack of enterprise in not securing a share of these foreign markets; while we now manufacture 90 per cent. of what cotton goods we need, we must not only manufacture the other 10 per cent., but get our full share of what the other fellow is doing. This will be brought about as soon as our New England competitors realize the absolute need of a change of methods in disposing of their productions. Those mills in Fall River who paid 3 per cent., and New Bedford who paid 7 per cent. dividends in 1897, are not in danger of being dismantled at present, but rather indicate that mills on fine numbers have no great difficulty in earning a fair dividend.

When the South has thoroughly learned the economies of cotton manufacturing, and can finish its own goods, as it should and will eventually, then, and not until then, will the competition be such as to cause uneasiness. At present New England is benefited ten and a half million dollars which the southern cotton manufacturers pay for the finishing of their goods, while the railways are recipients of three and one-half millions from the same sources on freight charges to New England, which kept in the South would annually add 600,000 new spindles. For some unaccountable reason there has previously existed a disposition to value southern manufactured goods lower than those from other sections; hitherto this has resulted in a loss to those producing such goods. These values the southern manufacturer is now refusing and is demanding full values with his competitors, and generally is securing what he demands. If the South which produces 60 per cent. of the world's cotton supply and manufactures only one-twentieth of it, should remain stationary so far as an increase of its manufactures is concerned, it would indicate lack of enterprise in so doing. That there has been, however, a phenomenal increase recently of southern cotton manufacturing is indicated by the figures below:

Year.	No. spindles	No. looms	Bales Cotton consumed
1890.....	1,712,930	39,231	573,844
1893.....	2,550,000	54,000	733,701
1894.....	3,023,000	68,000	723,329
1897.....	4,105,667	103,298	1,024,482

Invested capital of 1890 equals \$61,124,096; of 1897 equals \$120,000,000.

—The New York Wool Exchange has decided to discontinue all further operations in wool until a better outlook shall present itself. The Wool Exchange ascribes the cause of its action to the depression in the woolen market, but the opinion is generally held by those outside of the Exchange that the attempt to distribute wool by auction sales in New York, as is done in London, has not proved successful. Boston is the central market for wool in the

United States, and the effort to wrest the supremacy from "The Hub" has apparently proved abortive. The Wool Exchange was incorporated about a year and a half ago, with \$1,000,000 capital.

A NEW METHOD FOR DRYING TEXTILE FABRICS.*

CHARLES H. FISH, DOVER, N.H.

The drying of wet substances by bringing them in contact with steam heated plates, involves the following principles. The rate of flow of heat through a plate from one side to the other varies with the nature of the substance of which the plate is composed, is proportional to the difference in the temperatures of the two sides, and to the area of the plate, and is inversely as the thickness of the plate. These relations may be expressed by the formula $H = \frac{Ak}{c}(T_1^o - T_2^o)$, in which H equals the amount of heat, or number of heat units, flowing through a plate of the area A and thickness c, in the time t, one side of the plate being maintained at the temperature T_1^o and the other at T_2^o ; and k is a coefficient, the value of which varies with the nature of the material of which the plate is composed; k is defined as the amount of heat flowing through a plate of unit area and unit thickness in a unit of time, the two surfaces of the plate being maintained at a unit's difference in temperature.

This formula, of course, assumes that the surfaces of the plate are clean and bright and that the plate itself is composed of a perfectly uniform substance. In practice it is found that, owing to their being dull and corroded, there is a further resistance to the passage of heat, met at the two surfaces. As a plate has necessarily two surfaces regardless of its thickness, what we may call the surface resistance, is the same for different thickness of plates. If the nature of these surfaces is such that this resistance is large, it may be seen that the thickness of the plate, and even its material may become unimportant factors. Experiments show that this is often the case.

The important and practically the controlling factor is the difference in temperature between the two sides of the plate, the inside and outside. As the inside temperature is dependent entirely upon the temperature of the steam, which in the case of dry cans as usually constructed, can be varied only within a limited range and then without great economy, we naturally look to the outside surface, which can be and is to a greater or less extent constantly cooled in the process of drying. The more rapid the circulation of the material being dried, the more the temperature is reduced and therefore the greater the difference in temperature between the two surfaces. So it is apparent that in striving to get the best results we should obtain as nearly as possible the above condition. It having been shown that the amount of heat transmitted through a plate is proportional to the difference in the temperatures of the two sides, it is obvious that to dry a certain piece of cloth on a certain heating surface it will take twice the time where the difference in temperature between the two sides is only ten degrees, as where the

difference is twenty degrees. For example, let us take the case of a set of dry cans which use low pressure steam. We will assume five pounds by gauge to be the average pressure of the steam within the cans, and we will consider it to be saturated steam. The temperature of the inside surface of the cans will then be that due to the pressure, or about 227 degrees Fahrenheit. As the water in the cloth is being evaporated at atmospheric pressure, the temperature of the outside of the cans will be 212 degrees for all cans where evaporation is taking place. Our difference in temperature, which is the head under which the heat is flowing through the plate, is 227 degrees - 212 degrees = 15 degrees. If by any means we can double this difference in temperature or this head of heat we will be able to either dry twice as much cloth on the same cans in the same time, or we may dispense with half the cans without decreasing the capacity of the set.

In accomplishing this increase of head we can, of course, increase the temperature inside the can, which involves a higher pressure, or we may lower the boiling point of the water in the cloth by lowering the atmospheric pressure about the cans. The principal objections to raising the pressure of the steam, assuming that the cans are of unlimited strength, are first that it is expensive, and second that it is inefficient as compared with the other method. In mills, print works and bleacheries, where large amounts of cloth are dried there is always a considerable amount of power used, and, as a rule, it is found to be of advantage to utilize the steam for generating the power before it is used for heating and drying. Probably the most successful method is to exhaust steam from all the engines of the plant, into a low pressure system of piping in which a pressure of about ten pounds gauge is maintained, and to take the steam required for drying from this system. In this way a considerable amount of low pressure steam is had at a reasonable cost. The actual cost of the steam per pound may readily be calculated for any case where the data are at hand. To illustrate this, let us take a factory which uses 1,000 h.p. for power, and which requires for drying and other purposes 30,000 pounds of low pressure steam per hour. For the sake of simplicity we will assume that the 1,000 h.p. is developed in one engine. We will adopt a high pressure engine exhausting into a low pressure system at ten pounds back pressure. We must exhaust into this system 30,000 pounds of steam per hour, and it only remains to adopt an initial steam pressure which will enable our engine under these conditions to develop 1,000 h.p. We next must find what it would cost to develop this 1,000 h.p. with the most modern compound or triple expansion condensing engines running under favorable conditions. This cost would include interest on the investment, proper charges for fuel, depreciation, taxes, repairs, supplies, attendance, etc. Against this figure set the corresponding figures for our original simple plant, running with the ten pounds back pressure. The difference in the yearly cost of operating the original plant and that of the assumed plant will give us the annual cost of the low pressure steam, and from this we can obtain the cost per pound.

*From a paper read before the New England Cotton Manufacturers' Association.

In most instances it will be found that the cost of the low pressure steam obtained in this way will be so much lower than the cost of high pressure steam that the use of the latter will not be feasible. Then, again, the value of steam at ten pounds gauge as a heating agent is but little less than that of steam at 100 pounds. Referring to our steam tables, we find that the total heat of saturated steam at ten pounds gauge is 1154.9 B.T.U. The total heat of steam at 100 pounds gauge is 1184.9 B.T.U. Assuming that the drips leave the dry cans at atmospheric pressure, there will be carried away by condensed steam 180.8 B.T.U. per pound of steam. There is available 1184.9—108.8=1004.1 B.T.U. per pound of 100 pound pressure steam and 1154.9—180.8=974.1 B.T.U. per pound of steam at ten pounds pressure. $\frac{974.1}{1004.1} = .97$ or the heating value of steam at ten pounds gauge is 97 per cent. of that of steam at 100 pounds gauge. High pressure steam then has the single important advantage of permitting a greater difference in temperatures and thereby a corresponding smaller amount of heating surface.

Let us now consider briefly the effect of reducing the atmospheric pressure on or about the outside surface while still maintaining a low pressure on the inside. The great advantage was shown which decreasing the boiling point by means of a vacuum about the cans, has over the increasing of the pressure within the cans. It may be seen that as the atmospheric pressure decreases the temperature decreases to a much greater degree. As an extreme, a lowering of the pressure from two pounds to one pound absolute, or in other words, increasing the vacuum from about 26 to 28 inches, gives a decrease of 25.1 degrees, while raising the pressure from 115 to 116 pounds absolute or about 100 to 101 gauge, increases the temperature only 0.64 of one degree.

Let us assume 10 pounds gauge as the average pressure at which low pressure dry cans receive steam, and that the condensed steam leaves the cans at atmospheric pressure. The average pressure within the cans will then be somewhere between 10 pounds and 0 pounds. The pressure probably fluctuates greatly, steam being condensed, lowering the pressure when an increased amount of steam rushing in raises it again. It is assumed for the sake of comparison that the average temperature within the cans is that due to a pressure of five pounds gauge. It may be seen that a vacuum of 28 inches would enable our cans to increase their product to more than eight fold, or to state it differently, the set of cans could be divided into eight equal parts and each part would, when drying in a vacuum of 28 inches, have the full capacity of the original set or cans drying under atmospheric pressure. The resulting advantages are obvious. A large amount of space would be saved, a consideration of considerable importance in many places. Less power would be required. The cost of supplies, such as oil and packing, would be lower, and above all, there would be entire absence of heat or vapors in the room.

Although we cannot claim that vacuum drying would effect a great saving of steam under all circumstances, there is still a margin of profit in its favor. The amount

of steam used for drying is proportional to the number of heat units which must be furnished to heat the water in the cloth up to the boiling point, and to evaporate it at that temperature. Taking the temperature of the cloth as 70 degrees before drying, the heat units required per pound of water which it contains will be 1112.8—38.1=1074.7 for 28 of vacuum, and 1146.6—38.1=1108.5 for atmospheric pressure. This shows a theoretical gain of $\frac{1108.5-1074.7}{1108.5} = 3$ per cent. for 28 inches of vacuum. In places where the amount of steam used for power is large in proportion to the amount of steam used for drying, a desirable indirect saving is possible by the use of a vacuum, as it will permit reducing the pressure of steam in the low pressure piping from say ten pounds to perhaps two pounds gauge. As this pressure acts as a back pressure on the engines, a saving in power steam is effected.

Having satisfied ourselves that there are apparently great advantages to be derived from the application of a vacuum to the drying of textile fabrics, it remains to be shown that a practical application of the theory is feasible, and that there is no serious falling off in the benefits which a theoretical study of the subject has led us to expect. The experiments conducted with this end in view have, on the whole, been satisfactory. The apparatus used consisted of an air-tight chamber enclosing a set of nine 23-inch diameter dry cans, a part of a regular 40-can set. The cloth was admitted and passed out through roller gates so arranged as to allow a continuous passage of the cloth without stopping the machine or breaking the vacuum. A vacuum of upwards of 20 inches was maintained within the chamber by a small vacuum pump, with a jet condenser attached. Different cloths in continuous webs were dried both with and without a vacuum in the chamber, and the results carefully compared. Although the apparatus was in a way crude and unhandy an efficiency of about 65 per cent. of the theoretical results was obtained.

It is to be expected that owing to the conditions of the first two or three cans there will be a slight falling off. Another uncertainty which no doubt had its influence on the final results of the tests, was the question of the dryness of the cloth. Unfortunately the limit of the capacity of the experimental machine was the limit of the speed of the engine which furnished the motive power, and without doubt many of the cloths took more time than was actually necessary in passing through, they coming out as it were over-dry. However this may be the results are thought sufficiently satisfactory to warrant the building of a special vacuum drying machine, the practical working of which I trust may so far bear out the theory that the possibility of an apology, as hinted in the opening of this paper, will be removed.

THE NEW JAPANESE TARIFF.

The following details of the new Japanese tariff schedules which will take effect January 1, 1899, are of interest to the textile trades. These schedules consist of four conventional tariffs established by treaty between

Japan and Great Britain, Germany, France and Austria-Hungary, and a statutory tariff enacted by the Japanese Diet. The present tariff of Japan is based upon conventions and has existed since 1866. It was forced upon Japan by the European nations, which fixed a maximum of 5 per cent. ad valorem on all goods. Within the past few years Japan has induced the European powers to abandon the claims of extra territoriality previously maintained by them in all Oriental countries, and also to concede to her the right to make her own tariff laws, subject, of course, to existing treaty provisions. The articles covered by the conventional tariffs which go into force next January will bear duties averaging slightly less than 10 per cent., while those covered by the statutory tariffs will average somewhat higher, the highest rates being levied upon so-called articles of luxury. Following are the items of the combined new tariffs of interest to the textile trade:

	Per Cent.
Cotton yarns, plain or dyed.....	8
Cotton fabrics, including drills, duck, handkerchiefs in the piece, prints, satens, etc.....	15
Other cotton fabrics mixed with flax, hemp or wool, cotton predominating, not otherwise specified.....	10
Felt hats.....	10
Linen yarns.....	9
Linen fabrics.....	10
Silks, satins and silk and cotton mixtures.....	15
Woolen yarns.....	8
Woolen blankets.....	15
Mousseline de laine, extra or unprinted.....	8½
Mousseline de laine, dyed or printed.....	10
Alpacas.....	10
Other woolen fabrics, pure or mixed.....	10
Raw wool.....	Free.
Raw cotton, waste and spun.....	Free.

GOVERNMENT CONTRACTORS' SWEATSHOPS.

The clothing manufacturer is subject to peculiar temptation in the matter of getting the most that he can for his money in the labor market. The supply of labor is almost unlimited. Every day misfortune increases the army of women who are anxious to eke out their living by sewing, and the clothier can hardly be blamed for giving them employment and for paying them only so much as they are willing to work for. The system of sub-contracting, however, is attended with many hardships and the labor employed by the sub-contractors is very badly paid in most cases. The Postmaster-General, Hon. Wm. Mulock, has caused an investigation to be made into the methods followed by the contractors for Government supplies of clothing, to ascertain to what extent the practice of sweating prevailed. W. L. Mackenzie King, M. A., LL.B., has completed the report which he was instructed to make, and it has been embodied in a return ordered by Parliament. The following is the summary of the conclusions of the investigation, with which the return closes:

1. Practically all of the clothing manufactured for the government of Canada, under the contract system of the past ten

years, has been manufactured for the most part on premises other than those of the government contractors, and according to one of the three modes of sub-contracting already described. As a result of this the government contractors have had no immediate supervision of the contract work, and have, in fact, only assumed a partial responsibility for the method and condition under which it was performed. In other words, the contractors, while reaping the benefits of the contract in question, have failed to discharge adequately the duties and responsibilities which may not unfairly be regarded as appertaining to the proper carrying out of their obligations.

2. Most of the work on government clothing has really been executed by women and girls. Where these have been employed in shops their wages have been, on the whole, exceedingly low; and where the work was performed in homes, the prices paid were often such as to necessitate long hours of labor for a very meagre return. In the case of those employed by sub-contractors the general rule has been to require a maximum amount of work for a minimum amount of pay. Exceptionally long hours and other objectionable features have marked the course of employment of the workers in the homes, and of not a few in the shops.

3. The introduction of a sub-contractor, who resorts to hired help, has involved the necessity of realizing a double profit out of the work of the hands, and as a consequence of this, and the competition of sub-contractors, the wages of the large majority of those engaged on government work have suffered a considerable depression. The wages received will not bear comparison other than unfavorable with those paid as a fair return for labor in other trades or occupations.

4. The conditions under which much of the government work has been executed have been such as to prove injurious to the health and well-being of those engaged in it. There has been no proper or adequate inspection of the methods or the work itself, and, as a consequence, individuals, and the public alike, have been exposed to continuous risk from the spread of contagion as well as to harm in other ways.

I need scarcely add that the existence of such conditions, apart from any other attendant evils of the sweating system, constitute emphatically, in the words of your communication, "sufficient grounds for government interference in order that future contracts may be performed in a manner free from all such objectionable features." The step in this direction which has already been taken by your department cannot fail to bring about a much needed reform and be productive of great and lasting good to the industrial classes of this country.

WORSTED SPINNING.

BY M. M. BUCKLEY.

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(Continued from last issue).

The character and properties of the wool must determine the course of treatment to be adopted. Sometimes, for instance, the overlooker may receive a blend of tops composed of short, tender, mushy wool, whose fibers possess very little drawing or resisting power. On the other hand, the blend may be of good length, soft to the handle, strong in the fiber, and possessing a good draw. These opposite features require a different system of manipulation. In the first instance, the short, tender wool will not bear much strain, and must therefore be worked with very short drafts and ratches. The carriers should be set close to the front rollers, and

heavy top carriers used, so as to prevent the twist being forced out. The slivers will also require more than the usual amount of twist, in order to give them the necessary strength to bear the strain caused by winding on to the bobbin. This is the frequent cause of many bad rovings and lean yarns, owing to the roving being wound on to the barrel too tightly, with a view to getting a long length on to the bobbin. On the other hand, in the case of a good sound top, with plenty of resistance, the best results will be obtained by working with a free ratch, full draft, open carriers, with light ones on the top, medium twist, and a light drag. The draft is perhaps the most important feature in this process, and admits of no haphazard procedure, yet a thorough knowledge of it can only be obtained by prolonged observations and comparisons. Upon first receipt of the blend of tops each should be carefully examined, and its length, strength, and other features compared, so as to decide as to what amount of draft is best suited, and observe the result. A draft suitable for one class of top would utterly ruin another. Yet no rigid method can be laid down. The longer the draft the straighter the sliver will be. If, however, it be overdone, we are in danger of producing a twitty end. Some overlookers adopt the length of the wool as a basis in arranging their drafts; thus in a wool of 6 inches long, their maximum would be 6. It is always advisable to have the draft shorter in the gill boxes than in the drawers, because the slivers are in a flat, untwisted state, and less able to bear the strain. After the ends have been twisted up two or three times and reduced in thickness, they will bear a longer draft, owing to each fiber having received a certain amount of twist. This may be proved to a certain extent by taking a box and observing the amount of twist required with the spindles running in the proper direction. Then reverse them so as to twine the opposite way, and note the increase required to yield the same result, or breaking strain. Others take as their basis for drafting the length of the ratches, putting a half or one more on, as their judgment dictates. The drag of the bobbins is another point which must not be ignored, especially in the case of open drawing. Here the speed of the bobbin is controlled by means of washers, made generally either of leather or woven felt. Various sizes are adopted, according to the bobbins it is required to regulate. At the outset it must be said that the tension placed on the end ought in no case to be excessive, but just sufficient to prevent the bobbin overrunning the end. In order to reduce the strain upon the ends as they leave the nip of the front roller, they are wrapped two or three times around the wing of the flyer. The hands who attend the machines require constant watching with regard to this, because if the ends get a little troublesome they frequently take a wrap or two off, thus putting the stress on the end at the top of the flyer, where it is least able to bear it, as at this point it is practically without

twist and not able to resist the continuous pull of the washers.

Having indicated the general features which require attention, we are now in a position to consider the machines employed. In open sets the first machine is usually a double-can gill box with creel attached, which consists of a series of wood or galvanized tin rollers driven by means of chains. Upon these the tops, as received from the comber, are placed, being kept separate and in position by iron plates. The speed of the rollers is arranged so as to feed the back rollers of the gill box, the tops being unwound from the outside. The construction of the box and the arrangement of its parts are similar to those described when we dealt with preparing, the driving of the rollers also being the same. The rules given for calculating drafts and speeds apply here as well. Usually six to eight tops are put up each side, and after passing through the back rollers encounter the fallers, which are made of steel and pinned through with two rows of pins projecting about 7-8 and 1 inch. For the first and second boxes about 14 pins per inch are sufficient. Opinions differ considerably as to the number of fallers necessary, some using 16, others 24 or 27, the latter having the advantage that the wear and tear is not as great as when less are used. It is essential that the wool be well in the pin, but not too tight, or the front rollers, when drafting, will jerk it and cause the ends to be irregular; on the other hand, if too slack there is a danger of the fibers being drawn over the pins, which is equally as bad. If the pins are too fine or long they are readily broken, and often become embedded in the leathers or rollers, and have a tendency either to cut the fibers or hook the wool, and cause laps which may spoil the leathers or fallers, besides causing a large amount of waste and loss of time.

In the drawing gill boxes the faller screws are best when made with double hammers and separate threads. It increases the life of both the screws and fallers, and allows of them being run at a much higher speed, since two fallers drop at each revolution. The faller pins require regular attention, as if they get broken and bent at each traverse they gather a few fibers which, by accumulating, lift the slivers in the gills and cause bad places. The gill leathers which work on the front rollers must be perfectly even and free from thin and weak places, or they will affect the ends. At this box the cans should all be weighed as they are doffed, and averaged into sets ready for the next machine.

(To be continued).

THE GROWING DEMAND FOR TAPESTRIES.

Interest in tapestry is becoming more and more pronounced. Architects urge its use in the superb homes which are being built throughout America and dealers are frantically scouring Europe for a supply to satisfy the increasing demand.

Antique tapestries are, however, rare in the market, and even the men who are willing to spend enormous sums of

money are, in most cases, obliged to content themselves with modern tapestry. There was a time, at the beginning of this century, when the tapestry weaver's art had fallen into disrepute and antique tapestries were not highly esteemed. Specimens which to-day would bring fabulous prices were relegated to garrets and storerooms. Few of the manufactories which had in their time been world famous were in operation, and the few which, like the Gobelins, did struggle on, barely existed.

The day of shoddy display had come, and paper hangings, woven stuffs, and other cheap substitutes took the place occupied for centuries by tapestries. In recent years a reaction has set in, and men of wealth and taste have begun to appreciate the art value of the old tapestry. European families lucky enough to possess tapestries make much of them, and Americans give much for them. Several very valuable pieces have found their way into American museums, but the most valuable tapestries are in the possession of private collectors.

There are fine private collections of tapestry in France and England, and most of the great museums of Europe own valuable tapestries, the Garde Meuble in Paris and the Royal Palace at Madrid being particularly rich in this line. Many of the most noted tapestries in existence are the property of cathedrals and churches. The two oldest pieces of tapestry extant are in the cathedral of Halberstadt in Germany, and they do not date back further than the end of the twelfth century, although records show that the art of tapestry weaving had reached a high degree of perfection even in ancient Egyptian and Babylonian times. Another twelfth century tapestry hung in the Church of St. Geron in Cologne; but it was divided into three parts and the fragments were sold to the museums of Lyons, Nuremberg, and Kensington. Only one authentic thirteenth century tapestry is known to exist, and that hangs in the German Abbey of Inedlinburg.

With the fourteenth century came the rise of great French and Flemish tapestry makers at Paris, Arras, and Brussels, and from that time the admiration of tapestry became a mania throughout Europe. The Arazzi, or tapestries made at Arras, were considered the most precious, on account of their superiority in dyes and fabrics, and they were the most conspicuous feature of every splendid celebration. Coronations, tournaments, banquets, triumphs were made gorgeous by a wealth of brilliant hued tapestry. Tapestries were the most prized treasures of powerful monarchs, the most esteemed royal gifts. Thousands of workmen were employed in the workshops, the master weavers received large salaries, and immense prices were paid for the tapestries. Tapestry works sprang up all over Europe, master weavers being procured from Flanders and Northern France, which still kept the lead. Italy attained a great reputation for the painting of cartoons, and furnished Flanders with designs, while Flanders supplied Italy with workmen. Francis I., Charles V., Leo X., the Doges of Venice, the Medicis of Florence, the Church chapters, the municipalities—all engaged in mad rivalry over the possession of tapestries and were willing to pay almost any price. Leo X. paid Raphael £2,000 for the cartoons of the famous "Acts of the Apostles," a set of ten tapestries. The execution of the tapestries cost him £30,000 more, and the purchasing power of money in that time was four or five times what it is to-day.

These tapestries were made at Brussels, for the factories of Arras were ruined when the inhabitants of that town were expelled in 1477. At the death of Pope Leo the series was pawned for £10,000. During the sack of Rome several pieces were stolen, but later the Vatican once more obtained possession of them. When Napoleon's French troops entered Rome the celebrated tapestries were carried to France, but Pius VII. re-acquired them and they are now in the Vatican.

During the seventeenth century Brussels declined and Paris became the chief tapestry centre. The famous Gobelins factory owes its name to a family of dyers that went from Rheims to Paris in the fifteenth century and settled upon the banks of the little river Bievre, the waters of this stream having been found to possess excellent qualities for dyeing, on account of the dissolved vegetable substances which they contained. Later the Gobelins associated with themselves two Flemish master weavers and began the manufacture of tapestry, and, under Louis XIV. and his minister, Colbert, the little atelier was expanded to a Government factory, which became marvellously successful. Since then the factory has always been a Government property, and, though closed at different times on account of financial stringency, it has always been reopened.

During the reign of Louis XV. tapestry changed its character to reflect the spirit of the times. Instead of portraying victories in battle scenes of pomp and power, it devoted itself to Cupids and shepherdesses. Boucher and Watteau were the artists of the day, and while Louis XIV.'s tapestries portrayed his triumphs, Louis XV.'s pictured his pleasures. Some of the new designs were charming, but in their effort to produce delicate effects the artists employed soft and fugitive colors. Where the early weavers had contented themselves with nineteen colors, the eighteenth century men had an assortment of a thousand colors, each subdivided into twelve shades from dark to light. The immediate effect was charming; and though, in a short time, the harmonious color scheme was ruined by the fading of some colors, that consideration had no weight with a society whose motto was "apres nous, le deluge." The deluge came in tapestry as in everything else, and, though the Gobelins factory continued to turn out a limited number of pieces these tapestries were used, as the Gobelins are now, merely for Government purposes, and did not depend upon the taste of a public which had lost all interest in tapestry. Many of the old Gobelins which were presented by the Government to private persons have since come into the market, and to-day they bring very large prices and are steadily increasing in value. Indeed, no other object of art has gained in value so rapidly in recent years as antique tapestry, and those persons who were so fortunate as to obtain valuable specimens at the beginning of the movement in favor of tapestry, have made most profitable investments.

A few ateliers have sprung up lately. In addition to the Gobelins and Beauvais Government factories, France has two private establishments, both at Aubusson, employing together about 100 workers. There are also a few small factories at Neuilly. A factory has recently been opened in Rome, and another has been started in Berlin under the patronage of the Emperor. About twenty years ago an ambitious attempt at tapestry weaving was started at Windsor under the patronage of Queen Victoria. The works were splendidly endowed and commissions were given. A few wealthy Americans, Mr. Cornelius Vanderbilt among the number, sent large orders to the Royal Windsor Tapestry Works, but extravagance in management led to the failure of the enterprise. The British aristocracy decided that it could not keep up a tapestry factory for the glory of England, so contributions ceased and the establishment collapsed. The master workman of the Windsor works went to America, and, with the aid of New York capital, opened a tapestry factory out on the Bronx River, which river, by the way, was found to possess the same qualities that formerly made the River Bievre so valuable to the Gobelins factory. The Bievre has now, however, become so impure that the Gobelins factory is obliged to produce by chemicals the effects which were formerly brought about by the natural properties of the water. French workmen were imported for the American factory and found themselves very much at home in the French colony that clusters along the Bronx. The effort to educate

American weavers and to make the industry native and independent of foreign workmen has met with a serious obstacle in the American dislike of the apprentice system. Tapestry weavers require a high degree of skill, and for the first few years an employee who is a novice is of comparatively little value. In the French Gobelins works boys, in most cases the sons of the workmen, are apprenticed to the trade. The Government gives them a living and an education, and when they become proficient they receive good wages. In America a boy is in too great a hurry to learn a trade first and get wages afterwards, and only through paying good wages from the start has it been possible to obtain American apprentices.

WATER FOR BLEACHING.*

BY C. P. SEYMOUR ROTHWELL, F. C. S.

The amount of silica found in natural waters is so very small, much less than one grain per gallon that it cannot have any appreciable effect upon the results either in bleaching or dyeing; should, however, the amount of silica ever exceed the quantity stated, the water is certainly abnormal and should be very carefully and fully examined. Large quantities of silica in the water do not much affect the results in bleaching but when the goods are to be dyed afterwards with alizarine the results are, according to Charles O'Neill, inferior to what they would be if purer water were used. Alumina will only be found in small quantities in water, and although it is not a desirable ingredient it does not affect the results in so marked a manner as is the case with iron salts. Should the proportion ever be found large the water would be much better if it was removed and this should be done.

Sulphates, existing as the sulphates of lime or magnesia are objectionable in a water used for bleaching, principally from the fact that they destroy the scouring agents, they are certainly far more injurious in a water intended for dyeing many pale shades being rendered considerably inferior by their presence; for the latter purpose, sulphates of these metals are more to be avoided than the corresponding carbonates, as such a water cannot be corrected in the dyehouse so easily, the water containing the carbonates being made suitable for use in most processes by neutralization with acetic acid. It is not possible to give hard and fast rules by which any sample of water can be classed as "good" or "bad," for it is necessary to take into consideration the whole of the results of an analysis regarding the relative proportions in which the various bodies, as well as the actual amount of the substances, are present; hence it has only been possible for us to give a general idea of the points to be taken into consideration in arriving at a proper conclusion from the results of our tests. Supposing we have satisfied ourselves that our water supply does affect our finished results, it will be necessary to either change our source of supply, if such a course is possible, or adopt a method of purification.

The ingredients or impurities present in waters which it is desirable to remove in any system of purification consist of the sulphates and carbonates of lime, magnesia, and iron, and also as much organic matter as possible. The process which is used principally at the present time is the one devised by Dr. Clark many years ago, only slight modifications in the reagents having been introduced by recent experimenters. The principal improvements in the practical working of this process have been in the mechanical appliances devised to simplify its application, and economize space by causing the precipitated substances to subside or deposit more rapidly, or to cause the deposit to fall into convenient receptacles to facilitate its easy removal.

*From the Dyer and Calico Printer.

In Dr. Clark's original process the softening of the water was accomplished by the addition of lime water, or milk of lime, to the water, allowing the precipitated carbonate of lime to settle in large iron tanks. It may seem rather anomalous to one unacquainted with chemistry to attempt to remove lime from water by the addition of more lime, but this is easily understood when it is explained that the lime held in solution by the water, or rather that portion of it which is removed by Clark's process, is only rendered soluble by the presence of an excess of carbonic acid gas forming a so called bicarbonate of lime. The addition of lime water to such a water takes up the excess of carbonic acid, and the lime in the water, as well as the lime which has been added, is precipitated.

The original process is surrounded with many practical difficulties, the principal one being the slowness with which the precipitate of carbonate of lime settles to the bottom of the tanks, which makes it absolutely necessary to use tanks of large size, and several of these must be worked together. Again, the addition of lime-water alone to a hard water will only cause the removal of that portion of the hardness which is known as temporary hardness; hence the water is not completely softened. By Clark's process it will be found that, on the large scale, it will be possible to soften a water of 23 deg. hardness to 7 deg. or one of 15 deg. hardness to 3 deg. or 4 deg.* In working this process on the large scale, it is necessary to ascertain by previous small trials how much lime is required to precipitate the lime in the water. To ascertain this about two to three gallons of the water should be taken and some of the lime-water or milk of lime added, stirred well, and then the water should be tested to see if an excess of lime is present. This can be done by taking a small portion of the water in a clear glass vessel and adding to it a clear decoction of cochineal. Should an excess of lime be present, the cochineal will be turned from yellowish-red to violet. The lime solution should be added, little by little, to the water until an excess of lime can, after stirring some time, just be detected. From this determination the amount of lime solution to add to a tank full of water of known capacity can be calculated, and in practice a little less will be required than is thus found, for we do not want to be able to detect any excess in the treated water. The use of lime-water alone only precipitates the carbonate of lime contained in solution in the water; any sulphate, nitrate, or chloride of lime is not acted upon in a way to cause their precipitation. The corresponding salts of magnesia are precipitated as the hydrate. Hence when the hardness of the water is due to the presence in part of sulphate or chloride of lime, lime-water does not remedy this so-called permanent hardness. The use of a mixture of milk of lime with soda ash will, when added in suitable proportions, cure the hardness due to both the carbonates and the sulphates and other salts in the water. This was the first improvement effected in the original process.

The sodium hydrate would be formed in the mixing of the lime with the carbonate of soda. In addition to these substances the chlorides and nitrates of the same metals would also be acted upon in a similar way to the sulphate of lime and magnesia. Organic matter in the water is to some extent removed when treated by this process; but where its presence is large, or has an injurious action, it is usual to add to the mixture of lime and soda some sulphate of alumina or iron which will cause the organic matter to be precipitated, and also cause the whole of the matter which is thrown out of solution to settle with much more rapidity.

So far we have only dealt with recent improvements in the chemical portion of the Clark process, and alluded to the use of large settling tanks as required in the original process.

Many improvements have been effected in the mechanical methods and appliances for practically carrying out this process, the aim of all the engineers being to separate the softened water from the precipitated impurities in a quicker, yet as efficient, manner than is accomplished by tank treatment. The various methods now used in softening plant to remove the sludge may be divided into three classes; those that employ a filter press, filtration through media, or grating, which will hold some of the deposited matter and form a filtering bed, and methods which depend upon causing the deposited bodies to assume such a physical form or density that they will quickly settle to the bottom of any vessel, leaving the water above perfectly clear. We will describe one form of each type, and in doing so will mention those principally employed at the present time on a large scale. Porter & Sons make several forms of water softening machines, all of which are constructed upon the filtration system. In one form a portion of the water from the reservoir is run through a small cylinder containing lime, and it thus becomes nearly saturated with lime. The lime-water so obtained is allowed to flow into a large cylinder filled with the water, with which it is thoroughly mixed, and the milky water so produced is then run through a filter press, which separates the solid particles and delivers the water perfectly clear and softened. The volume of lime-water allowed to flow into the larger cylinder is regulated according to the hardness of the water that is being treated, and valves are placed in suitable positions so that perfect control can be had over the whole process. The process is thus practically a continuous one, and does not require the attention of skilled labor after the trials to regulate the quantity of lime water needed for any particular water. In another pattern of purifier, by the same makers, the lime is mixed with some of the water in a small tank, and predetermined volumes of this solution are mixed with some more of the water in a larger tank, perfect admixture being attained by the use of mechanical agitators. The water after mixing with the softening agents then flows into a longer tank which is fitted throughout its length with vertically arranged filtering cloths, so that by the time the water arrives at the far end of the tank it has been thoroughly filtered and is fit to be used in the works. The filtering mats are made of cocoanut fibre covered with cloth; the vertical arrangement of these filter mats having the advantage that they can easily be cleaned out, and it is obvious that if they are cleaned one at a time it would not be necessary to stop the machine while this was being done, in addition the process is continuous in its action.

BACKING WOOLEN GOODS.

To successfully put a back on a woolen cloth so as to please all concerned, and do it at a profit, is one of the most difficult things the manufacturer is ever called on to do. All who have to handle a cloth come sooner or later to have a fling at the back. It really comes to be a fact that the back of the fabric is at times almost as important as the face. How often we find goods not selling because the back is wrong. The salesman finds that in some way or other there is disharmony between the back and face, and the goods cannot be disposed of at a profit. Sometimes backs are changed, when little or no change is made in the face, and thus is done in the hope that goods will sell better after the change than before. In every case the important and all-essential thing is to get such a back on the piece as will add to the general effect of the goods without adding unduly to the price.

The most satisfactory and perfect back that can be made on a cloth is the one which obtains where the goods are made, through and through, double cloth, says a writer in a con-

temporary. In this case the back of the piece is exactly the same as the face, the design of the back is just like the design of the face, and the twill, if it is a twilled cloth will run in the opposite direction. So far as the pattern of backs is concerned, the choice is undoubtedly with the designer, and it rests almost entirely with that individual just what the back will be, so long as it harmonizes with the rest of the cloth and carries out the general effect intended and desired. In binding all such backed goods, by far the most certain and satisfactory way to proceed is to bind the face to the back, and not the back to the face. When the back is bound to the face of the goods, and the finishing is complete, it will be seen that the surface and effect on the face of the cloth is much rougher and more uneven than when the face is bound to the back. The latter procedure leaves a face unaffected entirely by the back, a face smooth, even and uniform, because there does not need to be any looping of the filling in the face of the cloth. Next to this way of binding the goods is the plan of binding face and back alternately. Next to this is the doeskin back, which is, in fact, a warp back, and answers fairly well on the worsted variety of goods. This sort of a back on woolen cloths is not a success. The fabric has a rough, coarse look on the back, owing to the fact that the floats are so far apart, and, while the face may appear all right, the loose, raw and ragged look of the back destroys the general attractiveness of the goods. On worsteds, however, the doeskin back looks all right, it has a rich, full appearance, and shows a good value, so far as stock and finish are concerned. In making the doeskin back to the worsted, the procedure is to allow one thread of face to one thread of backing in the warp. The filling is "two" and "one;" that is, two threads of filling on the face to one thread of filling on the back. This arrangement will make the doeskin back on the worsted solid and firm.

Some worsteds are made, like woolens, without any backing pick, and the weight is attained by depending upon the combination of the weight of the warp yarn and the filling, which is sufficient without any backing pick. Another back which is employed on worsteds is a plain back, or a two and one warp and filling. On worsteds this back will call for a twenty-four harness to make it with satisfaction and success, and then the goods will come out with a face that is absolutely all right as to smoothness and beauty of face appearance. It is on account of the binding, as explained above, that harness of this number is required. If the backing is for woolen goods, twelve harness will be quite enough, since binding on woolen face is not as plainly noticeable as upon the face of the worsted.

In all that has gone before, it is implied that the face weave is what is commonly called the cassimere twill. But even though the face weave may be different, the backs described may be handled, if all other things are equal.

In making a back, two considerations, at least, must enter into the question: First, the quality of the goods; and, second, the price which the maker gets for them. These two points, of course, are generally interdependent, but, in handling the goods and the backing to be determined upon, both must be taken into account. On cheap goods a very fine back is, of course, out of place, and there must always be some kind of harmony between face and back. In a fine face cloth a good back adds very materially to its selling qualities, but the back must always be so arranged and so constructed that the face is in no wise disturbed. The idea is that the piece with the back shall have exactly the same face appearance as it would have had it no backing at all. Thus, the face of the double cloth will look exactly as if it were a single cloth. This is the height of the designer's ambition and, with care and study, it can be done, at least it can in most cases.

One of the most important considerations is the size of

the yarn in the backing. It will never do to have too coarse a yarn in the back; a yarn of this description will influence and effect the number of picks in the face, and thus, of course, will alter the whole appearance of the goods, so far as the face is concerned. There must be a degree of natural harmony in the number of picks in back and face, or there will be an unbalanced appearance, which is not desirable. The felting quality of backing yarns must be, to a certain extent, harmonious with that of the face yarns. If the back yarns felt more or less than the yarns of the face there is liable to be a lack of uniformity. This will occur particularly where the difference in felting quality is at all marked.

Foreign Textile Centres

MANCHESTER—In connection with the cotton trade several events of importance have occurred lately. There has been a feeling, rapidly ripening for some time past, to the effect that the indifference shown by local shippers to the canal is a subject for severe criticism. Returns relating to cotton goods shipments from the Mersey recently, show the bulk of the traffic is still in the hands of Liverpool. The efforts to increase consignments by way of the canal have succeeded to a certain extent, but the bulk of the traffic is still by way of Liverpool. The business accomplished so far may to many appear small, but it must be remembered that very serious difficulties are in the way. Vested interests operate to the fullest possible extent, and there are bribes (in the shape of rebates) so powerful that houses of the largest standing allow their influence to operate. Liverpool has been active since the canal was opened. On the other hand, many local shippers have been more indifferent than ever. It is significant that many of these inert opponents of the canal belong to an alien race, though many of them are Britons born. It is a very peculiar condition of affairs to see a waterway, costing in round figures fifteen millions sterling, utilized by a body of traders as a means of exacting blackmail in the shape of rebates. The weight of Manchester cotton shipments is much larger than generally supposed. Marshall Stevens placed the figure some years ago at a thousand tons a day, but the estimate referred to only one class of goods, and is in any case now surpassed. The indifference of the commercial public to the evils dealt with by Mr. Clarke recently, in his pamphlet on "Shipping Rugs and the South African Trade," is proved by the absence of any known efforts to reform the ills. Indifference of a similar character accounts for the slowness with which the efforts of the Manchester Cotton Association appear to progress. Those in charge of the movement are earnest and willing, but there is not the necessary help obtainable locally under existing conditions. The average Manchester shipper would regard any suggestion as to an amalgamation with his neighbors with disdain. On the Baltic and in other centres where London commercial men meet day by day, there is intercourse of the freest character. A shipowner in Newport, Cardiff, Liverpool, Glasgow or Newcastle, wiring to his London brokers to fix a boat, can rely on a satisfactory reply within a comparatively short time. The system is splendid. Here there is an absence of any such feeling. The result is shown in the terrible struggles of the Ship Canal directorate to keep its head above water. In the long run all will come well. There is not much doing on American account. The demand for heavy traffic from the potteries is brisk, and canvassers for the leading steamship companies say that there is a good deal more doing for Canada. The crops in Ontario, Manitoba, and the Northwest territories are very satisfactory. There is a fair trade passing in flannelettes. The demand for silk unions is brisker. "Magpies" (black and white stripes) have been

printed, but they are unions, and the result does not always seem to have been satisfactory. Speaking of silk printing generally, it may be said that the absence of long runs, as far as this country is concerned, prevents producers from going into the trade to any extent. The enquiry for Yorkshire finishes of cotton goods on American account has fallen off lately. In the worsted coating branches there is, however, more doing. The heavy crate traffic from the Staffordshire district has not increased, and although heavy consignments are now forwarded by way of Newport News, the general turnover is below the average. The linen shipments from Liverpool to New York are not up to the ordinary level. To Beyrout, recent consignments on the other hand have been rather above the average. For some time past this fact has been most noticeable to those watching the progress of the Syrian trade. There is not much help to be obtained from local shippers interested in the business.

OLDHAM.—The flat card question in Oldham is far from being settled, says The Oldham Standard, and there is every likelihood of it spreading beyond the confines of the borough. Both sides, of course, contend they are in the right, but so long as they keep apart there is very little prospect of effecting a settlement. As to the merits of the case, where experts differ it is inadvisable for outsiders to interfere; but one may perhaps be permitted to suggest that the operatives should withdraw the notice to the effect that they would not in future be bound by the list. This policy would clear the path for negotiations, and leave the way open for dealing with the subject as a whole. Single revolving flat cards are apparently becoming the recognized machines of the future, and as they are being almost universally adopted, the sooner the question is dealt with the better for both sides.

LEEDS.—The expected improvement in the cloth market has not taken place, and the new business done in worsteds is remarkably small, which is owing to the higher range of prices. Serges and vicunas are in the same position, except that as yet higher quotations for winter samples are not imperative. Makers keep up the production of medium and cheaper sorts. Spring patterns received little attention from the London and other branches of the home trade, but the latest novelties in these goods are very firm at an advance of not less than 10s., while for the best, showing perfection of dyeing and finishing, an advance of 12 per cent. is firmly established. The American and Continental trade, however, is very small. Ordinary meltons are unchanged. Costume and mantle cloths are quiet both for home and export. Stocks are not heavy in any department. Blanket makers are busy, but orders for army cloths are fast running out and renewals are wanted. The settlement of the wages question in the colliery districts by the concession by the masters of an immediate advance of 2½ per cent., has created increased confidence in districts which consume large amounts of Leeds made clothing, and the agricultural districts are also more prosperous than for some time past. In the heavy woollen districts business only improves very slowly, and the late warm weather has postponed the use of heavy cheap woollen goods, as stocks with retailers were heavy on account of last year's mild winter. Business is, however, reported better amongst makers of cheap heavy serges and vicunas, and there is a better demand for mantle cloths. Some makers in this district have, however, suffered a good deal recently from bad debts. There is a better enquiry for some colonial markets, and there is a good business doing in rugs for the Cape. Better class white blankets are now being taken in much more freely by the retailers, and some makers report that their stocks are getting down very satisfactorily. There is also a better enquiry for Yorkshire flannels, and makers are much better employed than was the case a month ago, but they are unfortunately situated

just now as the raw material is much dearer, and any advance for goods is difficult to obtain.

BRADFORD.—The course of prices at the present series of colonial wool sales in London has followed almost exactly the forecast given in this paper in the letter previous to the opening day's sale, and the rise in the values of fine merino wool has ranged from 5 to 7½ per cent. in advance of the rates at the conclusion of the last sales. In the Bradford market, however, the prices of wool and tops of this class had already been advanced to a point at least equal to the rates ruling at the London sales, and as many local authorities had looked for still higher prices in London, the market here for fine merinos has been only quiet, as consumers seem to think that they may be content in only supplying their immediate wants. There has been no giving way in the prices for fine wools; any advances which have been established in either yarn or piece goods are not nearly equal to the rise in raw material. Up to the present the Americans have not been in evidence in London as buyers of the finest colonial wools, and the demand from the States is also still quiet for fine worsted coatings and other soft makes of dress goods, but should serious buying set in from that quarter in any of these departments an improvement in the market must at once ensue. The demand for the lower classes of crossbred wools in London has been extremely languid, and the huge and increasing production of these cheaper wools seems likely to keep this department of the market quiet for the present, but it should be remembered that as the wool growers cannot profitably produce crossbred wools at the present rates, an upward reaction must eventually set in. A certain amount of speculative buying is still reported in pure lustre wool, but this has not, up to the present, affected prices to any appreciable extent, and all other classes of home-grown wools continue in very quiet demand. The mohair market, like that of the fine merino wools, has been quiet during the week, but it is a significant fact that whilst all other classes of wool have during the present year been receding in value, that the quotations of mohair and fine merino have been gradually creeping upward. These two similar movements have, however, been brought about by quite dissimilar causes, for whilst mohair has been forced up by an increased consumption, the prices of fine merino have been mainly influenced by a shortage in the supply. There is all the time a large business being done in mohair yarns, and spinners are not only well employed, but report that new business is coming to hand for both mohair crepon warps and for wefts for plain goods. The prospects for the next spring season continue to point most strongly in the direction of bright dress goods fabrics, and I hear of some good orders for plain mohairs which are in work for the United States and also that plain black mohairs of good quality will be largely sold in the home market. The Bradford coating costume cloths in mixture shades, which had such a good reception last season on account of the unalterable and unspottable finish have, I understand, been bought more than ever for the next spring season, and that although the wool from which these goods are made has greatly advanced in price, only a very fractional advance is being, up to the present, demanded by the manufacturers. Some very handsome styles of lustre crepons in black mohairs are selling well, both for the present time and for the next season's trade, and Bradford is now producing largely these high-class goods at prices which only a few seasons ago were quite unheard of here.

HALIFAX.—The following is contained in the Halifax Chamber of Commerce trade report for September: **Wool.**—The demand for merino and fine crossbreds has been good all through the month. Inferior crossbreds and English wools have only found a slow sale, without any quotable change in prices. **Woolens.**—Owing to the approach of colder weather, there is more business doing, and most manufacturers report

an improvement. **Worsted Yarns.**—There have been a few more orders placed during the month, especially for yarns made from merino and fine crossbred wools. So far, spinners are unable to get anything like a corresponding advance to that which has taken place in the price of tops and wool. **Cotton.**—The fall in raw cotton during the month has brought about business in two-fold 40's and 42's, stocks having been cleared at low figures. **Fustians and Ready-mades.**—Both these industries (particularly the latter) are busier and in a better position than for some time past, full time being again resumed. **Pieces.**—There has been more enquiry during the month for staple goods for foreign markets, and manufacturers are able to quote higher prices for fabrics made from fine wools. Merchants are not so willing to expend, consequently there are very few orders being given, but the trade is healthy all round. **Carpets.**—The demand during this month has only been of a sluggish character, owing to its being between seasons. **Spun Silk.**—There has been some little improvement during the month, but there is no change in prices.

KIDDERMINSTER.—Manufacturers are now turning their attention to the requirements of the coming season. The travelers are preparing for the road, and will be leaving home next week for the various commercial centres. The harvest has been an abundant one, the general trade of the country keeps good; and it is confidently believed that the travelers will find buyers disposed to place good orders for the season. An improvement has been experienced in the colonial demand, while the more settled condition of affairs in the Argentine Republic, as well as the more pacific policy evident in South Africa, where there is a large white population, cannot fail to give stimulus to the carpet trade. The troubled condition of affairs in the land of the Celestials does not commercially affect us, for the Chinese have not been customers for carpets to any appreciable extent up to the present. Just now the looms are employed on small orders from the home market, and in supplying the improved colonial and foreign demand referred to. Nothing like a spurt can be expected for the present. The wool market has shown considerable animation recently. At each of the sales held the quantity of wool offered has been large, and the buyers unusually numerous, visitors being present from France, Germany and America. Those who supplied their wants early in the week were the most fortunate, for as the sales progressed prices hardened, in the better qualities quite a ½d. per lb. advance being easily maintained.

NOTTINGHAM.—The cotton hosiery trade is dull; demand is small and prices are low. On woolen goods, quotations are going higher in spite of relatively few purchases, consequent upon the hardening value of wool, and manufacturers of hose, vests and combinations hope soon to be doing well. Fancy hali-hose are moving in moderate quantities, and there is a limited demand for fancy silk and embroidered hosiery. In Leicester the hosiery industry shows considerable recovery as a whole, and manufacturers are demanding higher rates for all choice fabrics. Cotton stockings and socks were exported from this country last month to the value of £22,226, compared with £18,535 in August last year. Other varieties of cotton hosiery were shipped abroad to the value of £15,663, compared with £11,793, and all varieties of woolen hosiery to the values of £75,621, against £63,906. So far this year exports of woolen goods have totaled £497,324 against £576,201 in the same eight months of 1897, and £581,209 in 1896, while exports of cotton goods have reached £236,898, against £245,282 in 1897 and £315,295 in 1898. In May cotton hosiery ran to only £20,034 for all varieties and woolen hosiery to only £39,115. The improved demand from America since the conclusion of the war is the main explanation. British exports of lace are increasing, and the cotton varieties may now be said to have fully recovered from the slackness of the earlier months of the

year in the Continental demand and to have partially recovered from the depressing effects of the Dingley tariff. The state of trade generally in this centre is fairly good. The plain net section continues to be an exception, and mosquito nets are in strong demand; prices are adverse to buyers, and manufacturers command their own prices, as the supply is not equal to the demand. Fine hobbins and Mechlin tulles are also very steady in value, but orders are being turned out more rapidly. The demand for spotted nets, on the other hand, has been overtaken by the supply. Heavy, stiff nets are not moving so freely, but prices are unchanged. Corset and antique nets are good for special markets. The fancy branches are scarcely so well off. Makers of the best qualities of Valenciennes laces and insertions are brisk, and Dentelle Filoche and imitation torchons are increasing in favor. Honiton braids, linen beadings and pearls are moving in fairly considerable quantities, partly for the manufacture of point laces and partly for millinery trimming purposes. The goods are required in white, ecru, butter and black. Maltese, Brabant and Bretonne laces on the other hand are slow and production has been curtailed. Point de Paris and duchesse laces are selling, but the orders are too small to keep machinery fully employed. There is little movement in embroidery trimmings. Irish trimmings, Swiss embroideries and crochet edgings are especially depressed. American laces, tattings and common warp goods are selling for special markets, but shipments are below the average. Chantilly and other silk laces are neglected, and few new goods are appearing. Silk veilings are not so bad, and novelties are eagerly looked for, but the supply exceeds the demand, and there is severe competition. Manufacturers of lace curtains are doing a good business. Manchester advices speak of a better general enquiry from the United States. Ecrus in curtains are having more attention. Some large offers of beurre, tan, cream and white Plauen combination laces are on the market. There has, however, on the whole been rather less doing in embroidery goods of late, and St. Gall houses have not experienced such a good run. Chenille-spot dress nets are among the goods receiving attention. All classes of lace goods will, according to general expectation, be more briskly sold by the end of September.

KIRKCALDY.—Capital reports are to hand from Kirkcaldy. The linen trade is busy, and, of course, the floorcloth and linoleum factories are working full time. Very large quantities of the last-named class of goods continue to be despatched. Some good tweed orders have been booked recently by South of Scotland manufacturers, some of whom are very well employed, but generally speaking trade is not what it ought to be at this season. The outlook is considered promising, but those makers who have looms standing idle would like if the prospects would materialize into orders. It is expected that the further advance in the price of wool will help matters.

MILAN.—There were very few transactions recently, but despite the limited demand all the markets, here as well as in the Far East, remain totally unaffected, and prices show no signs of weakness. No alarm is exhibited at the decreasing demand, which is thought to be only temporary and which is regarded as natural after the great activity during the last few months. Some efforts have been made to obtain concessions in price, but holders are not inclined to take lower offers, but are, on the contrary, confident that the mills will soon appear in the market in larger numbers to supply their needs. Reports received in Milan show that the activity in the American mills has not increased, which explains the unimportant part taken by them in the recent movement; but at the same time it is shown that stocks in America are very much depleted, and that a good demand will soon emanate from that country. Asiatic silk is as firm in prices as the European product.

ZURICH.—The raw silk market remains calm, with nominally unchanged prices. There is a better demand for silk

goods, but as the mills have so far failed to obtain an advance equivalent to the present high cost of the raw material they hesitate to make new purchases, and the impression is gaining ground that prices may be lower. Reports from Italy insist on the necessity of maintaining the present figures, on account of the high prices paid for cocoons; but, on the other hand, it is claimed that the consumption is not as large as it was last year, and faith is no longer placed in a possible scarcity of silk. The opinion prevails that the highest prices for the season have been reached. The mills are fairly busy, some new orders having been received, but on a whole the season is backward.

BELFAST.—A steady and improving business has been done in the linen market lately, and the improvement gives every indication of continuance. The volume of trade would probably have been larger had prices remained stationary, but as advances have been asked in several quarters, buyers held back for the present. There is little change in the yarn market. A quiet business has been put through, and prices are fully maintained. For some counts of line welfs an advance has been obtained. Brown linens have sold more freely, and some substantial orders have been placed for the various widths and qualities. Thirty-eight inch power-loom linens for bleaching are moving off steadily in larger quantities. Unions are selling freely, and the demand for tow-made goods is improving. Handkerchiefs are in fairly brisk demand, particularly cotton handkerchiefs. Hand-loom linens are selling well at late rates. Cloth for dyeing and hollands is still in dull request, and household linens are also quiet. There has been a shade more activity in the bleached and finished end of the trade, and the improvement affects all branches. Cross-Channel orders are a little heavier, but not so good as might be expected. The demand for white linen is improving. Damasks and house-keeping goods are in better request, and unions are selling somewhat more freely. Export trade is growing. The United States market is taking a gradually increasing quantity of goods, and the demand is expected to continue. Canadian trade continues active. Orders are coming to hand from the Continental markets in fairly satisfactory fashion. West Indian trade has made a moderate improvement.

LYONS.—Lately the Lyons market was very quiet; there were few sales from stock, and orders placed were of little importance. Paris buyers in particular hesitate to purchase owing to the threatening political situation, and commission houses also refrain from buying. The chief obstacle to larger transactions appears to be the price question, buyers being unwilling to pay the advance made necessary through the higher cost of raw materials. As the market, however, is very firm there can be no question that these prices will have to be paid. Aside from the reasons set forth, the uncertainty regarding fashion induces buyers to delay ordering. There seems little doubt that plain and fancy taffetas will continue to lead, but with regard to the styles in fancies no definite opinion seems to exist. Warp prints are much favored in light grounds, and the demand for mousselines is expected to be heavy, but as to other fabrics opinions differ. At present there is a fair demand for bengalines and peau de soie, and indications point to an increased use of plain silks, but fancies will undoubtedly continue to play an important role. The demand from America is very light. The velvet trade is good. Orders for plain velvets are continually arriving, the low-priced grades being more sought of late. Black velvets are in best demand, being bought in cheap as well as in best grades. Mills producing fancy velvets are very busy, but in these also low-priced goods are in heaviest request. The ribbon trade has increased in activity, moires, ombres and pointilles hold the lead in fancy ribbons, and in staple goods all silk taffeta in wide widths were in good demand. Velvet ribbons continue to sell freely in black and colors.

REFELD—The silk trade was quiet lately. The retail trade has not opened up in either the large cities or the provinces, the season being several weeks late. Efforts of wholesale houses to secure fresh orders meet with only moderate success. Among the desirable fabrics taffetas continue to hold the lead, but the supply has become sufficiently large to interfere with profits. Aside from taffetas, bold-ribbed serges and mervelens, for jacket and cloak linings, remain in good demand, but in all other lines trade is quiet, and even moire velours, which had been the feature of the season, appear neglected. The falling off in the demand for silks seems to be due, to some extent, to the great favor bestowed on velvets. The demand for plain and fancy velvets in black and colors remains heavy, and appears to be on the increase. Plushes and velours du Nord are also much sought, and the supply for the time being seems inadequate. The demand for these goods will naturally decrease in a few weeks, but for velvets the demand is expected to increase, and it is likely that next year pile fabrics will enjoy even greater popularity than at present.

FINISHING LOW-GRADE CHEVIOTS.

While the finishing of this class of goods does not have to undergo so many operations as some classes are subjected to, nevertheless the work needs the closest attention in every respect. A great deal of carbonized stock is used in the manufacturing of them, and should this part of the business not be properly attended to it is likely to cause trouble and annoyance to the finisher in various ways, says a writer in *The Boston Journal of Commerce*. For instance, the finisher does not usually handle the stock during the process of carbonizing and neutralizing, and any variation in the strength of the acid and the proper neutralization of it has such a decided effect on the manner in which the finisher should treat his goods to overcome the difference in the handling of the stock before it reaches him. After the pieces come from the loom and are perched, measured, weighed, and the number, length, weight and style marked on the end, they are given to the burkers, who remove all knots, kinks, bunches, etc., then the sewers look them over and mark with chalk all imperfections that need sewing, such as mispicks, threads out and wrong draws. After having carefully performed this part of the work, the goods are now ready for the fulling mills. Should the lists have a tendency to roll they should be tacked before fulling, which is usually done by machines made for the purpose. The goods are now ready for the fulling mills or washers, whichever we will subject them to, according to the condition of the stock and what it is composed of, and the way it has been treated up to this stage. Should it have been properly carbonized and neutralized, and all the acid removed therefrom in the raw state, it would be best to full them in the grease. Provided there is any acid left in the goods when they come to the finisher, they should by all means be scoured before fulling and all traces of the acid removed before the goods are fullled. Of the two methods, that of neutralization of the stock in the raw state is the most preferable and by all odds the cheapest and most beneficial in its results in accomplishing the desired object—that of producing a sightly fabric that feels well in the hand and has a good felt. A much better felt is produced by fulling in the grease than fulling clean. The presence of acid in the goods when they come to the fulling mills is a serious detriment to their progress, and they ought by all means to be washed, extracted and dried if it is possible before fulling. We will take the former method of the two and full them in the grease.

There are two ways of soaping a piece of goods before fulling: That of entering the goods in the mill and then pouring the soap on to them while they are running, and the other is the use of the soaping machine by which the soap is distributed

more evenly and a more even moisture is obtained by running the goods through the soaping twice and changing ends. After sewing the goods in the fulling mills and marking with string on the list one yard apart, as a guide for the amount of shrinkage you have to take of them, put down the trap and weight according to the shrinkage required. The soap should be perfectly cold. Close the mill for a sufficient length of time till the goods have commenced to full. Be careful not to get them too warm as the heat from fulling will soon start the colors on goods of this quality. After fulling to the required width and length they are then ready for scouring. A much thinner soap can be used in scouring than fulling. See that a good lather is obtained. After first starting up run them about fifteen minutes, then commence to thin down the liquor by gradually allowing a flow of water to run in the washer and frequently opening the gates to drain off the suds. When all traces of soap have disappeared turn on the cold water and rinse well. After the goods come from the washer extract as soon as possible and dry them. It is best to cover them with wrappers if they have got to lay any length of time, as they are liable to get air stained. Low quality goods are more subject to this than goods of a good grade of stock. After drying a steaming on the brush will soften and loosen the nap. In shearing square the nap so as it does not look long and spirally. Have them looked over for specks and pressed, examined, measured, rolled and packed in cases for shipment.

NEW ANILINES, DYESTUFFS.

Direct Deep Black R.W. (Patented)—The somewhat greenish shade of direct deep black E recently patented by the *Farbenfabriken* has led the above named firm to produce and place upon the market a new cheap, one dip black of a less greenish tone, called Direct Deep Black R.W. A small card of loose dyed patterns is in rapid preparation, showing some good combinations with benzo olive, etc. Considering the concentration of this color its price compares most favorably with other allied blacks. An advantage also not to be overlooked is its adaptability to be topped with aniline salt, producing a shade which should meet with appreciation.

Benzo Chrome Brown, 5G.—The well-known aniline family of Benzo Chrome Browns has recently been added to by the above homogeneous brand. Benzo Chrome Brown is used in the same manner as the older brands, more especially for the dyeing of cotton, viz., with glauber salt and soda ash, and after chroming with equal parts of chrome and blue-stone. Dyed direct it produces an orange brown very fast to light, which can be used to advantage in mixtures owing to its clearness of shade. If the direct dyed shade is afterwards treated with 3 per cent. bichromate of potash a great alteration in shade takes place (the shade being converted into a yellowish brown), its fastness to washing being at the same time very much increased.

If an addition of blue-stone be made to the chrome bath a still greater change of shade takes place, a yellow tan brown being obtained, which is extremely fast to light, and washing. In combination with the older brands of Benzo Chrome Browns (G, R, B, and 3R) it serves for the production of old gold, straw, tan and Rhaki shades. In the dyeing of half-silk and half-wool this new color is not so adaptable as the former brands.

Benzo Olive.—This is by no means a new product; but owing to recent improved methods in the mode of its manufacture has led to a consequent reduction in price. Benzo Olive gives a dull green shade, very fast to light, and also to washing; it can be used for olives, and on account of its level dyeing properties, for combinations. In combination with direct deep black R.W., very fine blacks can be produced. By topping

with basic colors, such as auramine, turquoise blue, etc., it is possible to produce very bright shades. Greater fastness to washing in these shades is easily obtainable by simply adding 2-4 per cent tannic acid to the Benzo Olive dye-bath (dyeing and preparing with tannic acid in the same bath), and the shade can then be topped with basic colors, either with or without previously fixing in an antimony bath.

Nigrosine, S R., and S.R.T. (Soluble in Spirit)—Two new qualities of Nigrosine (soluble in spirit), distinguished for their easy solubility, and which, when used for lacquering, give a fine smooth brilliant surface. The S. R. brand produces a strong bluish-black shade, whilst the S R. T. yields a deep black shade, so often demanded. In dyeing, these new products give fuller shades than the previous Nigrosine brands.

For fuller particulars call on or write to the Dominion Dyewood & Chemical Co., who are always pleased to send samples, quote latest prices, or forward immediately the newest German pattern cards and circulars. Sole agents in Canada for Farbenfabriken, vormals Friedr. Bayer & Co., Elberfeld, Germany.

COMPOSITION OF WOOL.

In treating on the composition of wool, everyone knows that in the growth of the fiber certain glands situated beneath the skin of the animal exude a greasy substance which, coating the fibers to a considerable thickness, serves to protect them from injury. The amount of this encrusting, or rather preserving substance is very variable, and on the raw fiber is always associated with more or less sand, dirt and other foreign matter. The proportion of pure wool is therefore variable, says a Bradford correspondent of the *Indian Textile Journal*, as is shown by the following analyses, which, however, do not by any means represent extreme cases:

ANALYSES OF RAW WOOL AFTER DRYING.

	No. 1.	No. 2.	No. 3.
Moisture	6.26	10.4	8.2
Sand, dirt, etc.	11.13	3.1	20.1
Pure wool	35.31	59.5	31.2
Yolk (greasy matter)	47.30	27.0	40.5
	100.00	100.0	100.0

In order to estimate accurately the amount of pure fiber in a sample of raw wool, a weighed quantity of the latter should be thoroughly dried, then be thoroughly scoured and cleansed, dried, and afterward weighed. Speaking generally, the finer varieties of wool contain a larger proportion of yolk than the coarser and less valuable sorts.

Confining our attention now to a consideration of the pure fiber, it may first be noted that wool, in common with hair, is chemically the most complex of textile fibers. Cotton, being a carbohydrate, is composed of three elements, carbon, hydrogen and oxygen. In the silk substance an additional element, nitrogen, is found. Wool contains still another constituent, sulphur, and the simplest formula which will at all conform to the percentage composition contains thirty-nine atoms of carbon. It has been considered that the wool fiber consists of a definite chemical compound—keratine—but this view is probably incorrect, the fiber appearing to consist of at least two, and possibly several, closely-allied, very complex substances. It is possible, and even probable, as was suggested when dealing with the structure of the fiber, that the outer epidermal scales have a different composition to the rest of the fiber, but whether this is the case or not, we now know with some degree of certainty that wool is not a simple, definite chemical compound. This at once accounts for the discrepancy observed in the figures obtained by different chemists on submitting wool

to ultimate analysis, the following figures giving an indication of the extent of this variation:

PERCENTAGE COMPOSITION OF PURE WOOL FIBER.

	Marcke	Mulder.	Bowman
	and Schultze.	Per cent.	Per cent.
Carbon.....	49.54	50.5	50.8
Hydrogen ..	7.29	6.8	7.2
Oxygen.....	24.13	20.5	21.2
Nitrogen.....	15.60	16.8	18.5
Sulphur.....	3.44	5.4	2.3
	100.00	100.0	100.0

In addition to the above constituents which every grower and handler of wool should know, there is always present in the wool fiber a small quantity of mineral matter, amounting frequently to between 1 and 2 per cent., and consisting principally of salts of potassium, calcium, iron and aluminum, with traces of silica, phosphorus, etc. The character of this mineral matter is, no doubt, largely determined by the nature of the soil upon which the sheep has been pastured. The natural color of wool varies from white to dark brown or almost black, and with regard to the cause of this and the substance that gives the fibers this color, little is known. Iron or manganese is always present in the ash or fiber of dark wool and magnesia is frequently found in light-colored samples, but in all cases an oily organic matter of a similar color to that of the wool may also be extracted, and it is uncertain to what the color of the wool is actually due. In this respect at least nature baffles science.

WET FINISHING.

We will take for our first illustration a well-filled piece of cassimere, which has been in the mill not less than two hours, and is therefore well felted up. These goods require a close finish and each thread is to show up plain and clean, and the goods are to have no spring to them; that is, they want to be finished so that it is hard to tell which way the nap runs. It is out of the question to produce such a finish literally, and therefore there is always more or less chance of the buyer kicking on the finish of these goods. Our endeavor, therefore, should be to gig the goods in such a manner that all possibilities for kicking are reduced to its lowest limits. It does not matter how many pieces are put on the gigs at the same time, whether it be one or two or four, the treatment they are to receive is always based on the requirements of one piece. The first thing we do is to examine our cylinder and count the whole number of slats it contains, which, in the case under consideration, we will assume to be eighteen slats. Of course the cylinders are not all alike in this respect and many of them contain twenty-four slats. These slats we divide into sets of equal numbers, writes a contributor of the *Boston Journal of Commerce*, the purpose of which will be apparent as we go along. They may be divided into two, three, four or more sets according as the nature of the goods under treatment require. For each of these sets we select a number of slats of increasing sharpness, of which a supply should always be kept on hand, and the selection of the different grades should not be left to chance, but must be carefully watched by a competent person, so that when slats of certain grades are required, we do not take those which are three or four degrees sharper. By having the slats thus graded it is possible to increase the efficiency of the teasing surface gradually and systematically. These grades of sharpness are made necessary by the fact that all gigging must be commenced with the dullest work we have and the sharpness of the teasels is gradually increased as the

goods are able to stand them. If a piece of cloth of the kind which we are using for illustration should, for instance, be treated with a set of slats which have not been used before, and are therefore stiff and sharp, we are certain to not only destroy the teasels, but injure the cloth also, for on account of the points being stiff and sharp, they will get caught in the felt and practically tear out the fibers instead of combing them out as it is intended the gigning should do. This will not only affect the strength of the goods, but will also greatly affect the finish, and while this is being done the points of the teasels are suffering also and they will be mutilated in such a manner that they will be of very little use thereafter.

Right here is a point which strongly suggests to us to reduce the several sets to low numbers rather than to have fewer sets containing a larger number. For instance, if we should divide our cylinder into six sets of three slats each, it will be readily seen that three slats cannot do as much damage, if the wrong kind is taken, as six would if we should divide the slats into three sets of six slats each. Now, this is a little point which it will be well at all times to take into consideration, for it will surely lessen the chance for damage. No matter how careful we may be, it must be confessed that none of us are infallible, and this being so, the chances for mistakes are always with us. Many finishers lose sight of this little point or ignore it altogether, especially when finishing close-finished goods, and when a finisher is driven for production at all hazards, without much regard to quality, as many of them surely are, they may be excusable in hastening the gigning process, so long as goods do not become tender, but it cannot be denied that good or excellent results cannot be attained in this way, and the goods when finished will always lack that agreeable feeling which can only be produced by slow and careful gigning. So it will be readily seen, even by the beginner, why the slats should be divided into sets and why each set should contain slats of increasing sharpness. In this division and grading of the slats consists the system so necessary in the gigning process, and each system must be based upon the individual judgment of the one in-charge. There is no use in laying down a system for any one, for these things cannot be done by hard and fast rules, but must in all cases be the result of thought and judgment, and not only must the goods be taken into consideration, but the quality of the teasels also. A gigger, if he is to be any good at all at his profession, must above all be possessed of good sound judgment. His education otherwise may be below the average, but if he has plenty of that commodity called common sense it matters not if he can read or write, if he has that there will be little trouble about his work. In fact we know of more than one gigger who is not able to either read or write his name, but when it comes to gigning he is right there every time, and a glance will tell him if the right kind of slats are being used or not. After having thus established the need of a system let us look at the subject a trifle closer and see how it should be applied. Upon close examination we find that the system to be adopted for the goods under consideration would fall far short of giving satisfaction on almost any other kind of goods, and the more we study this question the more we are impressed with the necessity of having a system for each class of goods which is to fit that class and no other, and in no other way can gigning ever be made an undivided success.

NEW DYESTUFFS.

Benzo Dark Green B (Patented)—Is a new green dyestuff belonging to the Benzidine family, and which will undoubtedly be a welcome addition to this group of colors. Benzo dark green B is a homogeneous product, equally well adapted for

cotton dyeing or printing. Owing to its exceptionally good covering power it should receive attention not only as a self color, but in combination with other Benzidine colors, for the production of dark greens, olives, etc. It is also suited for dyeing half silk, where it is desired to dye both fibers uniformly.

Benzo Fast Black (Patented).—This is not a new color, but considerable improvement has recently been made in the method of its manufacture. Benzo fast black is one of those colors, which dyed direct, as well as diazotized, is unusually fast to light. Diazotized and developed with developer "H," it produces an intense black, fast to alkalis, acids, hot-ironing and rubbing. Fastness to light may be still further increased by the after treatment with copper sulphate, which is carried out in the running bath, and therefore does not necessitate extra labor.

Alizarine Fast Grey (Paste), Patented.—Alizarine Blue Black B and Alizarine Cyanine Black G are the only two black dyestuffs which are true derivatives of alizarine. The former is very much in demand on account of its extreme level dyeing properties and exceptional fastness, especially for the dyeing of fast slates and drabs. The Farbenfabriken Company of Elberfeld having discovered a new true alizarine, have placed it upon the market under the name of Alizarine Fast Grey in paste. The new grey color, which closely resembles Alizarine Blue Black in its properties, and may be considered as an addition to the same class, since it produces deeper and blacker shades than the latter. On account of its extreme level dyeing properties, it is more particularly suited for dyeing light shades fast to milling and light. It produces shades very fast to light, milling and stoving and as is the case with alizarine generally it is further unaffected by acids and alkalis, and therefore not changed by carbonizing.

Direct Deep Black R W (Patented).—A violet black of great tinctorial power in its properties; it closely resembles the older brands—Direct Deep Black G and E, from which it differs mainly in its shade and strength. It dissolves very easily. Direct Deep Black R W is adapted for dyeing loose cotton or hank, as well as piece goods. On linen and jute good black shades are also obtainable. To obtain a jet black, it can be combined with Direct Deep Black E or Benzo Olive. Direct Deep Black can also be recommended, topped with aniline salt, a dye process in use with Benzo Chrome Black Blue, when it produces shades very fast to soaping and light, which are very full and cheap blacks.

Benzo Nitrol Colors.—The Benzo Nitrol colors, which have been placed upon the market up to the present time, when compared to the ordinary Benzidine products, have the advantage over the latter that, after developing with Benzo Nitrol developer, they produce extremely full shades, which were hitherto quite unobtainable, with ordinary substantive dyestuffs. For dyeing velveteen, these products are of importance, and therefore the Farbenfabriken have produced a pattern card No. 686, 1898, Benzidine colors on velveteen, which should be of interest to dyers of velveteen.

Alizarine Sapphirole B (Patented)—The Farbenfabriken of Elberfeld, recognizing the fact that a level dyeing Blue Alizarine color, bright in shade and fast to light, was much needed by wool dyers, used every effort to produce a color answering these requirements. Alizarine Sapphirole B has just been discovered by the above firm, and in its fastness to light, Alizarine Sapphirole is claimed by the makers unequalled by any acid blue wool dyeing color in existence. The only other color which at all approaches it in this respect is Brilliant Alizarine Cyanine 3 G, which is much faster in shade. It is further, fast to stoving and stands washing well. In one respect it is markedly distinguished from almost all other blue wool colors. Owing to its unusual fastness to rubbing, even in dark navy blues, it is practically free from rubbing off. On a chrome mordant it produces a

much greener shade than when dyed with acid, and is equally as fast to milling as Brilliant Alizarine Cyanine J G. For combination colors, Fast Yellow extra, Azo Fuchsine and Orange 2 B, and other colors known for their fastness to light, are recommended.

Diazo Violet R (Patented).—Is a new Diazotizable Benzidine dyestuff, which, although of little value as a direct color, when hazotized and developed with developer "A" or Beta Naphthol, produces a violet, fast to washing. The shade of this color when diazotized and developed, closely resembles the direct shade of Congo Corinth B, and is very suitable for combinations, giving with Primuline and bordeaux and clarets and reddish blue with Diazo Navy Blue J B. When developed, the color is fairly fast to light, and in this respect closely resembles the above named products, but is slightly inferior in its fastness to washing, although it meets the usual requirements. The fastness to light is considerably increased by passing the goods after development, through a bath of copper sulphate.

For further particulars regarding the properties and methods of application, of any of the new products and samples, pattern cards, etc., write to the Dominion Dyewood & Chemical Co., Toronto, sole agents in Canada for the Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany.

ENGLISH AND AMERICAN WAGES.

A summary of prices paid English and American cotton weavers for the same class of goods, and the different methods practised in the two countries to determine the prices, does not reflect much credit on the American method. It has been the English practice for years for representatives of the manufacturers' and weavers' unions to meet and fix a price for weaving. The standard upon which this price list for plain cloth is based is a loom 45 inches wide in the reed space, weaving cloth 39, 40 or 41 inches wide, 60 reed Stockport count or 60 ends to the inch, 15 picks to the quarter inch, as ascertained by arithmetical calculation, with 1½ per cent added for contraction; length, 100 yards of 36 inches to the yard; twist, 28s, or any finer number; weft, 31s to 100s price, 30c, or 2d. per pick; then follow clauses governing all additions and deductions of price, for variation from the standard.

Percentages are added for every inch increase in the width of the cloth, for every extra two ends to the inch, for every pick or fraction of a pick below 11 to the quarter inch; for every pick over 16, when using certain wefts for coarser twist in fine reeds, for weaving narrow cloth in broad looms, states a writer in a recent number of the American Wool and Cotton Reporter. Deductions are made for each inch the cloth decreases in width, down to 24 inches, below which no deductions are made; for every two ends less per inch down to 50 ends. Sateens and drills are paid 8 per cent additional up to 25 picks, and ½ per cent for each pick over 25; when the warp threads exceed the picks per ¼ inch, ¼ per cent shall be added.

This list at the present time is subject to 10 per cent reduction, and the prices given in comparison are net. No. 1, American standard print 64x64, 28 inches wide, 46 to 52 yards long, prices 7½ to 16 cents per cut. Weavers run 8 to 10 of the ordinary plain looms, and from 16 to 24 of the self-feeders, earning from \$6 to \$9 a week. The English weaver receives for 100 yards, 49.8240 cents, when the various deductions are made, and runs four looms, and earns about \$5 a week. No. 2, sateen, 42 inches wide, 130 ends, five in a dent, 66 picks, 53 yards to a cut, 55 cents a cut, or \$1.10 per 106 yards. Weavers run six looms, and average \$7 a week. English price for the same, 96 cents plus 1½ per cent, for width, plus 8 per cent, for sateens, plus 26 per cent for reed, plus 9 per cent for ends over picks, plus 6 per cent for length, equal \$1.23 net. No. 3, sheeting, loom, 45 inches, cloth 36 inches, 60x60, 53 yards long, 22½

filling, 20s. warp, 10 cents a cut, or 20 cents for 106 yards. Weavers run 16 and 20 looms, and average \$7 a week. In England, when narrow cloth is woven in a broad loom, the difference between the reed space of the loom and the width of the cloth is divided by two, and the answer added to the width of the cloth.

This cloth would be called of the standard width, and the price for 106 yards would be 56 cents. No. 4, sateen, loom 45 inches, cloth 40 inches, 96 reed, four ends in a dent, 45 picks per ¼ inch, 76 filling, 70 warp, price \$1.90 for 120 yards. English price, 2d. per pick, \$1.80, with the percentages for length, sateen and reed added is \$3.03, or \$1.13 more than is paid in America. American weavers run six and eight looms and earn from \$6 to \$7.50 a week. No. 5, sateen, loom, 45 inches, cloth, 38 inches wide, 84 reed, four ends in a dent, 42½ picks to the ¼ inch, 120 yards, price, \$1.80. English price, 2d. per pick, \$1.70 with the percentages for reed, sateen and length added \$2.71, or 91 cents more than the American manufacturer pays. No. 6, sateen, loom 45 inches, cloth, 39 inches, 84 reed, four ends in a dent, 37½ picks to the ¼ inch; 122 yards long, price, \$1.50; English price, 2d. per pick, \$1.40, plus the percentages for reed, sateen and length, equals \$2.36, or 96 cents more in England than Massachusetts. All the American prices quoted above are for Massachusetts mills, and are the highest and lowest on the class of goods mentioned. In the weaving of fancy and colored goods great care, skill and patience are required, and this is recognized in England. Every additional harness adds to the care of the weaver, and when cross drafts are used it requires not only skill, but an intelligent understanding of the draft, to draw the threads in correctly, and preserve the regularity of the pattern. It is the same when a number of different colors are used, or a combination of plain, twill and cross drafts, woven in checks or stripes. Uniform dobby list, first, basis, plain cloth; second, add the following per cent. for cloth woven with 4, 5 and 6 staves or harnesses, 12 per cent; 7, 8 and 9 staves, 16 per cent; 10 and 11 staves, 18 per cent; 12 staves, 19 per cent; 13 staves, 20 per cent; 14 staves, 22 per cent., and 1 per cent additional for each additional staff; third, single lift dobbies, 10 per cent. extra; fourth, stripes and other cloth with more than two ends in a dent to be paid for by the number of ends per inch; fifth, skeleton selvage harnesses not to be paid for by number of ends per inch; fifth, skeleton selvage harnesses not to be paid for; sixth, when the card is not required to be turned to find the pattern, 3 per cent. less to be paid; seventh, when the loom is turned to find the pick, 10 per cent more to be paid. Leno or cross weaving entails more stoppage than any other class of weaving, and drawing in the threads, and tying the doups, demand the exercise of skill, care and patience. One shaft of doups is paid 70 per cent., and two shafts of doups, 80 per cent. additional.

In New England weavers run 2 and 4 looms of leno, running at about 140 picks per minute, and in some mills they run two lenos and three other fancies. In all such cases the time lost in stoppage varies from 30 to 45 per cent. Sample No. 7 stripe leno spots on plain stripes, 34-inch loom, cloth, 29 inches wide, 64 reed, 68 picks, 55 yards of warp, 12 harnesses, two shafts of doups, two shuttles, 68 cents per cut. The weavers run four and five looms, with two and three lenos in, the others being checks, and earn \$6.50 and \$8 per week. The English price is 2d. per pick, or 68 cents plus for lenos and harnesses, 99 per cent., or \$1.21 for 70 yards of warp. English weavers run two looms for 56½ hours a week at a speed of about 170 picks per minute, with a loss of about 15 per cent. for stoppage. They weave about 200 yards per loom a week, and earn about \$6.96 a week.

Colored goods standard of price for plain and stripes is based upon cloth, 28, 29 and 30 inches wide; 52 to 64 reed, inclusive; 74 yards of warp, weft, 16s. or any finer counts, price

1½ pence per pick. The price of checks is based upon the standard of 70 yards of warp, 2d. per pick. A larger latitude is allowed in the reed for colored than in white work, because it is often necessary to have two or more counts of yarn in the same warp. Add 2 per cent. to reeds, from 64 to 70; above 70 an additional 1 per cent. for each extra two ends per inch. Deduct two per cent. from 52 to 46, and 3 per cent. below 46. For each inch the cloth decreases in width below 28, deduct ¼ per cent. down to 20 inches, below which no deduction shall be made. Add 1 per cent. for each inch increase in width from 30 inches to 36 inches; 1½ per cent. from 36 to 40 inches, and 2½ per cent. per inch above 40. Twist coarser than 16s in a reed finer than 68, 2 per cent. for each count. Weft coarser than 16s., add 2 per cent. for each count down to 12s.; for 11s., add 11 per cent.; 10s., add 14 per cent.; 9s., add 18 per cent.; 8s., add 22 per cent. Dobbies up to and including 18 lifts or threads, add 18 per cent., with an additional 1½ per cent. for each additional lift or tread. When the number of lifts used equal the number of threads in a dent, the reed to be paid for shall be found as follows: Three ends in a dent, add 25 per cent.; four ends in a dent, add 50 per cent.; five ends in a dent, add 75 per cent.; six ends in a dent, add 100 per cent. to the count of the reed used. When the lifts used are not equal to the number of threads in a dent, add the following percentages to the reed actually used: three ends in a dent, 37½ per cent.; four ends, 75 per cent.; five ends, 112½ per cent.; six ends in a dent, 150 per cent. All the above additions and deductions shall be made separate.

The prices paid for gingham in New England varies from 18, 24 to 28 cents per cut of from 46 to 56 yards in length. The weavers run four and six looms, and earn from \$5 to \$7.50 a week. English price is 2d. per pick for 70 yards of warp, or about 65 yards of cloth, as the shrinkage of the warp from milling is about 7 per cent. This would be \$46.80 for 65 yards of cloth, or 72 cents per yard compared with 38, 48 and 56 cents a yard paid in New England. No. 8, colored fancy spots, cloth 30 inches wide, 80 reed, 95 picks, 56 yards to a cut, 16 harnesses, three shuttles, 68 cents a cut. Weavers run five looms, and earn about \$8 a week. English weavers get \$1.21 for 65 yards of cloth, run four looms, and earn about \$8.50 per week. No. 8 is from a mill that pays the highest prices for weaving. The weavers run three looms, and average \$9 a week.

This is a combination weave and two warp beams are used, with six colors in both warp and filling. The top beam is silk, and contains 1,625 ends, the bottom beams contain 2,474 cotton threads. The weave is seven silk stripes, with five ends in a dent, 54 corded stripes of two dents, with three threads in a dent, and the remainder two threads in a dent. Twelve harnesses are used, and six colors in the weft, giving a combination check, raised twill stripe, cord stripe and plain weave. The cloth is 30 inches wide, 100 reed, 80 picks, 55 yards of warp. \$1.55 a cut, or 29-11 cents per yard for weaving. The English price is 80 cents plus percentage for reeds and harnesses, equal to \$2.35 for 70 yards of warp, or 35-14 cents per yard. On plain work the American weaver runs more looms, works more hours, gets a little more money at the end of the week, but weaves more yards of cloth for less per yard than the English weaver.

On other classes of goods he runs more looms and weaves less cloth per loom for about the same amount of weekly wages that the English weaver receives.

On the higher class of fancies, the English weaver is decidedly better off than the American weaver, for he runs less looms, receives more per yard, and a little more in his weekly wages. The wages are adjusted amicably in England, the manufacturer recognizing that the man who sells his labor has as much right to have a say as to the amount he shall sell it for

as the man who buys it has a right to say how much he will pay for it. The prices are fixed by men on both sides well versed, both theoretically and practically in the business. In America, the price list is fixed on the basis of what a weaver can be forced to work for, and any effort on his part to assist in deciding what his labor is worth is met by the manufacturer saying he will not have any man or body of men run his business. It is a fact that can be proved. American cotton manufacturers have said that what they figured on was about \$1 a day for a six loom weaver. This system of paying less than a jobber's work will never build up an industry, for the inducements for capable men are greater in other industries. When the cotton manufacturers get the wages firmly fixed on the dollar a day basis, they will find they are paying all that class of help is worth, if not a little more. Will some one tell why the American cotton manufacturer cannot undersell England in the markets of the world, when the cost of labor is lower here than there, or why England has 42 per cent. and America only 21 per cent. of the world's spindles?

FABRIC ITEMS.

Erb & Co.'s glove factory, Berlin, Ont., was closed down for a short time recently, owing to the large power cable breaking.

A true bill has been returned at the Sessions in the charge against the T. Eaton Co., of applying false trade descriptions to goods.

The new Toronto city hall will have carpet at \$4.50 per yard in its council chamber. The contract has been given to a Toronto firm.

Samuel Carsley, the well-known dry goods merchant of Montreal, was married in Quebec, Sept. 19th, to Miss Emily King, of London, Eng.

Owing to ill health, Ronald McD. Stephen, jobber in woolens, 1727 Notre Dame St., Montreal, has been ordered by his doctor to give up business, and is preparing to sell off.

The Customs Department has discovered that a London, England, firm is sending clothing to Canada by parcel post, to which is attached a statement of value lower than the invoice price.

Marcel & Co., dealers in men's furnishings, at Ottawa, are reported assigned, with liabilities of \$2,200, and assets of \$1,600. T. Marcel has been using the name of his father-in-law, E. Farmer, in his business, owing to former troubles.

Information is laid in the Exchequer Court against Michael FitzGibbon and Frederick Schapheitlin, doing business in Montreal as dry goods merchants, for the custom house. There is a claim for \$2,584 for custom dues, \$59,284 for goods forfeited, and \$59,284 for additional goods forfeited, with penalties of \$23,200, or in all \$144,352. There is also an information in the same case, of customs dues without penalties, of \$43,921.

By the explosion of an acetylene generator, E. H. Morse, a prominent dry goods merchant of Blenheim, Ont., received serious injuries. The generator had been leaking for some time, and the injured man went to the cellar to make an examination. Lighting a match, he was examining the joints for a leakage, when the gas exploded with great force. Mr. Morse received terrible burns about the head and face, and fears are entertained that the injuries will result in blindness.

News has been received of the death, in London, of J. P. Clark, once one of the most prominent figures among the merchants of Montreal. Mr. Clark was at one time the head of the dry goods firm of Clark, Thompson & Co., in which his partner was T. P. Thompson, and later of that of Clark, Winks & Co., in which his partners were George Winks and William MacDougall. The place of business of this firm formed the east side of Custom House square, now Place Royale.

E. J. Henderson, liquidator in the estate of Reid, Taylor & Bayne, wholesale milliners, Toronto, has forwarded to the trade creditors of the firm cheques in full of their claims. There is a large surplus remaining, which will be paid into court, pending the result of litigation now in progress. The book debts of the firm, which amounted to \$9,600, have been disposed of to the new firm of Charles Reid & Co., for \$7,000.

Two wholesale dry goods firms in Halifax, N.S., are about going out of business. The employees of Murdoch's Nephews and of Kenny & Co., have received notice that their services will not be required after the end of the year. Murdoch's Nephews is a part of a business with headquarters in London, and with a branch in New York, and has a capital behind it surpassed in amount only by that of two dry goods firms in Canada. William Miller, of London, died a few months ago, and the heirs have decided to withdraw from the field in Halifax. The firm has always been one of the most influential in the city. Kenny & Co. succeeded T. & E. Kenny, a dry goods firm that was established sixty or seventy years ago, and which in days gone by made a great deal of money for its owners.

TEXTILE IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the textile imports into Canada from Great Britain for August and the eight months to August, 1897-1898

	Month of August		Eight months ending August	
	1897	1898	1897	1898
Wool	£ 502	£ 3,120	£ 17,307	£ 27,394
Cotton piece-goods	35,013	47,089	266,394	340,655
Jute piece-goods	11,031	8,316	76,648	88,127
Linen piece-goods	13,063	16,822	83,052	103,685
Silk, lace	613	354	3,790	5,361
" articles partly of	2,815	4,120	13,573	21,889
Woolen fabrics	41,458	54,222	176,810	219,253
Worsted fabrics	73,000	59,209	418,979	431,220
Carpets	14,774	21,361	105,030	131,875
Apparel and slops	41,005	36,290	200,886	225,486
Haberdashery	16,464	14,481	102,685	108,639
Writing-paper, etc.	2,321	3,419	21,018	17,057
Other paper	648	743	5,043	5,570

A GREAT CANADIAN INDUSTRY.

It is a curious story and worth telling, it only to show that Canadian competition begins to mean something in the markets of the world. The Montmorency Cotton Mills Company works entirely in grey cottons, and the mill was established at the foot of the falls because of the magnificent water power they furnished. The mill made an opening for itself in the Chinese market and cultivated it steadily. The management, on the lookout for new openings, saw that American grey cottons were crowding out English cottons in Africa and elsewhere. The idea occurred to them that if British cottons must go in any case and be succeeded by cheaper fabrics, it would be better that Canadians, rather than Americans, should take the trade. The Department of Trade and Commerce, which closely watches market conditions, on being applied to, thought so, too, also made enquiries in England and gave the firm's agents letters to Gray, Dawes & Co., a noted English house engaged in the African trade, writes the Quebec correspondent of The Toronto Globe. They were shipping American cottons at that time to Zanzibar and Mombassa, for the trade of the British East African and Great Lakes region, but moved somewhat by the Jubilee enthusiasm which swept over the empire last year, and more perhaps by the fact that Canadian cottons were fully as good value as American, they decided to use Canadian goods. The immediate result of finding a market in East Africa as well as China is that the mills at Montmorency, which at present

employ about three hundred and fifty workpeople, are now in process of enlargement to double the former capacity, and will employ after this fall between 700 and 800 persons. The management praises warmly the work of Sir Richard Cartwright's department, which has thus opened up a trade of tremendous possibilities in Africa. Gray, Dawes & Co. are at present building a railway under Government guarantee from Mombassa on the coast to the Great Lakes. It will be pushed north through Uganda to connect with the railway that Kitchener is building up the Nile towards Khartoum. The result will be the opening up of a vast tract of the most thickly populated territory in Africa, and a great enlargement of the market. The manager of the Montmorency company says their route of shipment at present is to London, thence by P. & O. steamers to Aden, thence by Gray-Dawes' steamers to Mombassa. The distribution in the interior is by Gray-Dawes' own agents. In China the retail trade is controlled by the Chinese themselves, who cable for quotations through Shanghai agents. Between the Chinese and African trade there is plenty of room for expansion, and from the enlarged mill the shipments to British East Africa alone will run at an average of probably over \$1,000 per day. The industry can take care of itself, and there is no fear of American competition. Our total export of home manufactured cotton has more than doubled in the last five years. It was only valued at \$24,061 in 1893, and in 1897 it had increased to \$349,861. With right methods of operation Quebec can beat out New England in cotton manufacturing.

THE VALLEYFIELD MILLS.

Recently through the kindness of the manager of the Montreal Cotton Mills Company, Louis Simpson, the correspondent of The Montreal Herald was enabled to see the great improvements that are being made to the already vast establishment located in this town, and which is destined to make Valleyfield the cotton manufacturing centre par excellence of the whole Dominion. Valleyfield has doubled its population within a very few years, the figure now being placed at 11,000 souls, and no doubt this will be very considerably increased when the next census is taken three years hence. Here are the good reasons for such a supposition. The imposing new mill for the spinning and weaving of fine cloths hitherto unknown in the Dominion's manufacturing record, is located on what is known as Dufferin road, on the south side of the canal, and just opposite the new powerhouse completed about two years ago. The main building, which is ready for the roof, is 150 feet square, five stories high, and each story measuring about 16 feet in height. There is, likewise, an "L," which is a very important structure of five stories 180 feet long, and 80 feet wide. These massive piles, which would do infinite credit to Montreal's manufacturing districts, are most solidly built of the best lime stone, the latter having been luckily discovered on a farm belonging to the manager. This, however, is not all, as the company are also building a large warehouse 220 by 80 feet four stories high and capable of storing no less than 10,000 bales of raw cotton, and when this is fully completed it will greatly add to the immensity of the Valleyfield mills. The roof of the new mill will be put on this month, but Mr Simpson explained that the management was in no great hurry as far as the machinery was concerned. He said that the walls must be dry, and the building in perfect condition before the high class machinery intended for the mill can be installed. In fact, Mr Simpson added, that in England a mill is never built and started within twelve months, thus allowing the walls to dry and settle into position. However, there will be little or no settling at Valleyfield, as the mill is built on the solid rock. The machinery will be got in about December, and the great mill started in February. "How many hands will you employ in the new mill?" Mr Simpson was asked. "About a thousand. We have in the old mill about 1,520 operatives and

500 at construction, so when the new mill is started we will probably have 2,500 at work." Anyone can see at a glance what this additional labor and output means to Valleyfield and the surrounding parishes of Beauharnois county. It is understood that the company's pay roll now reaches \$30,000 per fortnight, and in some cases households in this vicinity having a good many of its members at the mills, receive as much as \$50 and even \$60 each pay day. About two-thirds of the operatives are French-Canadians, and the remainder English-speaking. Mr. Simpson states that when they can get hold of girls and boys before they are too old, they can be trained to do quite as good work as those who have been in the Lancashire mills from generation to generation. However, there is still more to tell about this hive of industry. The Northrop Loom Company, which has only recently been incorporated, with A. F. Gault as president, and Louis Simpson, vice-president, are building a fine structure of brick and stone 260 feet long and 60 feet high, and will be at work early in December. There is also a foundry 120 feet in length, and of the same width, and this concern will employ another contingent of 100 men. This establishment will be the first of its kind put in operation in Canada, and Mr. Simpson says they have already orders on hand to keep them running a year and a half. Of the quota of men employed two-thirds will be skilled labor, and some of these may have to be secured from abroad. Mr. Simpson has just returned from the annual meeting of New England cotton manufacturers and managers, held in the White Mountains, New Hampshire, and he states that they will meet next fall in the city of Montreal.

THE LONDON WOOL SALES.

The fifth series of colonial wool sales, which closed on Oct 8th, showed a marked improvement in prices, and merinos are 10 to 15 per cent. higher than at the close of the fourth series. The series opened on Sept. 20th with a full attendance of buyers, including a number of American representatives. The catalogues offered were of a miscellaneous assortment, and consisted of 12,380 bales. A medium selection of cross breeds predominated in all sections. New clip greasy, suitable for American representatives, was competed for keenly and realized 10¹/₂d. A few parcels of New South Wales scoured sold at 1s. 9d., while fine clean cross-breeds ruled slightly dearer. Lower sorts of inferior clips ruled irregular and in buyers' favor; better clips sold briskly at unchanged rates. A small supply of Cape of Good Hope and Natal showed a fractional advance. The home buyers operated freely and the continental buyers were only fair purchasers, owing to the small selection offered suitable to their wants.

PREPARATION FOR GIGGING.

The goods must be scoured to remove all fulling soaps, extracted and dried. The self-balancing forms of hydro-extractors are provided with a basket that will adjust itself to an uneven load without jarring. At the same time, the extractors of any make require more or less attention. When there is a suspicion that the shaft is out of shape, place the fingers first on one cap, then on the other, and note if there is any trembling to be felt. If there is, see that it is not caused by the belt pull, or by the shaft being loose in the bearings. After making these things right, if there is still a vibration, it is probable that the shaft is either bent out of round or the basket is out of balance. The best way to prevent an extractor from getting bad is to take good care of it. Never let the bearings run dry or loose, and never let the machine run, even for a minute, with unbalanced parts. Never let the belt be too tight. Above all, do not let a man run the machine who does not know how to take care of it, says a writer in an exchange. That causes more sprung shafts and bad-running baskets than everything else together.

The next step in the preparation of the goods is the drying. Estimating and installation of successful heating apparatuses, be they either low pressure hot water or low pressure steam, require considerable care and thought. There are certain rules for finding out the size of mains to carry so much radiating surface, and what size feed should be used to so much heating surface, but these rules are not infallible. For there are so many conditions to be taken into consideration, such as the length of the main, the number of branches to be taken from it, the number of turns in it; if it is to be very flat, or can have a good rise, also as to the size of branches to radiators, coils or dry rooms; their size depends not only on the amount of heating surface in them, but also as to their distance from the boiler, what floor they are on, and what system of drying is used.

Whatever the description of drying system used, the cloth as it passes to the dryers contains about 28 per cent of water, and about 5 per cent. to 9 per cent. of this water can be left in the cloth after it is apparently dry, as the fabric would absorb that amount from the atmosphere were it made absolutely dry.

The evaporation takes place into the atmosphere, and each pound of water evaporated at 212 degrees carries off 212.9 thermal units of sensible heat above the zero Fahrenheit, and 957 thermal units in the form of latent heat, so that the total heat above zero carried off is 1,178.6 thermal units per pound of water evaporated. The water of condensation in the dryers should be collected and returned to the boiler at the temperature due to the pressure. If in the manufacture and drying of fine woolsens it is required to purify the water supply, and the impurities are of a character that they cannot be removed by mechanical filtration after precipitation by chemicals, it is possible to use the steam finally supplied for the dryers, first at a high pressure to evaporate water in a steam heated boiler, perhaps repeating the operation, and finally to use the resulting steam to heat the dryers.

The process of raising the nap on the goods must be, of course, governed according to the class of stock in the fabric and to the general conditions. Wool and cotton are frequently combined in certain classes of mixed fabrics. The tendency of the cotton in such cases is to impart a harsh rough appearance to the material which can be diminished to a limited extent by effective napping. Then we have a class of fabrics in which the yarns are spun from unsorted fleeces. Long and short fibers, as well as fine and coarse, and strong and tender ones are worked in bulk. The results, therefore, must be varied, and until final completion of the fabric it is impossible to judge of its special features. It might finish soft, firm and lustrous, or its general appearance might be exactly the reverse. The finisher must also contend with improperly scoured wool, for if any traces of foreign substance, such as grease or other oil matter have been allowed to remain on the wool, and it goes through in this condition, the operation of gigging will be more difficult. The greasy substance forms a coating about the fiber. Another obstacle is in the coloring of various mixtures of shoddies wastes, flocks and correspondingly low class stocks. Such material being obtained from old stock, it is obvious that quantities of refuse matter will be present. Much of this, together with considerable loose fiber, will be gigged off, if care is not taken. Of course, it is desirable to remove as much foreign matter as possible, but it will not do to reduce the weight of the cloth too much by taking off an excess of loose fiber. Owing to these varying conditions, the gigging operation can best be considered in connection with the separate kinds of goods.

(To be continued).

Burglars a short time ago entered the woolen mill of D. Allport, Smith's Falls, but got nothing for their trouble. They put a heavy charge of powder in the safe, although it had been left open, all the money having been taken out.

THE WOOL MARKET.

MONTREAL.—Prices of all Merino wools are 5 to 10 per cent. higher. Manufacturers all over Canada are very busy, but a good deal of cheap stock is still being used. Canadian wools are low this season, owing to its being impossible to send them to the United States as usual. The fifth series London wool sales closed on Oct. 8th, 10 to 15 per cent. higher for all merino wools over July series. We quote greasy capes 14½ to 16½c.

TORONTO.—Nothing appears to be doing on the Toronto market, which is very quiet and there is practically no change since last month. There is very little business and no movement whatever in fleece wool.

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.

Ala. Willis is building a new woolen mill at Golden Grove, St. John.

The Yarmouth, N. S., woolen mill property was sold Oct. 3rd to S. A. Crowell, for \$8,200.

The removing of old and the putting in of new machinery is still going on at the Canadian Colored Cotton Co.'s mill at Merritton, Ont.

By a vote of 54 in favor, and only 2 against, a meeting of ratpayers of Parrshoro, N. S., decided, on October 5th, for a bonus of \$10,000 to a pulp mill in that place.

The woolen factory and dwelling house of W. & C. Brown, Kewansville, Ont., suffered considerably in the storm which accompanied the cyclone at St. Catharines last month.

G. Wilson and Wilham Cook will manage the Kingston mill of the Dominion Cotton Mills Co., instead of Superintendent Kimball, who has been transferred to Brantford.

Three thousand cords of spruce logs are used each year by the Sissiboo Pulp Mill, near Weymouth, N. S., which turns out say twenty five tons of pulp per day. It is a water-power mill.

Three degrees which have become established in dyeing are in French, German and English: 1. Grand teint; vollig echt; absolutely fast. 2. Bon teint; mittel echt; medium fast. 3. Petit teint; leidlich echt; loose color.

Timothy McAuliffe, mechanical superintendent of the Almonte Knitting Co.'s mill for the past ten years, has severed his connection with that company. Thos. Nesbitt is filling his place.

The Lincoln Paper Mills, of Merritton, Ont., which suffered severely by damage to their mills and property in the tornado which raged over St. Catharines and district, are exerting every effort to repair the damage as quickly as possible.

A building permit has been issued to the Gale Manufacturing Company for a new four story factory on Mincing-lane, to cost \$8,000, to replace their white wear factory burned some time ago in Toronto.

Willie Cleary, son of Jas. Cleary, had the tips of some of his fingers taken off recently in the Hawthorne Woolen Mills, Carleton Place, Ont.

The Dominion Cotton Mills Co. is building a large machine shop, about 90x60 feet, in Montreal. The shop, which is situated opposite the Hudon Mill, will be used for repairs of machinery to the cotton mills owned by the company.

A pulp mill expert from Manchester, Eng., has arrived in St. John, N. B., to look into the proposed Cushing sulphite pulp mill, in the interests of Mr. Partington, of Manchester, who is expected to subscribe two-thirds of the stock of a fifty ton mill.

J. V. Methot's carding mills at St. Antoine de Tilly were burned down Sept. 18th through the fall and explosion of a coal oil lamp. There was an insurance of \$1,300 on the property.

D. Cook, for many years the manager of the Dominion Cotton Co.'s mill at Brantford, Ont., has withdrawn from the service of the company and his place has been filled by the appointment of Mr. Kimball.

Wm. Thoburn, Almonte, Ont., is offering to sale some of his machinery, as it has been replaced by some new plant in the flannel mill. He has put in two Davis & Turber mules, one 300 spindles and one 320 spindles, which are expected to increase the spinning capacity 15 per cent., also a Patrick press, which will put a better finish on the flannels and turn out a great deal more work.

A gentleman in the wool business who has lately made a tour of Ontario woolen mills, reports finding them all busy. Indeed, some of them are obliged to decline orders. This is more particularly the case with those manufacturers who produce cheap flannels. At the same time they are not free buyers of wool, and are indisposed to agree in the necessity for an advance in price of foreign wools which the recent London wool sales clearly indicate.

A company is being formed to manufacture pulp and carry on other industries at Grand Falls, 220 miles above St. John city. The river St. John has at that place a sheer fall of some 70 feet, and the total fall, including the rapids below, is over 100 feet. It is proposed to make a canal from the basin of the river above the falls, following what is supposed to be an old channel of the stream and reach the river again a short distance below the rapids. There will be an enormous water power, and the company, in which U. S. Senator Proctor is one of the principal stock-holders, expect to carry on a large pulp making business. Other directors are James Manchester, formerly of the firm of Manchester, Robertson & Allison, St. John, N.B., and George F. Baird.

FOR SALE

THE

Machinery of the Blyth Woolen Mill, Peterborough, Ont.

has been placed in the hands of the

CEO. REID CO., 118 Duke St., Toronto

for immediate sale.

Catalogues will be forwarded on application.

Wool Washers

Dryers and Carbonizers

KITSON - - -
MACHINE CO.
LOWELL, MASS.

Walter Rose, Toronto, Ont., has taken a situation as boss carder in a woolen mill in Chicago, U. S.

J. T. Huber Co., proprietors of the Doon, Ont., shoddy mills, have just put in a dynamo and electric light plant in the mills.

George Lefaire has been appointed liquidator of the insolvent estate of the Quebec, Que., Clothing Manufacturing Company.

Geo. H. Stowell, formerly a resident of Gananoque, Ont., but latterly running a carding mill at Iroquois, died at that place Oct. 3rd.

The Hull city council has instructed its solicitor to begin suit against the Toronto Rubber Company for \$30,000 for breach of contract to locate in that city.

Kerr & Harcourt, spool and bobbin manufacturers, are now fully installed in their new factory at Owen Sound, Ont., having completed the removal of their business from Walkerton.

Dobson & Co., Canmington, Ont., are making extensive changes in their woolen mills. They are putting in a heavy engine and boiler, the present one being altogether too small for the mill and electric light plant.

T. A. Code is having a complete waterworks system for fire protection put in his knitting mill. Stand pipes will be placed at convenient places and the male help will be instructed and drilled in the use of the hose and hydrants.

Root, Benn & Co., Bradford, England, wool merchants and combers, have dissolved partnership, A. Benn retiring altogether from the business, and the business of the firm being carried on by Goodman Root, under the name of G. Root & Co.

The woolen mills of this town are soon to be lighted by electricity. They will operate a dynamo exclusively for illuminating the mills, salesroom and office. The company had acetylene gas under consideration for some time, but decided in favor of the safer and more easily handled and reliable electric illumination.—Oxford, N.S., Journal.

The Paris Transcript understands that the Penman Mfg. Co. are about to make extensive additions to their mills there. They are going to convert the rear part of the old Maxwell works into a three-story building, capable of employing 150 hands. The works at St. Catharines, it is said will be moved to Paris.

St. John, N. B., is making a contract with George Cushing, one of the largest lumber operators of the district, to supply him with water at a very low price on condition of his erecting a large pulp mill in connection with his lumber business. For this enterprise ex-Mayor Robertson, of St. John, has procured the offer of £65,000 by a paper maker in England. The balance of the stock is offered in St. John, some part of it to be taken by Cushing's firm and the remainder by the public.

A very hearty tribute is paid to Mr. Whitehead, the manager of the Dominion Cotton Mills, by The Kingston News. In mentioning with approval the passing by the council through the first two readings of the by-law to exempt the Kingston Cotton Mill from taxation, it adds: "To Mr. Whitehead personally Kingston owes a debt of gratitude which cannot now be fully estimated. But for his influence with the directors of the company, there would not have been a ghost of a chance of a continuance of the present mill in this city, with or without a bonus."

The Ontario Government has concluded an agreement with an English syndicate by which E. A. Bremner, London, Eng., has secured from the Government the right to cut spruce timber on a reserve along the Sturgeon river. The tract consists of 75 square miles of spruce lands. The company engages to spend a million dollars in buildings and plant, and will have an operating capital of two and a half millions. The pulp mill was formally opened at Sturgeon Falls, Oct. 1st, and the foundation of the first of six paper mills has been laid. The company undertakes to employ not less than 240 hands. The output will be 120 tons per day. The terms of the contract with the Government provide that all spruce cut must be manufactured in Ontario. Wm. G. Finlay, Lawrence, Mass., who has had eighteen years' experience, has been engaged as working manager.

SITUATION WANTED as carder by a man of sixteen years' experience as overseer; could also take charge of tick spinning. Temperate habits, well recommended. Address, DONALD MACK, P.O. Box 333, Peru, Ind.

POSITION WANTED—Young man of good education, at present employed as superintendent in a large woolen mill in the south of Scotland, would like similar position in Canada. Can assist in designing. Address "SUPERINTENDENT," care of Canadian Journal of Fabrics, Montreal, Que.

WILL shortly open Manufacturers' Agency in Montreal. Have you any specialty you want me to handle? Thirteen years' experience in a general store in Canada; fourteen in the general dry goods trade in the U. S. Speak English and French. Am a pusher. EXPERIENCE, ENERGY, care Canadian Journal of Fabrics.

BOSS CARDER or second hand in card room woolen mill, has had ten years experience on all classes of goods and cards and feeds. Will go anywhere or a permanent position. Address W. R., care Canadian Journal of Fabrics.

SITUATION WANTED

Wanted situation as manager or superintendent of woolen mill by a man who has had a large and most successful experience on shoddy goods. Married, 39 yrs. of age. Address J. E. C. L., care Canadian Journal of Fabrics.

SITUATION WANTED

Experienced long chain dyer and yarn printer desires situation. Fast colors. Economical. Nine years with leading gingham, shirting, and fancy cotton, woolen and silk dress goods mill in New England. Age 39. Married. Address "M," care of Canadian Journal of Fabrics.

Wanted

By experienced Cotton Bleacher and Finisher, situation in Canadian mill, Best of references covering a long period of years. Age forty. Married. Apply "WEST POINT," Care Canadian Journal of Fabrics.

The Royal Electric Co.

**MONTREAL
TORONTO**

CANADIAN MANUFACTURERS OF THE

S. K. C. TWO-PHASE APPARATUS

Alternating Current Generators

Alternating Current Motors

Alternating Current Arc Lamps

Served from the same circuit

S. K. C. TRANSFORMERS

Correspondence solicited for all kinds of Electric Installations.

A public meeting was recently held in Parrsboro, N. S., to promote the establishment of a pulp mill at that place, Dr. Townshend, Dr. Hayes, and E. Wheaton are in charge of the matter.

The Lancaster, Ont., Machine Works have secured the agency for Eastern Ontario for the Hamilton Acetylene Gas Machine Co., and have already made a number of successful installations.

J. H. Bishop, of Wyandotte, will establish a branch of his fur factory at Sandwich, Ont. He has leased the old brush factory building, and will fit it up for the manufacture of fur garments.

The Warwick Clothing Manufacturing Company of Warwick, Que., is lighting its works throughout by electricity. The order for the necessary apparatus has been given to the Royal Electric Company.

The Maritime Sulphite Fiber Co., Chatham, N. B., has ordered a 500 h.p. cross compound condensing engine from the Robb Engineering Co. to replace the present 250 h.p. simple engine and to provide for contemplated enlargements of the plant.

The Woodstock, N. B., Woolen Mills Co. is now busy on fall and winter orders the new superintendent Wm Knox who comes from Vasselboro, Me. is said to be giving excellent satisfaction. The number of employees at present is seventeen.

John Holmes, a commissioner of the New Zealand Government, is visiting America to induce competition for a prize of £2,000 offered by his government for the best process—mechanical or chemical—of treating the native fiber, New Zealand.

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OF GALT, Limited.

MANUFACTURERS OF

Full Fashioned Lamb's Wool Underclothing, Hosiery and Knitting Yarns, Perfect Fitting Ladies' Ribbed Vests, Sweaters, Jerseys, Knickers.

and hemp, known as pharminum tenax. After a visit to Washington Mr. Holmes will return home by way of Vancouver.

The T. Eaton Company, Toronto, has resolved upon the erection of a manufacturing building on the north side of Albert street. It will have a frontage of 101 feet, a depth of 110 feet, and is to be a 5-story brick building. It is proposed there to make up clothing, and the factory will be connected with the present premises by means of a tunnel, 7 feet by 7½ feet, under the roadway.

John McDermott died recently in Almonte, Ont. He was for many years in the employ of the Rosamond Woolen Co., where he served in various capacities, latterly having charge of the electric light plant in the mills. Five or six years ago he entered the service of the Almonte Electric Light Co., with whom he remained until March last, when failing health compelled him to give up work.

A portion of A. L. Grindrod & Co.'s woolen mill, Sherbrooke, Que., collapsed and fell into the Magog river with its contents. The destroyed portion of the mill was used as a picking and store room and was situated between the two main parts of the structure. Some time ago it was noticed that the building was weakening and on the day it fell it was noticed that the underpinning was giving way. Preparations were being made to examine the timbers when the building collapsed. The main shafting ran through the building and the shafting was pulled through the weaving room. A large portion of the wool in the building floated on the water and was saved. The destroyed building was a two-story structure and was a total loss.

CHEMICALS AND DYESTUFFS.

Market is firm without much change. Orders are coming in freely and enquiries are good Sulphate of copper is higher. The following are current quotations in Montreal. —

Bleaching powder	\$ 1 95	to \$ 2 00
Bicarb. soda	2 00	" 2 05
Sal soda	0 70	" 0 75
Carbolic acid, 1 lb. bottles	0 35	" 0 37
Caustic soda, 60°	1 75	" 1 80
Caustic soda, 70°	2 00	" 2 10
Chlorate of potash	0 13	" 0 15
Alum	1 35	" 1 50
Copperas	0 70	" 0 75
Sulphur flour	2 00	" 2 50
Sulphur roll	3 00	" 3 50
Sulphate of copper	4 50	" 5 00
White sugar of lead	0 07	" 0 08
Bich. potash	0 09	" 0 10
Sumac, Sicily, per ton	55 00	" 60 00
Soda ash, 48° to 58°	1 15	" 1 25
Chip logwood	1 90	" 2 00
Castor oil	0 09	" 0 09½
Cocoon oil	0 06½	" 0 07

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Direct Cotton Colors—Auramine, Congo Red.
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Chlorate of Potash Bleaching Powder
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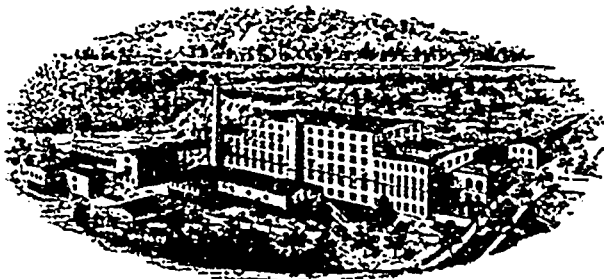
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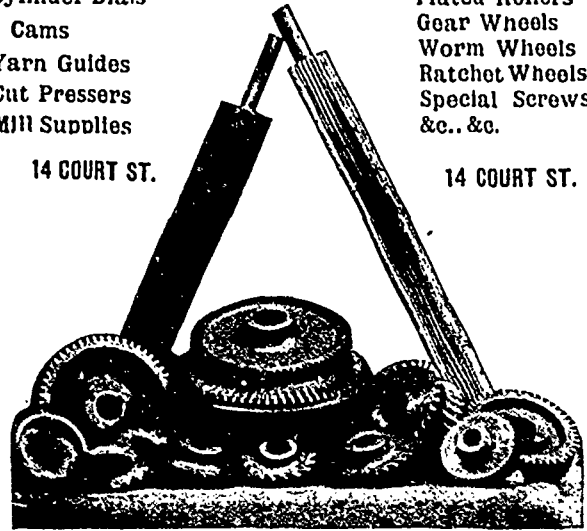
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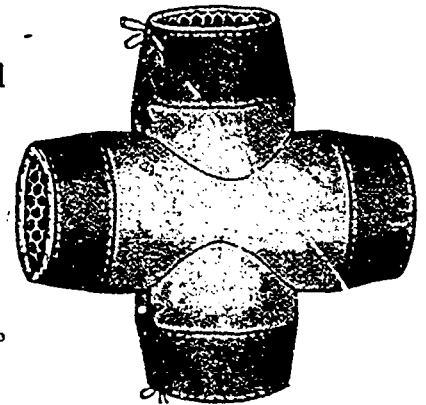
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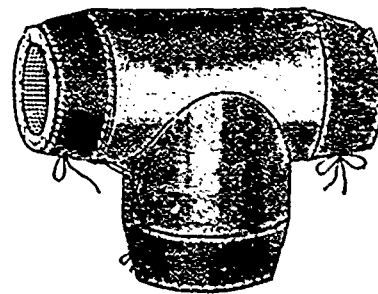
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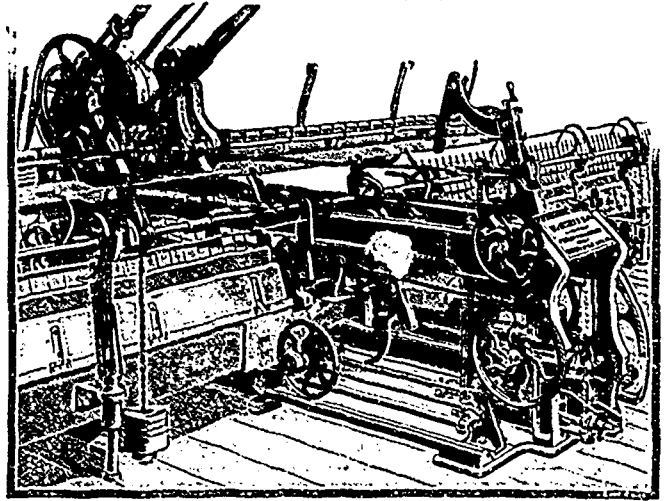
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TEXTILE
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It costs you nothing, and will be to your advantage.
If you do not report, do not complain if your name and business are incorrectly given, or, possibly, omitted.

The following is the information required in the various branches of trade.—

Woolen Mills, Cotton Mills, Carpet and other Factories where Weaving is done: Name and address of Proprietors, and names of the Officers, if a joint stock company; the capacity in sets of cards, looms and spindles (in the case of knitting mills, the number of knitting machines, and whether hand or power machines); when established, whether water, steam or electric power; description of goods manufactured; whether the mill has a dye house; and names of selling agents, if any. When situated in cities the street address is desired

Carding or Fulling Mills: Name; address; capacity; date established, and whether steam water or electric power

Cordage and Twine, Jute and Flax Mills: Name; address; date established; capacity; steam, water or electric power; kind of goods made and material used (whether cotton, hemp, flax, etc.); selling agents, if any.

Sail, Tent and Awning Factories; Upholstery, Wall Paper and Window Shade Factories; Rubber, Oil Clothing, Felt, and Miscellaneous Factories in Textile Factories: Name; address; date established; steam, water or electric power; description of goods made; and selling agents, if any.

Clothing, Glove and Mitt, Collar and Cuff, Suspender and other Factories in Men's Furnishings; Button Factories; Corset and Ladies' Wear Factories: The same as in preceding list, adding, whether selling through agents, or to the trade direct, or whether manufacturing for custom work only, or for the wholesale or retail trade

Hat Factories: Name; address; date established; steam, water or electric power; whether manufacturing Wood Felt, Fur Felt, Silk, Cloth or Straw Hats; and whether selling to the wholesale or retail trade.

Fur Manufacturers. Name, address, kind of goods manufactured, and whether selling to the wholesale or retail trade.

Bleachers, Dyers and Feather Dressers Name; address; whether Job Dyers, etc. of garments only, or feathers, etc.

Laundries: Name, address, and state whether a machinery or hand laundry.

Paper and Pulp Mills: Name; address; Officers, if a stock company; capacity, in tons per 24 hours; date established; steam, water or electric power; number and capacity of engines and cylinders; kind of paper manufactured; selling agents, if any.

Manufacturers' Agents or Commission Merchants: Name and address, and in what branch of the Textile trade, whether Woollens, Cottons, Hats, Furs, Carpets, etc.

Wholesale Dealers. Name, address and line of business, specifying whether dealing in any or all of the following branches: Dry Goods, Clothing, Men's Furnishings, Tailors' Trimmings, Carpets, Upholstery Goods, Hats, Furs, Millinery and Ladies' Wear. In case you manufacture fabrics also, state in what lines.

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Argument in the case of Young et al., es qual, vs. the Consumers' Cordage Company (Limited), is proceeding before the Judicial Committee of the Privy Council. This was a claim for \$44,144.00, made by the receivers of the delunct National Cordage Company, of New York, for goods sold to the Consumers' Cordage Company, of Montreal. The latter contend that the amount was compensated by an allowance of \$50,000 previously made by the National in consideration of their having abstained from purchasing war material in the open market during 1891 and 1892, so as to leave the National Company as much as possible in control of the market. They also, by incidental demand, made a claim for the difference between the National Company's claim and the allowance of \$50,000. The case was tried in the Superior Court before Mr. Justice Davidson, who gave judgment in favor of the plaintiffs, and dismissed the incidental demand of the Consumers' Company. This judgment was unanimously reversed by the Court of Appeals; and the receivers are now seeking to have the judgment of Mr. Justice Davidson restored. The counsel representing the receivers are the Hon. Edward Blake, Q. C., M.P., and Albert J. Brown, of Hall, Cross, Brown & Sharp, while the Consumers' Cordage Company is represented by R. D. McGibbon, Q. C., Hon Th Chase-Casgrain, Q. C., M.P., and Donald Macmaster, Q. C., with whom are associated Messrs. W. E. Hume-Williams and W. B. Brodrick, of the English bar.

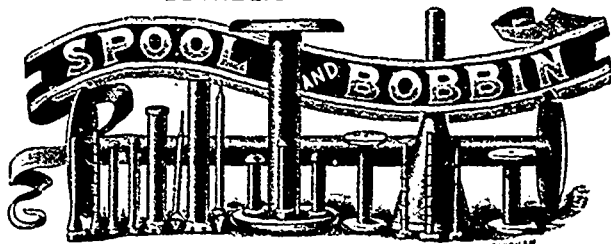
The stock of B. F. Henderson, dealer in men's furnishings, at Parrsboro, N.S., has been sold to H. A. Tucker. The former gentleman purposes going to Halifax to enter partnership with Frank Cook.

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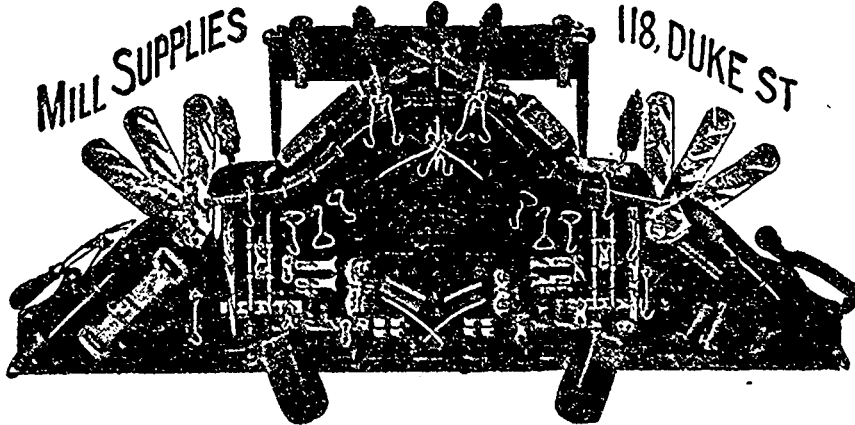
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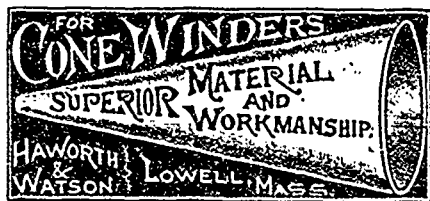
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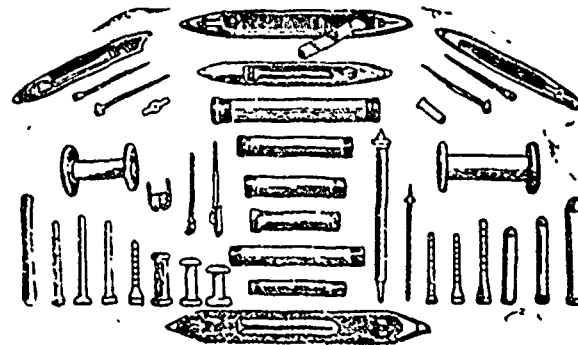
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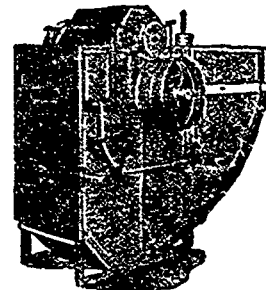
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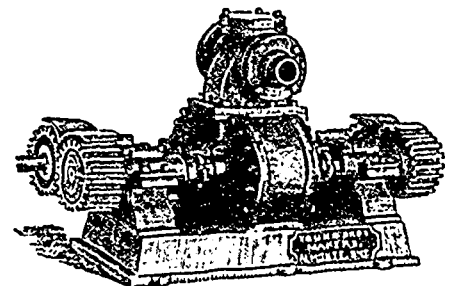
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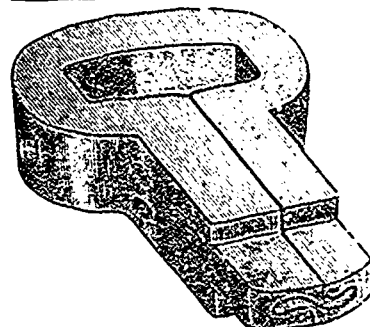


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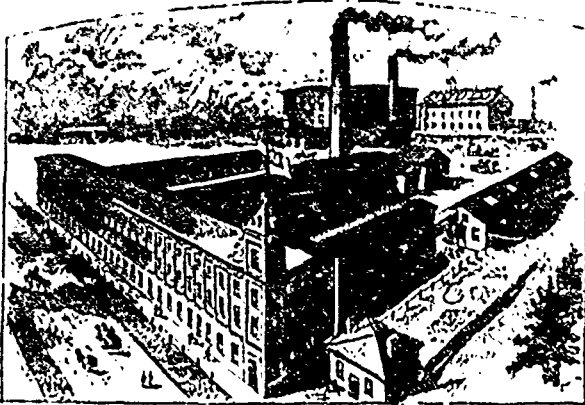
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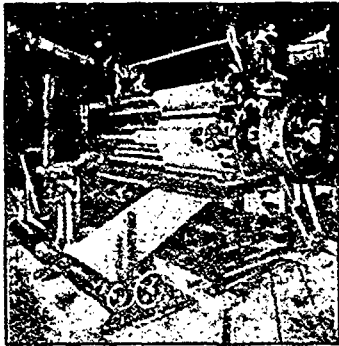
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Some of the machines are running at Canada Mills, Cornwall; Montreal Cotton Co.'s Mills, Valleyfield; Wm. Parks & Sons, St. Johns; Dominion Cotton Mills, Halifax.



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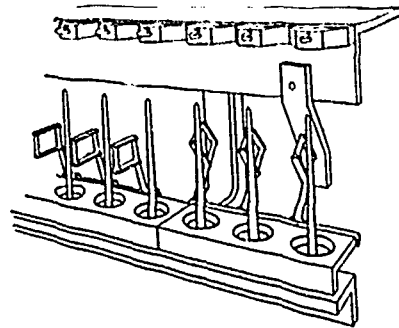
Are you a Manufacturer of Hats or Furs?

Are you a Manufacturers' Agent or Commission Merchant in any of the above lines?

Are you a Wholesale or Retail dealer in Dry Goods, Clothing, Men's Furnishings, Hats and Furs, Millinery and Ladies' Wear, or Upholstery Goods?

Do you want to refer to details of the Tariff on Textiles, or to statistics of all branches of these trades and their relations with other countries?

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SOME QUESTIONS

THE first edition of the **Canadian Textile Directory** was published in 1885, and made a work of 318 pages. It has since grown till it has made a volume of 486 pages, and the coming edition will probably be larger still. Some new features will now be added, and every pains will be taken to make it comprehensive and correct.

Taking it all round, there is no work published containing the amount and variety of information on the textile and allied trades that will be found in the **Canadian Textile Directory**; and the number of copies ordered from abroad for purposes of reference is continually increasing, the last edition having been exhausted some time since by such calls.

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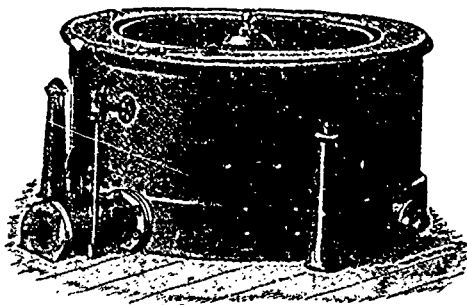
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After numerous practical experiments it has been found by Ferdinand Linneborn, of Hagen, Germany, that a fabric may be produced for garments which shall have properties adapted to keeping the skin cool and thus obviating excessive perspiration. Wool and cotton-wool have the property of absorbing moisture, but wool deprived of oil has it in a considerably greater degree; but in order to prevent clogging of the pores by the fluff, the new fabric is woven or knit with that surface which comes in direct contact with the skin with linen and wool fiber. The linen threads, which come in contact with the skin and are possessed of little power of absorption, are well dried at 100° Celsius, then steeped in a solution of 10 parts of paraffine and 100 parts of benzine, remaining thus from four to five hours at a medium temperature, and when taken out are completely

dried at 100° Celsius, after dripping, the yarn so obtained does not absorb any perspiration. The wool remains in a bath of 40° Celsius, and consisting of 100 liters of water, 6 of spirits of sal ammoniac, 1 1/4 pounds of soap and 2 pounds of soda for four hours. It is then well stretched, rinsed in clear running water and dried at 100° Celsius, while still warm, the wool is now placed in a bath of 40° Celsius and composed of five parts of spirits of sal ammoniac and three of benzine, each skein being now stretched under strong pressure for three minutes, again rinsed in running water and dried. These threads are woven or knit into a fabric having one side entirely of linen threads or yarn, and the other entirely of woolen.

Geo. Rumpel, Berlin, is in receipt of a single order for felt shoes from a Toronto firm totalling \$13,000. January delivery Galt, Ont., Reporter.

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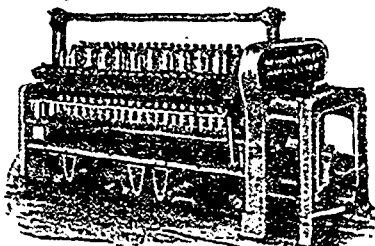
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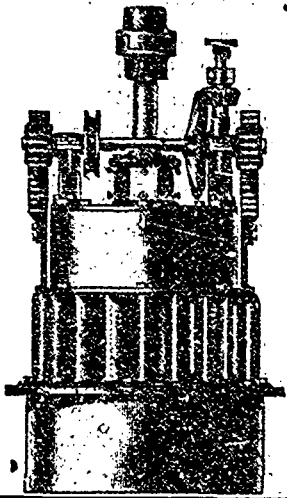
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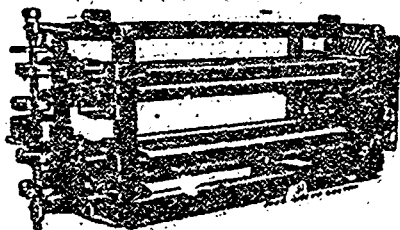
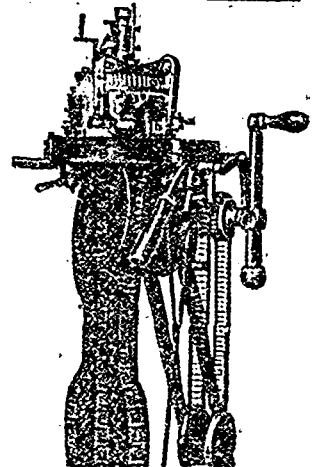
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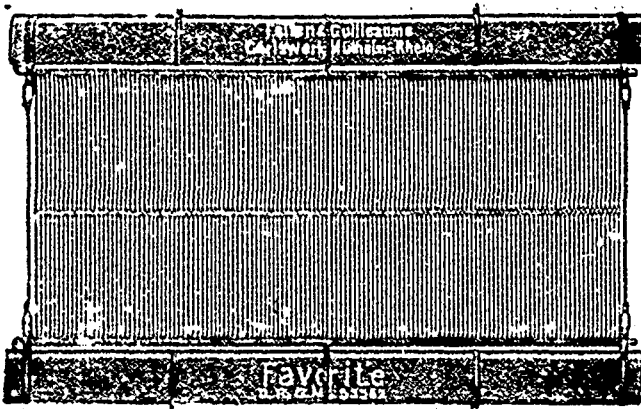
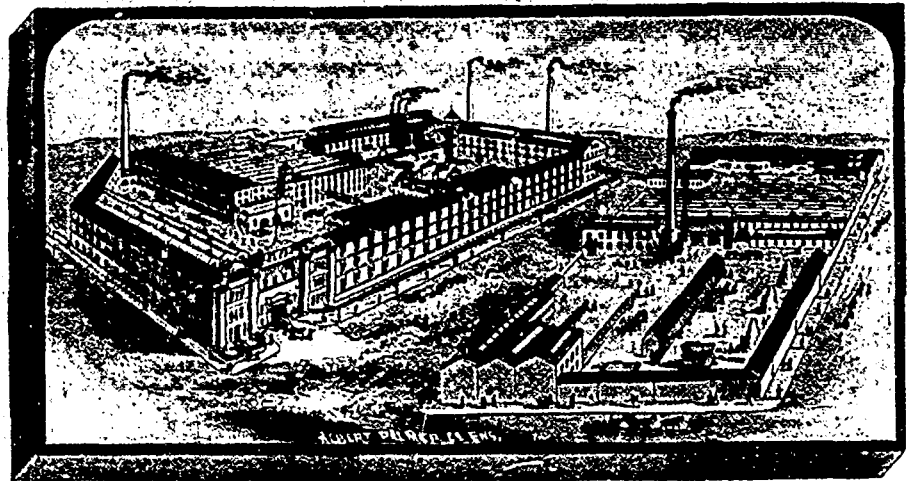
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