

University of Mississippi eGrove

Publications of Accounting Associations, Societies,
and Institutes

Accounting Archive

1923

Cotton mill costs

W. A. Musgrave

Follow this and additional works at: https://egrove.olemiss.edu/acct_inst

Recommended Citation

Musgrave, W. A., "Cotton mill costs" (1923). *Publications of Accounting Associations, Societies, and Institutes*. 128.
https://egrove.olemiss.edu/acct_inst/128

This Article is brought to you for free and open access by the Accounting Archive at eGrove. It has been accepted for inclusion in Publications of Accounting Associations, Societies, and Institutes by an authorized administrator of eGrove. For more information, please contact egrove@olemiss.edu.

**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**

**Affiliated with The Canadian Society
of Cost Accountants**



Official Publications

Vol. IV August 1, 1923 No. 22

Cotton Mill Costs

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**

**Affiliated with The Canadian Society
of Cost Accountants**



Official Publications

Vol. IV August 1, 1923 No. 22

Cotton Mill Costs

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

NATIONAL ASSOCIATION OF COST ACCOUNTANTS

Affiliated with The Canadian Society of Cost Accountants

Official Publications

Vol. IV, No. 22

August 1, 1923

Cotton Mill Costs

W. A. MUSGRAVE,
W. A. Musgrave and Co.,
Hartford, Conn.

BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK CITY

The National Association of Cost Accountants does not stand sponsor for views expressed by the writers of articles issued as Publications. The object of the Official Publications of the Association is to place before the members ideas which it is hoped may prove interesting and suggestive. The articles will cover a wide range of subjects and present many different viewpoints. It is not intended that they shall reflect the particular ideas of any individual or group. Constructive comments on any of the Publications will be welcome.



Additional copies of this Publication may be obtained from the office of the Secretary. The price to members is twenty-five cents per copy and to non-members seventy-five cents per copy.



COPYRIGHTED BY
NATIONAL ASSOCIATION OF
COST ACCOUNTANTS
AUGUST 1, 1923

National Association of Cost Accountants

COTTON MILL COSTS

The real problems of cost accounting in the textile industry arise in those mills making a variety of fancy fabrics. This article deals with the costing of the product of a fine fancy cotton mill only.

The cotton manufacturing industry of the United States ranks with the largest and most important of American industries. Its production is divided into three classes, namely: coarse, medium and fine cotton goods. Inasmuch as mills are equipped to manufacture fabrics that can be made from yarns within a certain range of numbers, it is seldom that orders are taken for fabrics that do not come within the range of yarns for which the mill is adapted. The number of processes through which the raw cotton is passed varies from ten to fifteen, depending on the quality of the product to be manufactured.

MACHINERY AND MANUFACTURING PROCESSES

The machinery used in mills making fine cottons is as follows:

Automatic Feeder	Second Drawing
Opener	Third Drawing
Breaker Picker	Fourth Drawing
Finisher Picker	Slubber
Card	First Intermediate
Sliver Lap Machine	Second Intermediate
Ribbon Lap Machine	Fine Roving
Comber	Frame
First Drawing	Ring Spinning
Mule Spinning Frames	

This machinery is known as "preparatory machinery," which separates the matted mass of fiber into loose flakes and removes impurities, usually accomplished in the opening and picking processes. The further cleansing, evening and drawing out of the fibers to cause them to be in parallel is attained by such means as are adopted in the carding, combing, drawing and fly frame processes.

The strengthening of the yarn is obtained by twisting, as exemplified in the ring spinning and mule spinning departments. There are two kinds of yarn, namely, filling yarn and warp yarn. The former goes crosswise and the latter lengthwise of the cloth. The separation is usually made at the fine roving frames.

The filling is ready for the looms as soon as spun, while warp yarn must be sized (run through a bath of starch, etc.) and dried quickly on a steam-filled drum called the slasher, before it can be woven into cloth.

In the manufacture of cotton yarn the fiber passes through the numerous processes mentioned above, and after the stock is cleaned of all dirt, lint and leaf which may have clung to the cotton after ginning each process has a part in bringing the fibers into parallel and twisting them together to form the finished yarn.

Hundreds of these yarns are grouped together and wound upon a beam to form the warp of the cloth, and other yarns are placed upon bobbins for the filling. The patterns in the cloth are obtained by the raising and lowering of harnesses on the loom, each carrying a number of the warp yarns, while the shuttle passes through carrying the filling.

LACK OF MODERN COSTING

Very few, even of the larger mills, have a modern cost control system. One reason is that a large number of mill treasurers and managers have gained the impression that cost accounting requires a lot of red tape. Another reason is that the installation and maintenance requires a substantial sum of money and that the results obtained do not warrant the outlay. Consequently, many mills still cling tenaciously to the old-fashioned methods of accounting, under which there is an inventory at the beginning of the period and to which is added purchases and manufacturing costs. It is then necessary to take another inventory at the close of the period in order to determine the cost of sales and reveal the profits earned.

POINT PRODUCTION METHOD

The principles used in the determination of costs in the textile industry are precisely the same as those in other industries. Under the point production method the product is measured at a given process and direct labor and burden costs of all prior processes in a department are applied against the production at that point, in arriving at a cost per unit of production.

The theory is that each unit of production passing through the production point must have previously passed through all the other processes. Sometimes conditions arise that call for a deviation from this rule, in which event a solution must be found that will be in keeping with the method outlined above.

ORGANIZATION OF COTTON MILL

The president as a rule does not take any active part in the management of the business affairs. His duties consist chiefly of acting as chairman at stockholders' and directors' meetings. The important functions of buying the raw cotton and selling the product fall upon the treasurer. Those responsible for the out-

put of the mill are known as agent and superintendent and are responsible to the treasurer. The chart shown below fairly represents the organization of a cotton mill.

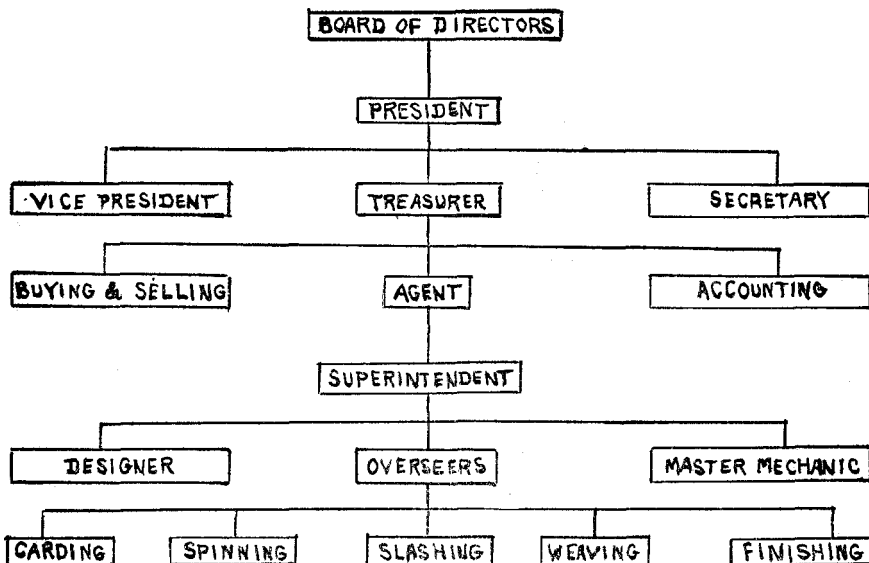
STANDARD COSTS

Standard costs are used to advantage in a cotton mill.

Direct materials and direct labor are consumed in ratio to the production, while certain burden items remain unchanged during the fluctuation of production. If current overhead charges are applied against the current direct cost, the total costs of the product must fluctuate with the production—rising abnormally with decreased production and lowering when production is increased.

When normal burden rates are used, only the burden directly applicable to the product manufactured is included in the cost. In case the plant is being operated at less than normal capacity, the overhead unapplied is not cost, but a charge to idle plant. Otherwise profits or losses on fabric manufactured and sold and losses due to lack of orders and inefficiency cannot be determined. Normal burden rates to be used in costing the product are estab-

ORGANIZATION CHART



lished by estimating in advance the plant expenses. Preliminary to the analysis of expenses, it is necessary to establish productive or non-productive departments in order that a correct estimate may be made of the expenses that apply to each department.

After the expenses by departments have been budgeted, the next step is to estimate the normal direct labor (which is equivalent to labor hours) of each department. The normal burden rate is then determined by dividing the estimated expenses of the several departments by the estimated normal direct labor.

DIRECT MATERIAL CONTROL

The term "direct material" applies to raw cotton and silk, as these are the basic ingredients which form the finished product. Cotton is shipped to the mill in bales and items of expense, such as transportation, insurance in transit and storage are usually considered as additions to the material cost. Silk is generally purchased upon spools from which it must be transferred to quills or cops for the loom.

Practically every mill keeps a record of its raw materials; the difficulty, however, lies in following it through the various processes into the finished goods. In a mill where there are many kinds, grades and staples of cotton passing through the numerous operations, classification is highly important from a cost control standpoint.

In estimating costs so as to establish selling prices, a great deal depends upon the inclusion of raw material prices. A mill may either buy its requirements in a favorable market for future delivery or may obtain options upon stock to cover the season's output. Raw cotton—even of the same grade and staple—is purchased at varying prices and a standard price is set by arriving at the average cost by kinds of cotton, considering the orders taken and the deliveries to be made for a given period of time.

Material stores accounts are charged with the actual cost of raw materials purchased and credited with the amount consumed in manufacturing, priced at actual cost. Applied material account is charged with the actual cost of materials consumed and is credited with the amount of the consumption priced at the standard cost used in the predetermined cost by styles, which amount becomes a charge to stock in process.

A debit or credit balance in the applied material account is represented by the over or under-estimation of material costs. At the end of the year this difference should be treated as an increase or decrease to the stock in process, finished goods and cost of sales accounts, in order that the inventory accounts may be kept on a cost basis and that the cost of sales accounts may reflect the actual cost of the goods sold.

As explained above, it is possible to standardize material costs, but manufacturing conditions occasionally tend to cause a fluctuation in this item during the actual production of the goods. For example: The predetermined cost of a certain style may pro-

vide for a blend of 65 per cent of 30-cent and 35 per cent of 40-cent cotton, and it may be found that in the actual manufacture the cost may be reduced and the quality still be maintained by blending the stock as follows: 70 per cent of 30-cent and 30 per cent of 40-cent cotton, thus reducing the material cost by 1/2 cent per pound.

The difference may be applied to these accounts upon the basis of the value of the materials in each account. For example: The total material charges may have been \$100,000 for the period, of which \$50,000 may be in the cost of sales and \$25,000 each in stock in process and finished goods. Hence an over-estimation would be charged to these three accounts in the proportion of 50 per cent, 25 per cent and 25 per cent, respectively. An under-estimation would be credited in the same ratio.

The value of perpetual inventories of all raw stock in pounds by grades, as well as in dollars and cents, is recognized by the factory as well as the financial management. The superintendent must be able to procure information in this connection quickly and accurately, in order that he may be able to calculate his production orders and deliveries of finished goods. These records may be kept upon card or loose-leaf forms. In the accounting department the stock records reconcile with the stores accounts, so that the books reflect the value of the cost of the inventory.

WASTE CONTROL

Waste cost is determined through the medium of the percentage of net waste, which is a percentage based upon the amount of gross waste loss at each production point, taking into consideration the gross waste and the amount received for the waste sold as a credit. The example on pages 7 and 8 shows how this method is operated.

COTTON COST

	Cotton Opened		Waste Made	
	Pounds	Amount	Pounds	Amount
	25,000	\$10,000.00	5,000	\$ 750.00
	30,000	11,400.00	6,600	1,056.00
	35,000	14,700.00	7,350	1,029.00
Total Cotton Opened.....	90,000	\$36,100.00	18,950	\$2,835.00
Less: Waste	18,950	2,835.00		
NET COTTON	71,050	\$33,265.00		
Cotton Cost in Bale .....				.4011
Cotton Cost in Cloth .....				.4682
Per Cent Gross Waste				21.06%
Per Cent Net Waste.....				14.33%

Formulas:

$$\begin{array}{r} \text{Cotton Cost in Bale} \\ \$36,100.00 \\ \hline 90,000 \end{array} = .4011$$

$$\begin{array}{r} \text{Cotton Cost in Cloth} \\ \$33,265.00 \\ \hline 71,050 \end{array} = .4682$$

$$\begin{array}{r} \text{Gross Waste} \\ 18,950 \\ \hline 90,000 \end{array} = 21.06\%$$

$$\begin{array}{r} \text{Net Waste} \\ .4011 \\ 100\% - \frac{\quad}{.4682} \end{array} = 14.33$$

It is impossible to eliminate waste entirely in a textile mill, but it is possible to detect and control it. If records and methods detect and locate the sources of waste, a signal is displayed, so to speak, which attracts attention to conditions which may be improved or remedied.

DIRECT LABOR AND EFFICIENCY STANDARDS

Because of the continuity of progression and inasmuch as the human as well as the machine efficiency can be measured, a cotton mill lends itself readily to a piece-work wage system. Standard rates are determined based upon past performances, a study of operations and the flow of production, taking into consideration the kind, grade and length of the staple of the cotton processed. The rates determined are based upon the standard percentages of efficiency of the production flow at the various processes. Under this plan detailed analysis does not become involved, and it is comparatively simple to show the production in parallel with the labor for a period.

PRODUCTION REPORTS

Production reports are provided for each department and process, upon which are recorded the pounds by classes of production, the direct labor, the standard and actual percentage of efficiency. These reports are forwarded to the accounting department weekly and the labor figures shown thereon must agree with the departmental payrolls.

The weekly production report of the carding department has the following columns arranged in the order as listed: Frame number, staple, hank roving, number of spindles, number of hanks, actual production, normal production, per cent efficiency, direct labor and indirect labor.

The weekly production report of the weaving department has the following columns: Style, looms run, average looms run, yards woven, normal production, per cent efficiency, direct labor and indirect labor.

The methods of determining the production at the various processes should be investigated from time to time to ascertain that those productions which are obtained by means of hank clock or theoretical calculations are correct. Whenever possible, the product should be actually weighed, but often this is impractical where the materials are placed upon spools or beams.

The production point of each department is that process at which the product has reached a certain stage of manufacture which can be transferred to the next process or department. For example: The production point of the carding department might be the slubbers or fine jacks. For the spinning department the spooling and warping processes are sometimes used as the production point; this feature, however, depends upon the nature of the materials being manufactured.

PRODUCTION ORDERS

Production orders are issued to each department of the mill covering the requirements of raw cotton, rovings and yarns for each style to be manufactured. As the work is completed, records are made by each overseer showing the pounds of materials delivered to him and the pounds of stock which he produced from it and delivered to the following department. As these records are received by the cost department, they are assembled in such a manner that perpetual inventory records are kept by departments, as well as an accurate waste record. Separate departmental records are kept. To the inventory at the beginning in pounds are added the pounds of materials received from the previous department and pounds delivered to the following department are deducted; thus, a record is kept showing the pounds of stock by grades in inventory at all times. The book inventory shown in the stock in process account is proved by extending the pounds by the cost.

BURDEN DEVELOPMENT

The establishment of a basis for accounting and distribution of overhead expenses cannot be accomplished without a thorough study of manufacturing conditions. The first step necessary is a recognition of the functional units of the plant. These are separated into two main divisions—productive and non-productive. The former contributes directly to the manufacture of the output, and the latter represents those departments that are necessary to the maintenance of the manufacturing departments, which expense is redistributed over the productive departments.

<i>Non-Productive</i>	<i>Productive</i>	<i>Commercial Expense Departments</i>
Power Plant	Carding	Selling
Repair Department	Spinning	Administrative
Factory Office	Slashing	Etc.
General Factory	Weaving	
	Finishing	

The accounts recommended in connection with the expense classification are shown in the chart of accounts beginning with number 500 and up (see page 18). These should be distributed upon some sound principle. The following bases of distribution are suggested:

Variable Burden: Variable burden is composed chiefly of indirect labor, power, heat, light, repairs, maintenance and general factory.

Indirect Labor: Factory indirect labor is distributed through payroll analysis to the responsible departments.

Power: Horsepower demand based upon normal running time.

Heat: Square feet of heat radiation surface by departments.

Light: Proportionate wattage demand of each department.

Mill Supplies: Charged to stores. Distribution by requisition.

Fixed Charges—Taxes: Local property taxes are predetermined and distributed on the basis of value of machinery and equipment by departments.

Insurance: Covering fire, use and occupancy, etc., distributed on basis of plant investment by departments. Compensation insurance is distributed on basis of payroll. Boiler insurance is charged to power department.

Depreciation: Distributed on basis of value of buildings, machinery and equipment in each department.

Interest on Investment: Should be based on all the assets used in the business, less reserves for depreciation and bad debts, and distributed on basis of total assets by departments.

EXPENSE LEDGER

The expense ledger is an analysis of the burden, an account being set up for each class of expense and for each non-productive and productive department.

The expense accounts are distributed as explained under "Burden Development" and the responsible non-productive as well as the productive departmental expense accounts are charged. The non-productive departmental expense accounts are then redistributed to the productive expense accounts, which are closed into the applied burden account in total. Analysis sheets upon which the distribution of the expense items are made are employed, separate sheets being used for each class of expense. These analyses become the basis of the journal entries and are attached to the journal vouchers.

The accumulation of the burden in the productive departmental accounts provides a basis for burden budgets to be used in the predetermination of burden rates, and also for the comparison of standard rates based on previous periods with current rates. This current comparison makes it possible to adjust rates to comply with variations which may occur from time to time. In the preparation of standard burden rates, the recorded history of the expenses of previous periods should not be adhered to if conditions are known to exist or may be foreseen which will tend to

bring about essential changes in the necessary expenditures. Such adjustments should be made before the rates are employed in the estimation of selling prices.

Stock in process is charged with raw material, direct labor and burden, and credited with the value of the production of the period at standard cost. The cost of the fabric finished is transferred from the stock in process account to the finished goods account in the general ledger.

Sales of waste account is charged and the stock in process accounts credited with the amount received for all waste sold during each period.

The various production departmental expense accounts are closed out and charged to the applied burden account in the general ledger. The credit to this account is represented by applied burden based upon "pre-determined" rates, thereby effecting a comparison between "actual" rates and pre-determined rates.

At the end of each month a "burden rate" is determined by dividing the total burden by the normal hours for the period. The idle hours extended at this rate is the amount to be credited to the applied burden account and charged to idle plant. Since this amount is based upon the actual and not the standard burden, no adjustment is required at the end of the year.

After giving effect to the adjustment for idle plant, any balance remaining in the applied burden account would represent fluctuations in operating efficiency. For example, if the burden has been over or under-applied, theoretically, this would be the direct result of increased or decreased efficiency, or, in other words, the production would have been above or below normal. From a more practical standpoint, however, there are other conditions to consider; for instance, increase of certain of the indirect labor rates; insurance rates might fluctuate or there might be unexpected increases or decreases in tax rates at some intermediate period when it would not be possible to adjust the standards. Obviously, such variations would influence inventory valuations and necessitate replacing the standard by actual costs. This is not difficult when the burden is distributed on the basis of the direct labor method: Assume, for example, that the expense for the period totals \$100,000 and only \$95,000 has been distributed, leaving an undistributed balance of \$5,000. An analysis of the cost records shows the total direct labor to be \$150,000—\$25,000 of this to be work in process, \$25,000 finished goods in stock and \$100,000 applies to the cost of goods sold. The \$5,000 would be distributed in the following proportions: work in process, $16 \frac{2}{3}$; finished goods, $16 \frac{2}{3}$, and cost of goods sold, $66 \frac{2}{3}$ per cent.

It follows that the cost sheet should be increased by the proper percentages and the proper additional charges made to the control account. If care is observed in setting the standards, and if they are under proper control and revised to fit changing conditions, the differences will be comparatively small, in which event

they will be charged or credited to profit and loss. In other words, the standards for all practical purposes will be correct, and theoretically there should be no under- or over-applied burden.

At the end of each period the value of the sales at cost is credited out of the finished goods account and charged to the sales account. Thus the sales account reflects the profit and loss on goods sold.

SUBSIDIARY DEPARTMENTS

Not infrequently subdivisions of manufacturing departments are essential to the proper compilation and distribution of burden. The carding department contains upwards of a dozen or more processes varying in value according to space occupied, investment, power consumption, etc. This condition is also true of the weaving department when many kinds of looms are employed. If accurate costs per unit of production are to be obtained, it will be seen that unless the subdivisions already referred to are made the expenses, when reduced to a time basis, will vary to a marked degree. Whenever subsidiary departments are decided upon as a further subdivision of the manufacturing department, total overhead charges applicable to a department as a whole must be absorbed by the departmental subdivisions.

REPAIRS AND MAINTENANCE COST (APPLICATION OF JOB ORDER SYSTEM)

The repair department is provided with a repair order form to be issued by the overseers or the master mechanic. These orders are numbered in sequence and printed in triplicate; the original to be sent to the foreman of the repair department, the duplicate to be retained by the maker of the order, and the triplicate—which is usually a card—to be sent to the accounting department. Spaces are provided upon the reverse of the triplicate for the posting of labor, materials and burden.

Special repair orders to be used in accumulating the cost of new work are printed or identified by means of captions or special series numbers. In large shops, where most of the equipment and much of the machinery to be used in the plant are built, this feature is of great importance. These orders are handled in the same manner as the regular repair orders, except that when they are received in the accounting department they must be segregated and the cost of these capital expenditures journalized to the proper asset account. It is sometimes rather difficult to define the exact difference between a capital and a revenue expenditure. Usually a knowledge of the particular conditions concerning the work accomplished and its effect is necessary in arriving at a decision, but generally the following definition is found to apply: Expenditures which increase the value or the earning power of buildings, machinery or equipment become assets and should be capitalized.

Wherever practicable, a special room should be provided for

a stores department, where all incoming materials can be received and given out to the various departments only upon requisition. Two requisition forms should be provided—one to be used by overseers and foremen in drawing indirect supplies and the other to be used only by the repair department for materials to be charged to work orders. The workmen in the repair department are provided with weekly time sheets with columns suitable to the recording of job numbers, hours, rates and amounts. These are usually filled in by the workmen themselves, or in the case of large shops by a special clerk provided for this purpose.

The accounting department posts the labor from the mechanic's time sheet and the material from the stores requisitions to the repair orders. At the end of each period a summary is made showing the total charges to the various departmental accounts. Thus an actual repair departmental expense is determined.

The requisitions for supply material are summarized by departments, and the value of the supplies consumed determined. These are also passed through the books of account and charged to the various expense accounts. A card or loose-leaf ledger is prepared for the stores department and a record of the receipt and issue of all supplies recorded thereon. Each card or ledger page represents a bin or compartment and should always show an inventory by units and value. A systematic check can easily be made to prove this inventory, by counting the units in a certain number of bins currently and comparing the results with the card records.

A chart of accounts to be used in the identification of charges for supplies and repairs is prepared. This chart provides for the combination of department and sub-account keys, which may be combined to indicate accurately the location of the expenditure.

An example of the method of numbering these accounts is shown below:

CHART OF ACCOUNTS

To be used in the Supplies and Repair Department

DEPARTMENTS

- 1 Picking
 - 2 Carding
 - 3 Spinning
 - 4 Warping
 - 5 Weaving
 - 6 Finishing
 - 7 Power Plant
 - 8 Repair Department
 - 9 Factory Office
 - 10 General Factory
- Etc.

SUB-ACCOUNTS

- 01 Opener Pickers
- 02 Breaker Pickers
- 03 Finisher Pickers
- 04 Cards

- 05 Sliver Lappers
- 06 Ribbon Lappers
- 07 Combers
- 08 Drawings
- 09 Stubbers
- 010 First Intermediate
Etc.
- 050 Air, Steam and Water Lines
- 051 Electrical Wiring
- 052 Motors—Electric
- 053 Line Shafting and Transmission
- 054 Elevators
Etc.

Example of Combination of Keys: Repair or Supply Charges to Combers in the Carding Department are indicated by the key 207. Charges to Motors, in the Power Plant, 7052.

PREDETERMINATION OF COST BY STYLE

A sample cost estimating sheet is shown on page 15.

The first consideration is the specifications or construction of the style to be costed, which data is shown at the top of the form. The warp and filling in a yard of cloth are not often equal in weight, so that it is necessary to determine the exact proportion of each ingredient which enters into the construction of the fabric. This is determined by a theoretical calculation of the weight of each kind of yarn in the warp and filling. The formulas for these calculations follow:

WARP

$$\frac{\text{Ends} \times \% \text{ Takeup} \times \% \text{ Size} \times 36}{840 \text{ Yds. in 1 Hank} \times \text{No. of Yarn} \times 36} = \text{Weight of Warp in One Yard.}$$

FILLING

$$\frac{\text{Picks per Inch} \times \text{Width in Reed} \times 36}{840 \times \text{No. of Yarn} \times 36} = \text{Weight of Filling in One Yard.}$$

The cost of various staples of cotton entering into the manufacture of the yarns in the warp and filling are divided by the difference between 100 per cent and the percentage of net waste, which results in the cost of the cotton in the cloth. Direct labor and burden cost per pound of the preparation spinning and warping and quilling departments are added to the material cost of the warp and filling; the total being the total cost per pound of warp and filling ready for the loom. The warp and filling costs are now combined in ratio to the total weight of warp and filling as determined above, which results in the total cost of yarn in one pound of cloth. This figure must be divided by the yards per pound to arrive at the cost of the yarns per yard. The weaving and finishing direct labor and burden is added to the yarn cost, which results in the manufacturing cost of the finished fabric per yard.

The administrative and selling expense is added and this result divided by the difference between 100 per cent and the estimated profit will give the selling price.

COST SHEET

Date, June 1, 1923.

STYLE NO. 500

Width	40"	Takeup	4%		Yarn No.	No. of	Lbs.	
Sley	88	Size	5%	Warp	60	Ends	per Yd.	%
Pick	80	Reed	42.6	Filing	100	3450	.0767	65
		Yards Per Lb.	8.53			3200	.04056	35
					Yards Per Cut		64.11	

MATERIAL COST

Kind	Cost Per Lb.	Net Waste	%	Cost in Cloth	Warp	Filling
1¼	.40	14%		.4651		
1⅜	.35	14%		.4070	.4651	.4070

PREPARATION

Total Labor Cost		Warp	Filling
Burden—Rate 80% .....		.03270	.03986
		.02616	.03189

TOTAL PREPARATION COST..... .05886 .07175

SPINNING

Total Labor Cost.....	.05135	.08864
Burden—Rate 65%.....	.03338	.05762

TOTAL SPINNING COST..... .08473 .14626

TOTAL COST YARN..... .60869 .62501

COST IN CLOTH39565 .21875

TOTAL COST YARN IN CLOTH PER POUND..... .61440

COST YARN IN CLOTH PER YARD..... .07203

WEAVING

Weaving—Labor .....	.1207	
Burden—Rate 70% .....	.0845	.2052

COST OF WOVEN CLOTH PER YARD..... .27723

FINISHING

Finishing—Labor .....	.0048	
Burden—Rate 75% .....	.0036	.2052

COST OF FINISHED CLOTH PER YARD..... .28563

ADMINISTRATIVE EXPENSES.... 12% .03428

SELLING EXPENSE 6% .01714

TOTAL COST33705

PROFIT 8% .02931

.36636

MONTHLY OPERATING AND PROFIT AND LOSS STATEMENT

The profit and loss statement is prepared from the general ledger accounts and is so arranged that gross and net profit from operations are shown separately. A model form appears on page 16.

STATEMENT OF OPERATING AND PROFIT AND LOSS—MONTHLY

Sales:
Sales of Cloth
Sales of Waste
Other Sales
Total Gross Sales
<i>Less:</i> Returns and Allowances
<i>Net Sales</i>
Cost of Sales:
Direct Materials
Direct Labor
Prime Cost
Burden
Total Manufacturing Cost
<i>Operating Profit</i>
Commercial Expense:
Selling (Detail)
Administrative (Detail)
<i>Total Commercial Expense</i>
Adjustments:
Idle Plant
Over or Under Applied Materials
“ “ “ Labor
“ “ “ Burden
<i>Net Profit</i>
Financial Expense and Income:
Discounts Taken
Interest Earned
<i>Less:</i> Interest Paid
Discount Allowed
NET INCOME

INVENTORIES STANDARDIZED

In plants where a system such as is discussed herein is in operation, it is only necessary to take an actual physical inventory but once each year, and then for adjustment purposes only. The taking of a physical inventory in a textile plant is a task not to be attempted by a novice. Cotton is evasive in form, changing continuously from a loose mass of matted fibres to a soft, rope-like coil, thence through processes of twisting until finally the yarn is finished and ready to be woven.

If hank clocks are used upon the fine speeders, all of the roving which has passed from the creel on to the bobbins would have been reported in the production records as production for that process. In taking a physical inventory, therefore, the finished roving on bobbins would be the production for the next department, while the roving on the creels should be considered in the carding inventory.

Various packages and containers peculiar to the nature and form of the materials at the several processes are employed. These range from iron rods, upon which the picker and card laps are carried, and fibre or steel cans in which the roving is wound, to bobbins, spools and packages containing the spun yarns.

In a large plant where thousands of spindles are operated,

and much stock is in process on the machine, it is impractical to weigh each package or container. Consequently standards are prepared and the quantities determined on this basis. For example: In the spinning department a test is made to determine the standard weight of each kind of yarn upon bobbins. A number of empty bobbins, usually one hundred of each kind, are weighed, this being the tare. Then the same number of full bobbins are weighed, the tare deducted and the net weight of yarn divided by the number of bobbins weighed, thus arriving at a standard weight of the yarn upon one bobbin. This method is followed in the case of each package and kind of yarn. When an inventory is taken, it is only necessary to count the number of packages and multiply by the standard weight of yarn upon each package to arrive at the total weight.

CHART OF ACCOUNTS—GENERAL LEDGER

The following is a chart of accounts:

ASSETS

CURRENT:

Cash

- 1 Bank Accounts
- 2 Petty Cash—Imprest Fund

Notes and Accounts Receivable

- 10 Notes Receivable
- 11 Notes Receivable—Discounted (Credit Account)
- 12 Accounts Receivable
- 13 Trade Acceptances Receivable
- 14 Consignment Account Receivable

Inventories

- 20 Raw Materials Stores
- 21 Stock in Process
- 22 Finished Goods—Stores
- 23 Supply Stores
- 24 Fuel Stores

Investments

- 30
- 31

FIXED:

- 40 Land
- 41 Buildings
- 42 Machinery and Equipment—Plant
- 43 Office Furniture and Fixtures
- 44 Trucking Equipment

DEFERRED CHARGES:

- 50 Prepaid Taxes
- 51 Prepaid Insurance
- 52 Prepaid Interest
- 53 Prepaid Expenses

LIABILITIES

CURRENT:

- Notes and Accounts Payable
- 60 Notes Payable—Customers
- 61 Notes Payable—Others
- 62 Accounts Payable
- 63 Labor Accounts Payable

Accrued Accounts
70 Accrued Taxes
71 Accrued Interest
72 Accrued Expenses

Reserves
80 Reserve for Taxes
81 Reserve for Depreciation (by Classes)
82 Reserve for Contingencies

FIXED:
90 Mortgages

CAPITAL:
100 Common Stock
101 Preferred Stock

PROFIT AND LOSS AND SURPLUS:
110 Idle Plant
111 Inventory Adjustment
112 Current Profit and Loss
113 Profit and Loss
114 Surplus

INCOME AND EXPENSE ACCOUNTS

SALES:
120 Sales of Cloth
121 Sales of Waste
122 Other Sales
123 Returns and Allowances (Debit Account)
124 Discounts Allowed.

COST OF SALES:
130 Applied Material
131 Applied Labor
132 Applied Burden
133 Expense Ledger Control

COMMERCIAL EXPENSE:
140 Selling Expenses
141 Administrative Expenses

OTHER INCOME AND EXPENSES
150 Interest Received
151 Interest Paid

EXPENSE LEDGER

DIRECT LABOR:
500 Direct Labor

EXPENSE ACCOUNTS:
600 Taxes
601 Insurance
602 Depreciation
603 Indirect Labor
604 Salaries
605 Office Expense
606 Telephone and Telegraph
607 Stationery and Printing
608 Freight and Express
609 Trucking

NON-PRODUCTIVE DEPARTMENTAL EXPENSE ACCOUNTS:
700 Power Plant
701 Repair Department
702 Factory Office
703 General Factory

PRODUCTIVE DEPARTMENTAL EXPENSE ACCOUNTS:

800 Carding Expense
801 Spinning “
802 Slashing “
803 Weaving “
804 Finishing “

Vol. I

No. 7—Accounting for By-Products, *Research Dept. N. A. C. A.*

Vol. II

No. 7—Purchase Orders and Purchase Records, *Homer N. Sweet*

No. 9—Cost Accounting for Public Utilities, *E. D. Bistline*

No. 15—What Is Wrong with Cost Accounting? *G. Charter Harrison*

No. 16—A Method of Distributing Factory Payroll, *Matthew Porosky*

No. 17—Coal Production Costs, *R. W. Gardiner*

No. 18—Uniform Cost Accounting Methods in the Printing Industry, *W. B. Lawrence*

No. 19—A Cost System for an Electric Cable Plant, *Fred F. Benke*

Vol. III

No. 4—Some Cost Problems in the Hawaiian Sugar Industry, *F. A. Haenisch*

No. 6—Some Phases of Cost Accounting in the Chemical Industry, *C. B. E. Rosén*

No. 7—Cost Accounting in the Soap Industry, *William C. Koch*

No. 9—Methods of Accounting for Waste in a Cotton Spinning Mill, *George D. Klimmer*

No. 10—List of References on Interest as an Element of Cost

No. 11—The Scrap Problem, *I. W. Kokins*

No. 16—Distribution of Operating Costs of Centralized Power Plants at Low Capacity, *Frank B. Wolfe*

No. 19—Normal Burden Rates, *Charles Van Zandt*

Vol. IV

No. 2—Woolen Mill Costs, *Clinton W. Bennett* (out of print)

No. 3—First New England Regional Cost Conference.

No. 4—Cost Accounting in the Manufacture of Iron and Steel Sheets, *Keith B. Woods* (out of print)

No. 5—Steamship Operating and Terminal Costs, *Joseph J. Mulhern and Urbain Robert*

No. 6—Cost Practices and Problems in the Production of Coke, *C. C. Sheppard*

No. 7—Production Costs in the Manufacture of Phonograph Records, *C. J. Borton*

No. 8—Cost Problems in the Wrought Iron Industry, *Carl G. Jensen, Comp.*

No. 9—Prices Profits and Production, *A. F. Stock and M. B. Gordon* (out of print)

No. 10—Cost Accounting for Cranes and Hoists, *P. E. Stotenbur*

No. 11—Cost Accounting in the Tool Steel Industry, *John J. Keefe*

No. 12—Cigar Manufacturing Costs, *A. H. Berman* (out of print)

No. 13—War-Time Depreciation in Open Hearth Steel Plants and Rolling Mills, *J. I. Rodale* (out of print)

No. 14—Papers and Discussion—Second New England Regional Cost Conference (out of print)

No. 15—Principles and Practice of Construction Cost-Keeping. Part II—Analyzing Costs, *William M. Affelder*

No. 16—Standard Costs—How to Establish and Apply Them. *William F. Worrall*

No. 17—A Method of Collecting Direct Labor Costs and Statistics, *George H. Friesel*

No. 18—Cost Accounting for Self Laying Track Tractors, *Percy Ehrenfeldt*

No. 19—Papers and Discussions—Third New England Regional Cost Conference

No. 20—Radio Educational Campaign

No. 21—Cost Accounting in Relation to Business Cycles, *John R. Wildman*

No. 22—Cotton Mill Costs, *W. A. Musgrave*

Copies of the above publications which are not out of print may be obtained from the office of the Secretary of the Association, 130 W. 42nd Street, New York City, at the price of 75 cents per copy.