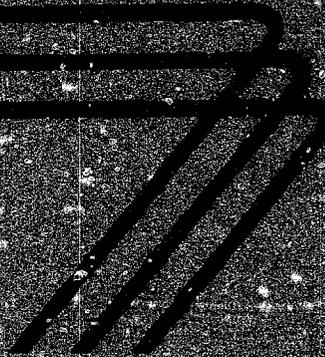
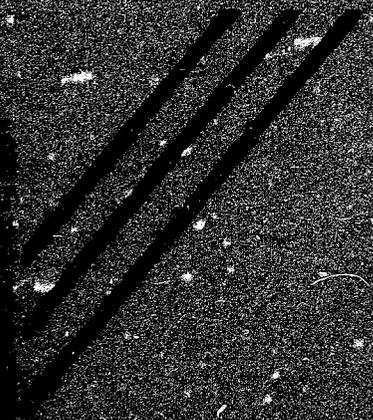


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PLANT REQUIREMENTS FOR MANUFACTURE OF STANDARD SPORTS STOCKINGS



DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
COMMUNICATIONS RESOURCES DIVISION
Washington 25, D. C.



U.S. GOVERNMENT PRINTING OFFICE
1964 O - 348 200

FOREWORD

This brochure is one of a series of reports resulting from overseas technical inquiries on factory or commercial establishments, operation, management, and engineering. The report is designed to provide only a general picture of the factors that must be considered in establishing and operating a factory of this type. In most cases, plans for actual installations will require expert engineering and financial advice in order to meet specific local conditions.

Mention of the name of any firm, product, or process in this report is not to be considered a recommendation or an endorsement by the Agency for International Development, but merely a citation that is typical in its field.

This report was prepared by the George H. Andrews Engineering Associates, Inc., 411 Southern Building, Washington 5, D. C., in March 1961 for the technical aids program through the facilities of the Office of Technical Services, U. S. Department of Commerce.

* * * * *

For further information and assistance, contact should be made with the local Productivity Center, Industrial Institute, Servicio, or United States AID Mission.

Code Number
PR-100

March 1962

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Industrial Consultant
126 Eleventh Avenue
New York 11, N. Y.

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MEN'S BASEBALL AND SOCCER STOCKINGS

INTRODUCTION

The purpose of this report is to present basic information for establishing and operating a small plant in a foreign country for the manufacture of men's stockings to be used by baseball and soccer players. Boy scouts sometimes wear these stockings. All stockings of this type are made by the knitting process.

GENERAL ASSUMPTIONS

In order to make realistic estimates, certain assumptions must be made. These are:

1. The costs of building, equipment and material necessary are based on United States prices.
2. Labor costs used are the average for the industry and skill described, based on recently published figures of the United States Bureau of Labor Statistics.
3. All other costs, statistics and figures are based on current United States prices.
4. Adequate heat, light, water and electricity are available at the plant site.
5. Adequate transportation facilities are available at the plant site.
6. The plant operates eight hours a day, five days a week, fifty weeks a year.
7. No special provision is made for training of personnel. It is assumed that persons learning their jobs will be paid learners' rates.

8. The following items cannot be estimated realistically:

- A. Land value
- B. Distribution and selling costs
- C. In-freight and out-freight
- D. Administrative costs
- E. Taxes

While general estimates will be made of each of these items, for the purpose of completing cost estimates, adjustment should be made in accordance with actual local costs.

In fact, all cost estimates contained in this report should be adjusted to conform to local conditions.

Columns are provided in the tables in this report to facilitate the conversion of cost figures to conform with local costs.

PRODUCT SPECIFICATIONS

All information and figures contained in this report are based on the production of cotton stockings for baseball and soccer players. The average weight of one pair of stockings is $4\frac{1}{2}$ ounces. Therefore this weight will be used for estimating material requirements.

PRODUCTION CAPACITY

The plant has an annual capacity of 30,000 dozen pairs of stockings per year based on operating one eight hour shift per day. The production capacity can be increased by working additional shifts without increasing the capital investment.

MANUFACTURING UNIT

The manufacturing unit for these stockings is one dozen pairs.

MANUFACTURING OPERATIONS

The method of knitting men's cotton stockings for use by baseball and soccer players is not a complex one. The process is practically the same as that followed in the manufacture of other types of knitted hosiery except that no foot is knitted. Instead of that, a strap or stirrup is made from a piece of cotton tube knitted on the same type of machine.

Bleaching and dyeing

Generally, the yarns are bleached and dyed to produce stockings colored to the individual customer's orders. The yarns are placed in nets, then put into a bleaching solution in open or rotary vats and then rinsed. The yarns are then placed in a dye solution and again well rinsed. After the final rinse the remaining water is rinsed in a centrifugal extractor.

Knitting

The cotton yarn is knitted by multiple needles into a tubular form by a machine that picks up as many loops of yarn as are required to reach around the tube being knitted. The entire circle of loops is made at the same time. This is followed by making another circle of loops and the process is repeated. Another type of knitting machine is used for flat surface knitting but that type is not required for the manufacture of stockings.

Turning

The completed tube must be "turned" and pulled over a board for inspection.

Mending

If mending is required the stocking is routed to the place for that operation.

Boarding

In this process the knitted tube is pulled over a series of forms. These forms are made of aluminum or stainless steel and are made hollow. They are heated by steam introduced to the inside. These are made in various sizes but for the purpose of this report only the average adult size is estimated. The forms are interchangeable when the various sizes are made.

Sewing

This process covers the sewing of the strap to the bottom of the stocking.

Finishing

This part of the manufacturing process is divided as follows:

Transfer is the application of small pieces of decalcomanias.

A hot iron is used in making the transfer.

Put on rider - A glued label is applied at the top to keep the stockings together in pairs.

Fold and box - The stockings are folded and placed in boxes and the boxes are placed in cartons. This operation is followed by transfer of the cartons to stock in the storage room.

Storage - From this storage or stock room the boxed stockings are shipped as required.

* * * * *

DIRECT MATERIALS

The direct materials required for the manufacture of stockings produced in this plant include the following:

<u>Item</u>	<u>Unit</u>	<u>Number Units</u>	<u>Unit Cost</u>	<u>Annual Cost</u>	
				<u>Estimated</u>	<u>Actual</u>
Cotton yarn	pound	96,000	\$ 0.68	\$ 65,280	_____
Chemicals, dyes	pound	9,500	1.60	15,200	_____
Boxes		62,400	.05	3,120	_____
Cartons		2,000	.20	<u>400</u>	_____
TOTAL				\$ 84,000	_____

SUPPLIES

<u>Item</u>	<u>Annual Cost</u>	
	<u>Estimated</u>	<u>Actual</u>
Lubricants	\$ 100	_____
Needles	500	_____
Repair parts	500	_____
Maintenance materials	700	_____
Office supplies	<u>200</u>	_____
TOTAL	\$ 2,000	_____

DIRECT LABOR

<u>Job Classification</u>	<u>Number Needed</u>	<u>Hourly Rate</u>	<u>Annual Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Knitters	3	\$ 1.75	\$ 10,500	_____
Looper operators	5	1.75	17,500	_____
Turners	2	1.50	6,000	_____
Bleacher and dyer	1	2.00	4,000	_____
Boarders	2	1.75	7,000	_____
Finishers and stitchers	<u>2</u>	1.75	<u>7,000</u>	_____
TOTAL	15		\$ 52,000	_____

INDIRECT LABOR

<u>Job Classification</u>	<u>Number Needed</u>	<u>Hourly Rate</u>	<u>Annual Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Manager	1		\$ 8,000	_____
Bookkeeper	1		5,000	_____
Secretary-clerk	1		3,600	_____
Fixers	1	\$ 2.00	4,000	_____
Mending and utilities	1	1.50	3,000	_____
Receiving and shipping	<u>1</u>	1.60	<u>3,200</u>	_____
TOTAL	6		\$ 26,800	_____

PRODUCTION TOOLS AND EQUIPMENT

<u>Item</u>	<u>Number Needed</u>	<u>Unit Cost</u>	<u>Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Knitting machine	20	\$ 2,775	\$ 55,500	_____
Elastic top attachment	10	300	3,000	_____
Packing charge	20	50	1,000	_____
Motor and transmissions	1	2,000	2,000	_____
Loopers	2	300	600	_____
Motor	1	50	50	_____
Rotary dye vat - 25 pounds	1	2,500	2,500	_____
Motor	1	350	350	_____
Extractor - 30 inch	1	2,000	2,000	_____
Motor	1	50	50	_____
Turning board	1	50	50	_____
Boarding table	1	200	200	_____
Sewing machines	2	350	700	_____
TOTAL			\$ 68,000	_____

OTHER TOOLS AND EQUIPMENT

<u>Item</u>	<u>Number Needed</u>	<u>Unit Cost</u>	<u>Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Racks, tables, baskets, work bench, small tools, trucks and chairs.		\$ 1,200	\$ 1,200	_____
Piping and wiring for equipment		1,800	1,800	_____
TOTAL			\$ 3,000	_____

FURNITURE AND FIXTURES

<u>Description</u>	<u>Number Needed</u>	<u>Unit Cost</u>	<u>Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Desks and chairs	2	\$ 150	\$ 300	_____
Typewriter	1	150	150	_____
Adding machine	1	150	150	_____
Filing cabinets	2	100	<u>200</u>	_____
 TOTAL			\$ 800	_____

PLANT LAYOUT

A plant layout, showing the location of machinery and equipment is shown on page 24.

PLANT SITE

To provide for eventual expansion about 10,000 square feet of level, well drained land is required. The site should be as advantageously located as possible with respect to transportation facilities, power, water, fuel, sources of labor and markets. The cost of the site is estimated at \$1,000.

BUILDING

To provide for some expansion a one-story building 30 feet by 128 feet or 3,840 square feet will be required. The building may be constructed with any suitable local material. The cost of the building including a suitable boiler, adequate plumbing and wiring is estimated at \$4.00 per square foot or \$15,360. In the procurement of the boiler the availability of local fuel should be considered.

POWER

The annual cost of power for all purposes is estimated at \$600.

WATER

The annual cost of water for production, sanitation and fire protection is estimated at \$200.

FUEL

The annual cost of fuel for production purposes and heating the building is estimated at \$300.

* * * * *

DEPRECIATION

<u>Item</u>	<u>Estimated Cost</u>	<u>Years Life</u>	<u>Annual Cost</u>	
			<u>Estimated</u>	<u>Actual</u>
Building	\$ 15,360	20	\$ 768	_____
Production tools and equipment	68,000	10	6,800	_____
Other tools and equipment	3,000	10	300	_____
Furniture and fixtures	800	10	80	_____
 TOTAL			\$ 7,948	_____

MANUFACTURING OVERHEAD

<u>Item</u>	<u>Annual Cost</u>	
	<u>Estimated</u>	<u>Actual</u>
Depreciation	\$ 7,948	_____
Indirect labor	26,800	_____
Power	600	_____
Water	200	_____
Fuel	300	_____
Supplies	2,000	_____
 TOTAL	\$ 37,848	_____

MANUFACTURING COST

<u>Item</u>	<u>Annual Cost</u>	
	<u>Estimated</u>	<u>Actual</u>
Direct materials	\$ 84,000	_____
Direct labor	52,000	_____
Manufacturing overhead	37,848	_____
 TOTAL	\$ 173,848	_____

FIXED ASSETS

<u>Item</u>	Cost	
	<u>Estimated</u>	<u>Actual</u>
Land	\$ 1,000	_____
Building	15,360	_____
Production tools and equipment	68,000	_____
Other tools and equipment	3,000	_____
Furniture and fixtures	800	_____
TOTAL	\$ 88,160	_____

WORKING CAPITAL

<u>Item</u>		Annual Cost	
		<u>Estimated</u>	<u>Actual</u>
Direct materials	30 days	\$ 7,000	_____
Direct labor	30 days	4,333	_____
Manufacturing overhead	30 days	3,150	_____
Reserve for sales collections	30 days	25,000	_____
TOTAL		\$ 39,483	_____

CAPITAL REQUIREMENTS

<u>Item</u>	Cost	
	<u>Estimated</u>	<u>Actual</u>
Fixed assets	\$ 88,160	_____
Working capital	39,483	_____
TOTAL	\$ 127,643	_____

SALES REVENUE

The current selling price for stockings of the type and quality produced in this plant, including allowances for the sale of seconds, will average about \$10.00 per dozen pair.

Based on this sales price per dozen pair, the annual sales revenue would be 30,000 x \$10.00 or \$300,000.

RECAPITULATION OF COSTS, SALES AND PROFITS

<u>Item</u>	<u>Estimated Cost</u>	<u>Actual Cost</u>
Direct materials	\$ 84,000	_____
Direct labor	52,000	_____
Manufacturing overhead	<u>37,848</u>	_____
Total manufacturing cost		\$ 173,848 _____
Interest on loans	3,000	_____
Insurance	500	_____
Legal	1,200	_____
Auditing	2,400	_____
Unforeseen expense	<u>10,052</u>	_____
Total administrative cost		\$ 17,152 _____
Sales commissions		21,000 _____
Freight-out, travel, bad debts, discounts and allowances		6,000 _____
Profit before taxes		<u>\$ 82,000</u> _____
Total annual gross sales		\$ 300,000 _____

BUDGET CONTROL:

A requisition form designed to provide accurate records of procurement and indicate the purpose of procurement with the least amount of time and effort is shown on the following page.

This form has an account number for each type of the various expenditures which the manager will review in detail, monthly or oftener, in order to control his expenses. Some items, such as power and water, are usually under contract and are easily checked by reference to monthly bills. For simplification, items (marked with an asterisk below) are omitted from the purchase requisition. Variations in the labor costs are easily reviewed by examination of the payroll vouchers. The simplified type of control thus provided makes certain that the manager can control expenditures promptly.

Following the requisition form, a sample voucher check is shown. Voucher checks should be used for the payment of all expenditures and the appropriate book account number placed on each voucher.

At the end of each month the manager will receive a statement of all expenditures broken down by budget accounts. If the expenditures exceed the budgeted monthly allowances of any of the accounts, the bookkeeper will furnish the manager with a break-down of all expenditures relative to the budgeted accounts exceeded. All these supporting data can be secured by reference to the purchase requisitions and the check vouchers. This reference will enable the manager to determine what caused the over-expenditure and take corrective action.

If at any time during each month it becomes apparent that expenditures will exceed any of the budget accounts, the bookkeeper will bring this to the attention of the manager for his information and action.

BUDGET CONTROL ACCOUNTS:

Account Number	Monthly Expense	Monthly Budget	Annual Budget	Actual
10 Administrative	\$ _____	\$ 591	\$ 7,100	\$ _____
20 Sales	_____	2,250	27,000	_____
30 Direct Materials	_____	7,000	84,000	_____
40 Supplies	_____	166	2,000	_____
51 Power*	_____	50	600	_____
52 Water*	_____	16	200	_____
53 Fuel	_____	25	300	_____
60 Unforeseen Expense (Reserve Account)	_____	840	10,052	_____
71 Direct Labor*	_____	4,333	52,000	_____
72 Indirect Labor*	_____	2,233	26,800	_____
80 Depreciation (Reserve Account)	_____	662	7,948	_____

R. W. MITCHELL MANUFACTURING COMPANY

1422 BOSWORTH STREET, S. E.

65-22
514

ANYWHERE, U. S. A. _____ 19__ No. **10000**

PAY _____ DOLLARS \$ _____

TO THE ORDER OF

TO **FIRST NATIONAL BANK**
ANYWHERE, U. S. A.

R. W. MITCHELL MANUFACTURING COMPANY

BY **SAMPLE CHECK**

VICE PRESIDENT

ACCOUNT NUMBER

Sample voucher check to be used for the payment of
all expenditures in connection with Budget Control.

R. W. MITCHELL MANUFACTURING COMPANY

ENGINEERS:

The services of professional engineers are desirable in the design of this plant, even though the proposed plant is small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in industrial design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines. They may also be reached through their national organizations, one of which is the

National Society of Professional Engineers
2029 K Street, Northwest,
Washington 6, D. C.

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project.

The equipment manufacturers also know, and can recommend, professional engineers in private practice, who are willing and able to provide appropriate consulting services.

TRAINING:

Manufacturing an inferior quality of product during the training period could create sales resistance that might be difficult to cope with later. To avoid such possibilities, the quality of the product should be maintained at all times, including the training period.

In some areas skilled operators may be available locally. In other areas all the operators may have to be trained.

If skilled operators are not available, adequate training would be assured by using one or more of the following methods:

- A. If the plant is designed and installed by a competent engineering firm, the contract should be negotiated, if possible, on a turn-key basis. On this basis the contractor agrees to operate the plant and produce the quality and quantity of the product stated in the contract for an agreed period of time. Such a contract would assure adequate personnel training, since full quantity and quality could not be produced with an untrained organization.
- B. The engineering firm that designs and installs the plant can usually make training arrangements to have key personnel placed, for training purposes, in a foreign industry that produces the same type of product. This would provide training for the key personnel while the plant is being installed.
- C. If neither of the above methods is possible, then qualified and experienced individuals should be employed for the key positions, either permanently or temporarily, to perform the key operations and assist in training the organization, even if they must be secured outside the country.
- D. The manager should have years of successful experience in this type of business and be fully qualified in all phases of management, including the training of employees.

SAFETY:

There is always danger of accident and injury in any industrial plant. Because of this, the manager should take specific action to bring to the attention of each employee the importance of safety precautions and intelligent first aid.

Practically all machines have safety appliances, and the manager should see that these are in good working condition and that the operators are making full use of them.

In addition to constant watchfulness to make sure that all practicable safety precautions are taken, first aid supplies should be readily available. One complete first aid kit should be maintained near the manager's office, and others at appropriate places throughout the plant. Some of the employees should be trained to provide first aid service.

The use of accident posters in the plant have proved to be of value in reducing accidents. It is recommended that such posters be used, and that some direct special action be taken by the manager, at least once each month, to bring to the attention of all personnel the importance of safety precautions.

A fire brigade should be established and each member trained as to his responsibility in case of fire. Fire drills should be conducted periodically.

It is recommended that the employees be encouraged to offer suggestions or recommendations relative to prevention of accidents, removal of fire hazards and maintaining general interest in all safety factors.

OTHER CONSIDERATIONS

There are other important subjects, shown below, that should be fully investigated and considered. Information on these subjects is usually available from such sources as banks, government agencies, exporters and importers, wholesalers, retailers, transportation companies and manufacturers.

MATERIALS AND SUPPLIES

1. Are all materials and supplies available locally?
2. Is the local material market competitive?
3. Is satisfactory delivery of local materials assured at reasonable prices?
4. What materials and supplies must be imported?
5. Are they available in world markets at competitive prices?
6. Would prompt delivery of imported materials and supplies be assured so that large inventories would not be required?

MARKET FACTORS

1. Is there already a demand for the product?
 - A. Who are the principal consumers?
 - B. Who are possible new consumers?
2. How is demand for the product now satisfied?
 - A. By local production? If so, what is the volume of annual production?
 - B. What percentage of consumption is filled by local production?
 - C. By imports? If so, what is the volume of annual imports?
 - D. What percentage of consumption is met by imports?
 - E. From what areas are imports derived?
3. What is the estimated annual increase in local consumption over the next five years?
 - A. How were such estimates made?
 - B. By reference to official figures on population growth, family budgets, imports, etc.?
 - C. By consultation with trade or industry, ministries, associations, bankers, commercial houses, wholesalers, retailers, industrial consumers, etc.?

4. If the product is already being manufactured, can the existing and estimated future local market absorb production of the new plant without price-cutting or other dislocations?
5. Would the estimated sales price and quality of the new product make it competitive with an imported equivalent?
 - A. After adjusting cost to local conditions, is the estimated sales price of the product so high that tariff protection is necessary to protect it from imports?

EXPORT MARKETS:

1. Could the product compete in export markets on the basis of price, quality and dependability of supply?
2. Can export markets for the product be developed?
3. If so, in what areas and in what annual volume?
4. What procedures would be necessary to develop export markets?
5. What would it cost?

MARKETING PROBLEMS:

1. In calculating costs of the product, has adequate allowance been made for the expense of a sales department, advertising and promotion that might be required?
2. Do consumer prejudices against locally manufactured products exist?
 - A. If so, why?
 - B. Would they apply to the new product?
 - C. If so, how could they be overcome and what would it cost to do so?
3. Do marketing and distribution facilities for the product exist?
 - A. If not, can they be set up?
 - B. What would it cost to do so?
4. Will the product be sold to:
 - A. Wholesalers?
 - B. Retailers?
 - C. Direct to consumer?
 - D. Other industries?
 - E. Government?

ECONOMIC FACTORS:

1. How much foreign exchange (and in what currency) is required to import machinery, equipment and supplies:
 - A. How much foreign exchange (and in what currency) is required for annual interest payments and amortization of any loans contracted to import machinery and equipment, or for payment of royalties and technical services?
 - B. How much foreign exchange (and in what currency) is required for annual import of raw materials and supplies?
 - C. What are estimated annual foreign exchange earnings and in what currencies?
 - D. Has careful consideration been given to the possibility of depreciation in the foreign exchange value of the local currency?
 - E. Has careful consideration been given to the possibility of import controls, or restrictions on availabilities of foreign exchange necessary to operate the business?
 - F. What benefits would the new business bring to the economy in the use of local raw materials: in employment and in technology?
 - G. Do dependable facilities exist for transportation, power, fuel, water and sewage?
 - (1) If not, can existing deficiencies be eliminated satisfactorily?
 - (2) What would be the cost to do so?

PERSONNEL:

1. Is there an adequate labor supply near the plant location?
 - A. If not, how can the problem be solved?
2. Can the problem of training competent management and supervisory personnel be solved?
 - A. Also, the training of skilled labor?
 - B. Is technical advice available in the locality?
 - C. If not, where can it be obtained and what will it cost?

LAWS AND REGULATIONS:

1. Do existing labor laws, government regulations, laws and taxes favor establishment of new business?
 - A. If not, can existing obstacles be removed?
 - B. If so, how and when?

FINANCIAL FACTORS:

1. Technical advice on selection of machinery and equipment.
 - A. In selecting the machinery and equipment for the new plant, have reputable and competent engineers and technicians been consulted?
 - B. Have they been asked for advice on the most suitable types of machinery and equipment for the process and locality?
 - C. Have they carefully compared costs of various suppliers?
 - D. Credit terms offered purchasers?

FINANCIAL REQUIREMENTS OF THE PROJECT:

1. In estimating the cost of the project, has careful consideration been given to:
 - A. The effect on costs of delays in construction schedules?
 - B. In delivery and installation of machinery and equipment?
 - C. In import of essential raw materials and supplies?
2. In calculating cash flow and working capital requirements, has careful consideration been given to:
 - A. Maintaining adequate inventories of raw materials?
 - B. Supplies and spare parts?
 - C. Seasonal fluctuations in the business?
 - D. The time required to liquidate credit sales to customers and bad debts?
 - E. The period necessary to get the plant into production?
 - F. Cash required to amortize its principle loans?
3. If the economy is in a period of inflation, has full allowance been made for the influence of rising prices and wages on the cost of the project and on working capital requirements?

SHORT TERM BANK CREDITS:

1. Has it been possible to make arrangements with local banks to finance short-time working capital requirements of the business?

FINANCIAL PLAN:

1. Has a definite plan to finance the project been worked out?
 - A. Is sufficient capital available locally?
 - B. If not, what is the plan to obtain the required capital?

BIBLIOGRAPHY

Textbook

American Cotton Goods

Textile Book Publishing Co.
303 Fifth Avenue
New York 10, N. Y.

Periodicals

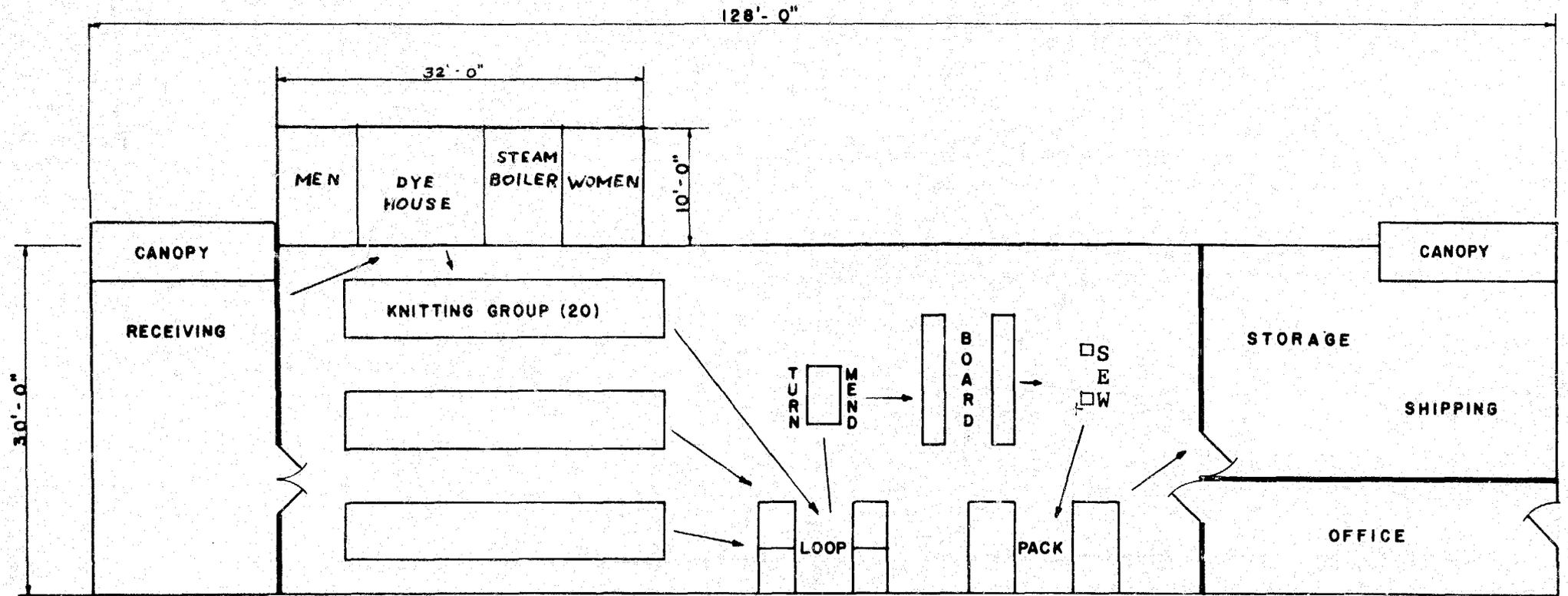
Textile World

McGraw-Hill Book Co., Inc.
330 West 42nd Street
New York 36, N. Y.

Daily News Record

Fairchilds Publishers Inc.
7 East 13th Street
New York 3, N. Y.

PIANT LAYOUT AND WORKFLOW



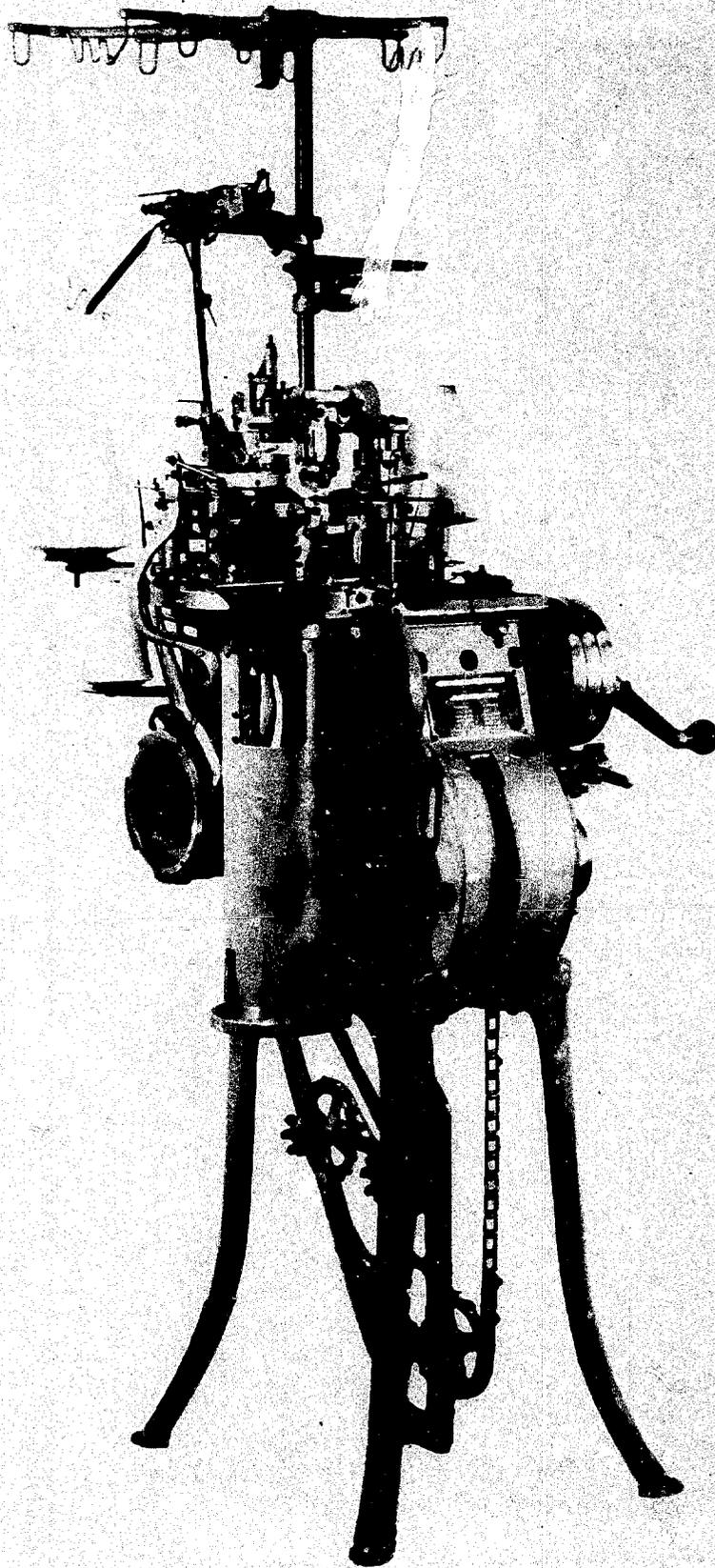


Figure 1
Knitting Machine



Figure 2
Looper

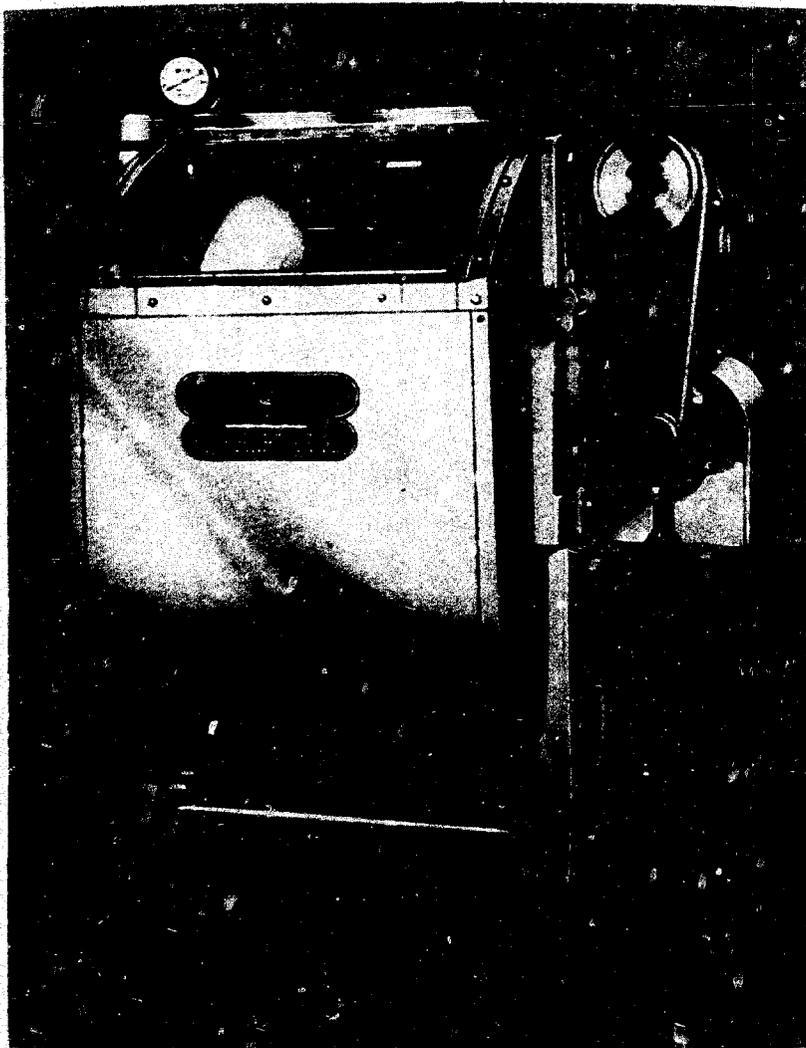


Figure 3
Rotary Yarn
Dyeing Machine

Figure 4
Extractor

