

A COMPARATIVE STUDY OF AHMADU BELLO UNIVERSITY
TEXTILE DESIGN PROGRAMMES AND JOB
EXPECTATIONS OF IT'S GRADUATES
IN THE TEXTILE INDUSTRY

BY

JUMMAI MARYAM ADAMU

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DEPARTMENT OP INDUSTRIAL DESIGN,
FACULTY OF ENVIRONMENTAL DESIGN,
AHMADU BELLO UNIVERSITY, ZARIA

DECEMBER, 1986

DECLARATION

I hereby declare that this project is composed by me and that it has not been submitted else where for the award of any degree. I have fully acknowledged all information derived from materials both published and unpublished by others.

Adamu Jummai Maryam
December, 1986

CERTIFICATION

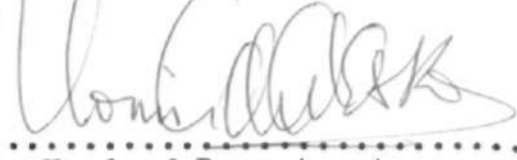
This thesis entitled The Comparative Study of Ahmadu Bello University Textile Design Programme and Job Expectations of its Graduates in the Industry, meets the regulations governing the award of degree of Master of Arts (Industrial Design) of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

DR. S. A. ADETOGBE 
.....
Chairman, Supervisory Committee

29/1/87
.....
DATE

DR. A. O. ABODERIN 
.....
Member Supervisory Committee

29/1/87
.....
DATE

DR. S. A. ADETOGBE 
.....
Head of Department

29/1/87
.....
DATE

.....
Dean, Post Graduate School

.....
DATE

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DEDICATION

To my husband

— Mohammed Mustapha Saidu for his
Love and Understanding

And

To my father Mamman Mustapha Adamu
Whose broad-mindedness and
Desire for education I greatly
Admire

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The completion of this study, was by the assistance guidance and academic backup given by Dr. S.A. Adetoro, the major Supervisor with whom the whole study was carried through from the beginning to the end.

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My sincere appreciation is expressed to all members of my family for their support and encouragement, to my husband for his support and understanding, to Mrs D.B. Ibrahim a friend and a workmate and Mr. Ogunduyile for his contributions.

Finally, Isaac Ogwuche for typing assistance and all who helped in one way or another to make this study a success.

ABSTRACT

Adamu, Jummai Maryam, "A Comparative Study of A.B.U. Textile Design Programme with job expectations of its graduates in the textile industry." Master of Arts in Industrial Design. December, 1986, 176 pages, 93 plates, 42 figures, 13 tables and 57 reference titles.

Uzoagba (1935) with the many schools of thought view education in art or design as a training which prepares one for vocational or professional career. He further observed that careers in art now, have brought- greater demand for technical training in them. The applied designer is generally associated with design field in the textile and commercial industry. However, the initial problem on which this study is based is the inadequate representation of textile design graduates in the textile industries to perform related professional functions.

The main objective of the study therefore has been to examine what is existing in the industry and the extent to which the textile design programme in the academic institution, prepares graduates for different areas of the industry. It was also to identify factors responsible for many of the graduates not employed in the textile industry.

The population for this study consists of all clothing textile industries in the Northern States of Nigeria and textile design programme in A.B.U., Zaria

The samples include two of the textile industries and the textile design programme between 1980 and 1985 from which 100 respondents were selected. Proportional sampling technique was used to select the subjects. A Questionnaire was designed and administered as well as non-participant observation. These were embarked upon in order to achieve the objectives of the study.

The followings are conclusive to the finding of the study:

1. The textile industry employs more of non-graduates than graduates.
2. Textile design programme does not prepare one for jobs in the area of spinning and testing laboratory in the industry.
3. Differences in the tools and equipment used affect the preparation of students for Job openings in the areas of engraving, printing dyeing and weaving.
4. Research findings of the academic institution are not adequately utilised by the industry.
5. There is adequate job preparation for students in the area of design for the industry.
6. Planning and the implementation of textile design programme in the academic institution is not adequate.
7. Students on industrial training are improperly placed in working areas of the industry.

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CHAPTER I

- 1.1. Introduction
- 1.2. Statement of the problem
- 1.3. General Objective
- 1.4. Specific Objectives
- 1.5. Research Questions
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- 1.11. Assumption
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1.1. INTRODUCTION

One of the most important functions of the institutions of higher learning according to Madu (1985) is to develop appropriate manpower for the various requirements of the economy. For this to be effectively performed, each discipline must be analysed with a view to determine areas of need in this respect for appropriate training programme to be formed. That is to say, job market of each discipline must be considered in planning the programme. Thus having textile design graduates in mind, the specific jobs among others that readily

comes to mind is that of the textile industry. Textile industry is here seen as only one avenue among other employment possibilities open to textile design graduates, upon which effective programmes could be planned. In fact, several schools of thought feel that Textile academic curriculum is better developed from the textile industry.

The initial motivation for this study was the employment problem faced by textile design graduates on completion of their programmes in the University. From the result of a pilot study conducted as a follow up study of graduates between 1980 - 1985, graduates were found to have mostly taken up other jobs in the society not related to their field of specialisation such as those of teachers, administrators, bank officials and the like. The few in the industry claim that they are inadequately used and suppressed by restrictions and protocols of the industry while others remain unemployed for a long period. It is in view of this that a study which will find out factors responsible for the unemployment of Textile Design graduates in the industry was considered appropriate. On the whole, the motivating factor stems from personal observation, professional concern and recommendations of other researchers like Buoye (1984) Kparevzue (1983) and Adetoro (1980 and 1984). Buoye (1984) observed that there

was a noticeable difference between design works done by institutions and industries and suggests that institutions should borrow a leaf from their skills and techniques to produce creative designs. Kparevzua (1983), on the other hand, is of the opinion that curriculum specifications should serve as base for developing instructional

materials and programme, as this will help the efforts of adapting to current and future needs of the society and students. She therefore recommended a model curriculum for teaching textile in higher educational institution. There was a general concession that textile design programme should reflect real values of society as well as learners' interest. Adetoro (1980), feels that this will make trainees aware of the challenges they will be facing on completion of their course. Adetoro (1984), therefore made a recommendation for a more comprehensive study into the role that the textile design programme in Ahmadu Bello University should play in providing appropriate job opportunities for its graduates based on its objectives.

Cochrane (1974) recalled that the invention of spinning mule, spinning jenny and power looms in the 1700s marked the beginning of textile making in large scale industries. These could have probably been responsible for the gradual drift of

the practice of textile art from the home to the factories, because people went in there to spin and weave for the mills. The development of industrial art or design in United States of America according to Andrew and Erricson (1976) took its roots from traditional manual apprenticeship training, which is now given an academic background. It is believed that industrial art is based on values derived from manipulative activity and study of industrial materials, life and processes.

It is most probable that economic and social status of textile designers could be improved if graduates remain and practice the skills dominantly by teaching it, working in industry and private establishments such as workshop, cottage industry and cooperatives. Macausland (1950) opined that for better understanding and relationship of practice and institutional textile design programme, institutional programme should attempt to include industrial job related skills in the system. There should be cross fertilisation of ideas between the industry and institution. These would enhance the production of a better trained and educated working force for textile industries as well as solving industrial problems in the country. Research into this type of textile education has been scanty. In United Kingdom, like in U.S.A., Hann (1984) agreed

that the development of textile education is closely related to the changing needs of the industries. Similarly, the general resolutions of the seminar on teaching of textile held in Ahmadu Bello University (1977) suggests that the textile industries in Nigeria, ought to be vital partners in progress with educational institutions. On this note therefore, institutions and industries are advised to come together in the interest of national progress in the field of textiles.

The development of industrial design in A.B.U. was probably due to the idea to further applied art courses from pure aesthetic concepts into design and technology, geared towards employment needs of the industrialising society. Fatuyi (1986) reaffirmed this, as he believed that the old fine art programme in the area of applied art was inadequate in meeting the changing need of the industrialising society, which called for the creation of the department of industrial design. Hassan (1982), however, believes that the department of industrial design was created out of fine art in 1977 when fine arts reached its peak of expansion. From the existing records, the industrial design programme in A.B.U. has a three-year development programme which offers specialisation in the areas of Ceramics, Graphics, Glass Technology and Textile designs. According to

A.B.U. prospectus (1981), Industrial design programme for undergraduate is aimed at teaching students to see, analyse, examine, select and execute problems in different areas of specialisation, consisting of Ceramics, Graphics, Glass Technology and textile designs. From the stated aims of this programme in A.B.U., one can infer that the textile design programme is an academically oriented course directed towards solving immediate students needs rather than preparing students for job opportunities. Adetoro (1984), used a four scaled response mode questionnaire to confirm this on a set of graduating students, who responded that the training they got outside the school on industrial attachment was relevant to their employment needs.

Monroe (1952), saw the importance of goals and objectives in curriculum development, for these provide students with attitudes, understanding and skills necessary for productive participation in contemporary society. Umar (1979) also noted that the best attitude in curriculum planning is by widening its general background to produce students useful to themselves and society. Many schools of thought, therefore believe that the textile design programme should prepare its graduates to fit into a wide range of areas in the industrial world.

A very important aspect of our academic organisation is planning of curriculum. Adetoro (1985) believes that the philosophy behind this is perhaps usually reflected in its goals in agreement with overall institutional guidelines. Olarunmaiye (1985), refers to a participant's comments in the 1965 National Curriculum Conference as these relate to textiles to necessarily contain among others the cooperation of business, government and industry with schools so as to tailor their curriculum to available or projected job market. He further stated that this can only be achieved through a well implemented and defined educational objective. In the textile design programme of A.B.U., implementation is based on individual lecturers discretion to follow the laid down syllabus or not. This situation is different in the Polytechnics where programmes are accredited and evaluated by the National Board for Technical Education.

Apart from all the shades of opinion given by various people, some schools of thought still believe that there are some major discrepancies between the training received by students of A.B.U. textile design programme and type of job requirements for them in the textile industry.

1.2. Statement of the Problem

The problem of this study is the extent of relationship between Ahmadu Bello University textile design programme and employment skills required of graduates for job openings in the textile industry.

The objectives for the study are presented in two categories; general and specific forms.

1.3. General Objective

The general objective of the study is to examine what is existing in the industry and the extent to which the textile design programme in Ahmadu Bello University prepares students to fit into different areas of the textile industries.

1.4. Specific Objectives

1. To examine the extent of relationship and functions of designs in the industry to those obtained in the academic institution.
2. To compare the skills involved in transfer techniques of designs in the two establishments and identify the extent of their relationships.
3. To examine the extent to which management training and practice in the academic institution relates to performances expected of them in the industry.

4. To examine the extent of differences that exist between the techniques of fabric decoration especially in printing and dyeing in the institution and what obtains in the industry.
5. To examine the use of tools and equipment in the academic institution and industry, and identify major differences in their functions.
6. To examine the relationships of weaving and other fabric construction techniques in the industry and academic institution.
7. To identify what employment goals or requirements of textile design graduates are in the industry, and examine the extent to which their training satisfies these needs.
8. To examine the extent of textile science and technology included in the programme as required by the industry.
9. To examine the effect of quality control area as this relates to what is in the institution.

1.5. Research Questions

From the underlying problems and purposes of this study, the following research questions were derived from the specific objectives to use as guides in the course of the study.

1. To what extent are the designs obtained

from the academic institutions related to those of the industry?

2. What is the extent of the relationship in the skills involved in transfer techniques of designs in the academic institution as compared with the industry.
3. To what extent is the management training and practice in the academic institution related to what they are expected of in the industry?
4. To what extent is the difference in technique of fabric decoration especially in printing and dyeing between the academic institution and the industry?
5. What are the major differences in the use and functions of tools and equipment in the academic institution and industry?
6. To what extent is weaving and other fabric construction techniques in the academic institution related to that of the industry?
7. What are the employment goals or requirements of a textile design graduate in the industry. And to what extent does their training satisfy these needs?
8. To what extent is textile science and technology included in the programme as required in the industry?

9. To what extent does the procedure to ensure quality control in production processes in institution compare with what happens in the industry?

1.6. Delimitations

This study is concerned with the extent of relationships between two major variables, the job skills of the textile industries and institutional textile design programme. Any nation according to Adetoro (1985), sees its education through industry and educational institutions. For an effective industrial design programme like in other parts of the world the industry should form an important source of reference to use in preparing a curriculum. The textile industry therefore is a job market available among other employment possibilities open to textile design graduates.

The industries which this study is concerned with are those clothing textile industries where fabric is carried, through the stages of spinning, weaving, design, printing and dyeing. The areas of coverage within the industries were restricted to real wax, designing, engraving, printing and dyeing, weaving, and sales departments. This is because these areas are those assumed to be related to the skills acquired by the graduates of textile design programme. The spread of such clothing

industry in the Northern States of Nigeria, which this study is concerned with is concentrated in Kaduna and Kano States.

The institutional textile design programme was confined to Ahmadu Bello University undergraduate programme within the period 1980 - 1985. The restriction on the institution was for the purpose of having a more specific study for detailed information from an institution. Another reason being that this institution has been the cradle institution where other Universities borrow leaf from. It was also seen to have graduated more students in this area. The period 1980 - 1985 was chosen to make it possible for the collection of accessible follow-up information on students who have graduated from the programme. These students are more assessible than others. It was assumed that the information might be inaccessible if the time was too far back.

1.7. Limitations

In the course of the study, certain problems were encountered which may have tampered with the result of the study. A fair representation of graduates for over the years was intended to be used as sample responding to the questionnaire. But only those living close to and around Zaria were used, in addition, some from distant places who visited the department around the time the questionnaires were

administered. Some of those from distant locations to whose addresses questionnaires were sent, did not respond.

Due to the academic background of some industry staff, some could not respond to the questionnaire because they claim not to have an idea of what is going on in the academic institution. Observation and discussion was used to collect information from this category of respondents.

The system of security maintained by the industry to visitors, researchers and students on industrial training were prohibiting people from entering certain sections of the mill. The real wax process was carried out in only one industry. Some information were also held back by respondents in the course of discussion by some members of the industry staff. Some of them assumed that disclosing certain information might affect their promotions. Part of the security measures maintained by the industries were the ban on taking photographs of the industry facilities, as such diagrams are used to depict certain equipment and processes.

The designs produced by the industry designers were not allowed out of the industry. As such designs used in administering the questionnaire in their place were designs done by students on industrial attachment under the industrial situation. It was assumed that this will not affect the

responses because the design conditions and principles of industry designs were followed by the students on industrial attachment.

A few of the respondents from the category of graduates of the programme, changed employment from the time a follow up study was conducted on them to the time questionnaire was administered. This made it difficult for the researcher to locate them to respond to the questionnaire.

1.8. Significance of the Study

Based on the problems and objectives that appear as the major concern of this study, it was believed that the study was to be of social, economical and educational values to students, teachers, curriculum planners, textile designers and industrialists in that it was an attempt to relate textile design programme to industrial job requirements, for the benefit of textile design graduates and students.

It was to highlight the areas of similarities between Ahmadu Bello University textile design programme and the industry, as well as to answer the question of why students of Ahmadu Bello University textile design programme do not easily obtain job in the industry.

It was to encourage the production of indigenous qualified working force for the textile industries.

It was to encourage the development of textile

design programme in A.B.U. to ensure more employment goal.

It is an addition to the existing literature on the development of effective textile teaching and programme.

And it was to encourage constant re-evaluation of textile design programme to reflect the changing needs of the society as well as preserving the past culture.

It was also to highlight for textile design graduates, areas of the industry they can fit into for employment.

1.9. Definition of Terms

Industry, as used in this study, refers to an organisation of trade or manufacture, involved in mechanised production of clothing fabric.

Academic institution refers to the school for higher educational study in which formal teaching and learning processes occur.

Industrial art has been alternately used with industrial design to mean a form of education which combines design and technology for the interpretation of culture.

The diagrams, pictures and samples used in the study were coded to facilitate easy reference. The codes used are defined as follows:

QSA: Questionnaire samples from the academic institution.

QSI: Questionnaire samples from the industry.

QS1A: Questionnaire samples from the industry and academic institution.

DEI: Designs from the industry.

DEA: Designs from the academic institution.

TTI: Transfer techniques from the industry.

TTA: Transfer techniques from the academic institution.

TEI: Tools and equipment from the industry.

TEA: Tools and equipment from the academic institution.

SWI: Spinning and weaving from the industry.

SWA: Spinning and weaving from the academic institution.

PDI: Printing and dyeing from the industry.

PDA: Printing and dyeing from the academic institution.

Abbreviations used in the study are:

UNTL: United Nigeria Textiles Limited.

EPI: Ends per inch.

PPI: Picks per inch.

ABU: Ahmadu Bello University, Zaria.

1.10. Research Design

The research design of a study forms the framework on which the whole study evolves upon. It states the procedure used, and tests for relation among variables. This study sought to find the extent of relationship between textile design programme in the educational institution and the skills expected of its graduates to acquire in

order to work effectively in the industry. It did so by examining what is existing in the industry in comparison with the textile design programme in A.B.U. between the period 1980 and 1985.

The population for the study was derived from textile industry in the Northern states of Nigeria where clothing fabric is carried from fibre to fabric decoration and finishing in one mill. Proportional sampling method was used to sample 100 respondents from the industry and institution on whom a five scaled response mode questionnaire was developed and administered. In addition to this, non participant observation and interview schedules were employed to confirm the information collected and reduce to some extent bias responses on the questionnaire. The results of the questionnaire were analysed by the use of tables and reported in percentages.

1.11. Assumption

It is assumed that information collected from the follow-up study on placement of graduates in textile design programme of Ahmadu Bello University are true as at the time they were collected. It was further assumed that information collected from the sampled industries would be a true reflection of the industry population.

1.12. Summary

Chapter I contains the introduction to the study. It relates manpower production role of the

university to the need for various disciplines of the industry. It states the background and motivating factors for the study. The chapter also contains statement of the problem, objectives of the study in general and specific terms as well as the significance of the study. It provides the scope and the framework on which the study evolves.

Chapter II will contain the review of related literature. Chapter III will discuss the procedure or method used in the collection of data. The study will present the analyses of the data as well as findings of the study in Chapter IV. Chapter V will present general discussions, conclusions, implications and recommendations.

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CHAPTER II

REVIEW OF RELATED LITERATURE

- 2.1. Introduction
- 2.2. The development of Industrial Design
- 2.3. The textile design programme and designer
- 2.4.1. Production skills and techniques in the Industry and Academic Institution
- 2.4.2. Designs
- 2.4.3. Reproduction Transfer Techniques
- 2.4.4. Printing, Dyeing, and Finishing
- 2.4.5. Spinning and Weaving
- 2.4.6. Quality control, Textile Science and Technology
- 2.5. Employment requirements of Textile design graduates in the industry.
- 2.6. Chapter Summary
- 2.7. Footnotes

2.1. INTRODUCTION

This review of related literature covers the development of industrial design, textile design programme and designer, production skills and techniques in the industry as well as employment requirements in the industry. The intention of reviewing the development of industrial design is to relate its evolution in academic institutional programme. The review of textile design programme and designer is to portray textile design as an aspect of industrial design and show the roles and qualities of a designer. The production skills

and techniques of the academic institution and industry provide evidence of their similarities and dissimilarities in the two establishment while the employment requirement of the industry provides basis for programme planning, evaluation and aspirations of students, in terms of career goals.

2.2. The Development of Industrial Design

Industrial education is a generic term which applies to all types of education related to the industry, including industrial Arts. It is also a planned instruction to develop basic manipulative skills, safety practices, judgement, technical knowledge and related occupational information. This enables the placement of individuals for initial employment in the industry. It could also be for upgrading and retraining of workers employed for the industry.

According to Strong and Schaefer (1975), educational enterprise came close to meeting the many objectives of industrial education through industrial arts - by viewing it as an area of education which prepares one for modern individual or cooperative group experiences in working for industrial needs. It also provides studies for the understanding of the consumer, occupational, historical and cultural aspects of industry and technology.

The learning experiences include activities

such as experimenting, designing, constructing, evaluating and using materials with processes which provide opportunities for creativity and problem solving. Also, the term is sometimes used to mean the preparation of teachers in the field of industrial art education. Monroe (1952), however feels that industrial art consists of effective means of developing creative thinking, and satisfying individual's creative urge. Planning, concentration and development for accuracy too are part of it. In general terms, character development, appreciation of materials, workmanship and design quality are basic to career education. He further reports that great educators, such as Rosseau, Pestalozzi and Frobel ascertain that basic theory of industrial art is learning by doing.

Andrew and Erricson (1976) believed that the contemporary industrial art which is now more academic in nature, developed from traditional manual training through apprenticeship. It was believed to be based on values which develop from manipulative activity and study of industrial material and processes. It also stresses exploration, participation, skills and efficiency. In another view, Pevsner (1964) opined that the idea of industrial art developed as a programme in 1919 when Walter amalgamated two schools at Weimer

Germany which he called Bauhaus. This encouraged designers to design for machine. Students were taught to handle tools, material and grasp the whole sequence of manufacturing. A similar situation to this set up, according to him, is what is expected from any industrial art institution.

Andrew and Erricson (1976) believe that skills were initially learnt through trial and error as well as through imitation. Later on, schools which were designed to train students for practical trades and occupation evolved. The two authors were of the opinion that industrial art as used in a school curriculum took its roots from apprenticeship system. It gradually developed from the form of manual training, through manual and vocational art education and finally industrial art or industrial design stages. On the same note, Strong and Schaefer (1975), opined that the earliest system of training for people to qualify for jobs was through apprenticeship system. It was classified into two systems (the voluntary and involuntary). The creation of early factories came along with new demands for labour which these systems could not adequately meet. This short-coming of apprenticeship system and increased demand for mechanisation of production, accelerated the urgent need for occupational education. Maley (1978), also opined that industrial education curriculum

normally provides students with what to expect in work world. This includes what kinds of jobs there are, how labour market and management relate. Barlow (1967) expressed a view that no system of education or manufacture is logical without having done anything to teach trainees how to do that which will most probably aid such trainees to make daily livelihood. One tends to agree that education generally and industry related education in particular is a system of preparing for life sustenance. The importance of industrial design, therefore is for it to contain guidance and counselling plans. Those involved in it too must understand their role in this important function.

2.3. The Textile Design Programme And Designer

Textile design has to do with the arrangement of forms, colours, and other elements, used for ornamentation on various textile materials. Here designs or patterns may be woven or knitted into the structure of fabric or they may form surface decoration. A blend of colours may brighten or improve the design or pattern. Bennette was quoted by Andrew and Erricson (1976) to have instituted six arts of the industry within which textile art is included. Textile Art is said to be based on activities of spinning, weaving, basketry and garment making. Fix (1982), in a review of programmes of textile design of higher

institutions in North America, listed printing, weaving, textile design, dyeing, colour studies and history of art as being common to most of the institutions.

In the programme of industrial design of A.B.U, 1981 students opting for textile designs are required to take drawing, design and production, design application, printed textile and decoration, textile management and organisation, resist methods and weaving. Doren (1954) believes that textile design deals with design problems in two dimensional forms while other aspects of industrial design involve three dimensional types. However, it is currently known that in academic institutions, textile works are seen to include two dimensional, three dimensional as well as sculptural forms. Dressel (1980) is of the view that the teaching and learning processes are vitally interrelated with objectives to be achieved, content selected and structure within which learning takes place. Furthermore, Doren (Op.cit) opined that by now it should be obvious that a study planned to achieve proficiency in an industrial design institution, is preferable as a preparation for a career. In a 1977 publication of Ahmadu Bello University, it was recommended that textile design education be based on the changing needs of the industry. Hann (1984) reported textile education in Britain as being based on the development in the industry.

In designing for textiles, the designer executes designs in relation to its use. Doren (1954) enumerated the capabilities of a designer as being creative, resourceful and having the ability to build enthusiasm in others. A designer should be practical without being timid and should know standard processes of manufacture. In addition a designer should be able to find ways of improving a product within the frame work of merchandising.

To further define the roles of a designer, Adetoro (1981) had tried to differentiate the roles of those with related duties. They are textile artist, designer and technologist. The textile artist, he opined, produces creative works as purely a decorative language on fabric for aesthetic hangings. The textile designer, in addition to these, sees through the process of production from beginning to the end. That is to say he creates designs, weaves, understands chemistry of colours, dyes and fabric reproduction as well as transfer techniques. The technologist uses science and machine for fabric production. He further believes that specific duties of a designer are not usually defined. Yet some schools of thought have narrowed these down to drawing, painting and surface decoration. Others feel that textile designers are

highly artistic, exploring creative ideas and composing them into colours. They are also believed to have knowledge of fabric raw materials and they liaison with technologists and scientists to know the science of fibre and fabric. They also know colour composition, chemicals and the working system of the loom. Adetoro (1981) in his differentiation of related textile specialists working roles, agrees with Strong and Schaefer (1975) as they identified the inter-relationship of the programmes of trade, industry and technical education in U.S.A. They however came up with clear differences in the roles and believe the distinction to have emerged in a historical sense from the advancement of technology. The impact of tradesman like the craftsman was seen to have reduced with the emergence of mass production of goods and services. Industrial employees became more useful in the society as specialists and technicians came in to the mechanical operation area, working with the industrialists.

2.4.1. Production Skills And Techniques In The Industry And Academic Institution

Man used textile art in the reproduction of fabrics to conceal himself. The processes of production followed varying trends from traditional manual types to present day sophisticated and mechanical types. In between these came the contemporary styles which were mostly employed by

hand crafted industries and academic institutions for production. In ancient times according to Riggs (1976), production was by manual labour instead of through the use of machine. The change into mechanical system was a result of the introduction of steam power in the 1700s, as well as later developments. Ormerod (1979) defines production as the mass generation of commercial products in sprawling factories. Shirley (1973) classified the production of textile fabrics in the industries into four main directions such as clothing, household, industrial and carpet fabrics. Amongst these, the clothing fabric industries had the largest outlet of production. This he associated with the growing need and power of fashion.

The production of clothing fabric started with the ancient man and improved with time into mechanised industries. Moore (1962) identified three basic elements of production. These are, material, men and machine. Their movements facilitate conversion of raw material to fabric finishing in an industrial setup. Men require skillful knowledge and good working conditions to make this movement work in the industry. The basic features of human performances are the same in doing any activity. Seymour (1968) contended however, that skill at work is derived from

specialised developments of general abilities in human performances like in other activities.

2.4.2. Design

Design application is an art form meant to increase the visual attractiveness of cloth. To Held (1972), design is an organisation of productive, economic and humorous balance of elements necessary for a particular production. In a study, Maurice (1974) describes it as an arrangement of art work, according to likeness, transformed into shapes solid or dramatic. Stout (1970) describes design in more relative term to textile, as pattern or figure repeated at regular intervals. He understood these to refer to patterned fabric. Design generally enriches the designer as well as the user of such design. Buoye (1984), opined that a good design, as far as the industry is concerned is that which sells more in the market and described as such by the consumers. The result of the instrument he used to conduct an opinion study of buyers of fabrics produced in the industry, shows that colour seems to be the strongest aspect of good design. quality considered by consumers. Other factors such as aesthetic appeal, comfort and durability were identified as motivating to consumers decision for choice of good fabric. Albeck (1969), supports the idea that colour plays an important

role in design. In his analysis of elements of good design, he maintains that high quality design depends largely on the relationships between types of fabric and colours used. As colour often gives meaning to design, so also does design give meaning to colour.

A designer normally explores different areas of designing. He views design in relation to its end use and methods of accomplishment. Bako (1986) reports that there are various techniques of accomplishing design available to the industrial designer. He observes that designs intended for Real Wax, African Print, Java, and the rest are given different styles of treatment to reflect individual style or technique of end product. Whereas in the academic institution are confined to producing reproduceable printed designs on flat screen mainly. Buoye (1984) remarked that it was possible for an industry designer to treat and reproduce a single motif in varying styles resulting in to Real Wax, imitation wax, tetron and cotton as well as imitation george fabrics while less varieties are often available in academic institution because of shortage in facilities. What ever the differences in designing, the application to fabric as contended by Panokowski and Panokowski (1972) is either structurally or applied. In the structural approach the design is incorporated into the

construction of the fabric and in applied it is added on the fabric after construction. This makes it possible for a designer to produce designs for weavers of fabric as well as printers or dyers of fabric.

2.4.3. Transfer Techniques For Reproduction Process

For designs to be reproduceable the varying procedures employed will depend on the design created in relation to the nature and function of the fabric. In the industry, Adukpe (1986) observed that in order to transfer a design unto a roller, screen or wood block, colour separation is required. This means that except for overprints, each colour must be printed separately. Small unit areas of the design are produced, photocopied and laid to form the repeats of the design. Here the bulk of this processes is eased by the use of mechanical aid. In the academic institution, reproduction process is manually controlled at every stage.

Kaufman (1981) observes that the Asian and African fabric art of the medieval period were not mass reproduced. This he associates with their methods of production. He further related that in the 11th century, wood block printing was developed in Germany and it provided for the reproduction of designs on woven brocade and damask. This increased the production capacity. Hall (1975) contends that

transferring design on fabric in early time was by the use of charcoal dust forced through perforated paper. This technique was improved by using brush to print blue or red dye manually on fabrics. However, the present day technology tends to ease these manual slow and long processes, by the introduction of machine and photographic methods in place of hand method. This according to Hall (1975) has been able to reduce cost of reproduction in any way.

2.4.4. Printing And Dyeing

This is another area of variance in production skills and techniques between industry and academic institution. It is an important aspect in fabric decoration process. Stout (1970) opined that finishing of fabric includes all the processes that fabric goes through after weaving, knitting or felting, in preparation for use by garment manufacturers. Finishing in the industry consists of scouring, bleaching, dyeing, printing and after treatment applied to increase lustre, or other specific function.

Hall (1975) describes printing as the application of dye to cloth surface in specially localised area. He contends that these could be done by different processes. The design is created by the colour and motif. Dyeing, according to

Hoechst undated publication, is to impregnate fabric with dye substance in an aqueous state. The publication states that unlike printing, there is a more uniform penetration of dye into the fibre of the cloth.

Miles (1971) recalled that fabric decoration started with painting pigment and adhesive mixture on the surface of cloth since about 2,000 B.C. Later some other techniques such as resist dyeing, block printing flat screen printing, engraved copper plates, printing copper roller and screen roller printing followed. Other recently developed methods according to Ormerod (1979) include heat transfer and polychromatic dyeing. Miles (1971) reported that the wood block method of printing was an adaptation of the Indonesian batik Tjap printing. This method though old is still being used in Nigerian textile industries as observed in a research conducted by Buoye (1984). Kaufman (1981) opined that it was the development of roller printing in 1900 that increased the output of fabric industries.

In the contemporary world today, the need for patterned surfaces seem to be on the increase. However, the principles and philosophy behind dye or pigment application to fabric remains the same. The techniques, speed and ease in the production processes have been improved on, greatly by

contemporary technology. Recent methods according to Kaufman (1981) made room for correct registration in the movement of screen and in a refined manner. More advanced printing by screen were also found in the use of rotary screen which are cylindrical.

2.4.5. Spinning And Weaving

In the very beginning, most sources had traced the start of weaving to stone age when man wove for shelter and clothing. Crawford, in Thrope and Larsen (1967) observed that weaving started prior to this period. The Paleolithic man was said to have used pliable material for binding implements. The pliable materials were got from raw hide stripe and plant fibre. Crawford further opined that weaving which involves the interlacing of yarns might have developed from the manipulation of this pliable material. Cochrane (1974) believes weaving to have started with the Egyptian civilisation at about 5,000 B.C.

The introduction of spinning and weaving into modern industry resulted gradually as a result of the short comings of the traditional manual processes. The slow nature of fabric production and high demand called for alternative fast device. Cochrane (op.cit) recalls that the act of spinning was improved by the introduction of some early mechanised form of machine for spinning. This

produced even more yarns than could be woven. The situation also called for improvement in the weaving area. Welford (1950) reported that development in weaving started with the introduction of flying shuttle which fastens the weaving process. This was followed by the invention of power looms in 1785 by Edmund Cartwright. Its technology was later modified and improved upon to the present types found in textile industries.

Other variations of weaving looms were developed and used for the production of different types of weaves. Omerod (1979) had identified up to 70 types of loom structures with 11 types of weft insertion techniques. These are accounted for by improved technology. In Nigeria today, Dezhi in an undated paper, grouped the types of looms into those for producing narrow fabrics like ribbons, dobby materials, jacquard, (towels), Thrope and Larsen (1967) uphold their views that what ever the beginning or technology involved in weaving and loom structure the basic weaving principles remain the same on traditional, contemporary or power looms. He maintained that they all engage in the interlacing of length wise and crosswise yarn. Recent studies in weaving have been able to prove this. Ada (1985) used a contemporary non motorised loom to produce functional woven pieces for the Nigerian Army belts and napkins in place of the

imported types woven on powered loom. This is a reassurance of the fact that the type of technique required does not dictate what loom is used. In other words weavers can select any stage of the technological process to produce their required cloth.

2.4.6. Quality Control, Textile Science And Technology

These are necessary requirements for the designer as they go a long way to provide the design out-come with standard quality and reliability. In Nigeria today, like any other place in the world, quality of a product is a significant factor in guiding consumer's purchase decision. As a result, people involved in production are getting more concerned about the control of this quality. Eze (1983) states that the control of quality in the industry involves the performance of the right kind of job, reproduction, establishment of a meaningful relationship between the vendor and consumer which correspondingly improves business result. Damachi and Diejomah (1978) defines it as attributes of a process or product with established standards. This definition is not precise but they felt that such attributes differ from one individual to another. Simply put, quality applies to the relationship of product efficiency to its operation or service. Riggs (1976) in a more descriptive manner, defines

quality control as those set of functions and activities whose purposes are to assure the achievement of established standard of quality. He further attributed them to qualitative and quantitative factors. These are influenced by good working conditions, well trained workers, well designed work areas and contribution of good workmanship and efficiency. Industrial engineers, training specialists, psychologists and others have been working to provide alternative operational efficiency and quality.

Quality control is applied to all stages of production to meet established standards of quality in the most economic manner. In the academic institutions, control of quality and reliability in products are not easily maintained. This is probably due to the lack of standard equipment necessary for adequate measurement and testing for reliability in reproduction. Gwari (1986) observed that dyes are measured and tested scientifically for fastness quality and in relation to use on particular fabric in the industry. He comments that the inadequate science and technology makes it difficult for institutions to acquire this validity and reliability in their products. Science and technology are necessary for reproduction of goods. Abdullahi (1984) called for a reorientation of

educational policies to encourage technological skill acquisition. He maintains that this will foster the indigenous manpower supply which will be functionally relevant to the needs of the industry.

2.5. Employment Requirement of Textile Design Graduate In The Industry

Unemployment was not much of a problem in traditional African society. All persons had some assigned duties in tribal cultures, such as sitting in council of elders, tending crops, herding animals, blacksmithing, weaving, dyeing and many others. The problems manifested then were not in skill or the lack of occupation. Fapohunda (1970), traced the wages-earning employment in Nigeria to have come along with the white man's colonization of Africa. Before then the average Nigerian considered working for someone and earning payment as a form of slavery and looked down upon it as degrading. Fapohunda (1970) further observed that initially, people did not even want to work for the government, but the policy of payment fostered wage-earning employment and today unemployment exists in Nigeria.

Unemployment to Yesufu (1969) could also mean idleness of man who depends on employment for a livelihood and cannot secure the type that suits him when he wants it. He further portrayed the unemployed as one who must be able to work, and depends on employment for livelihood but unable to

secure one. The labour problem of developing countries generally, is shortage of skilled labour and excess of unskilled labour. Nigeria today, is deviating slightly from this situation. Abu (1973) reports that textile industries like other similar types in Nigeria, are faced with problems of high cost in production and low quality products. He opined that among other causes, the problems could be attributed to external factors beyond the industries direct control. However, good management and suitable technical know-how is required to solve some of the quality control problems. Abu (1973) further observes that experienced qualified textile graduates and management graduates roam the streets while industries produce low quality products. Raji, in an undated publication observed that Nigerian industries depend so much on their foreign partners for jobs which could be handled by qualified indigenous work force, Ugbolue (1982) confirms this in a survey study in which he found that among 812 technologists in some Nigerian textile mills, only 300 were Nigerians. Some of the causes of such situation, as explained by Assistant General Manager UNTL, concerns the nature of most textile industries in Nigeria which are multinational companies. In that case the foreign partners own a major share and tend to control the industry. He contends that it is only by the indigenisation policy currently enforced by Nigerian government that some graduates

are being employed in the industry.

Human resources deal with man in relation to work world. They are the energies, skill, talents and knowledge of people which can be applied to production of goods or rendering of good services. The need for these human resources had arisen interest among academicians and policy makers in the past. Adewuyi (1975) believes that academic institutions are gradually tackling the problem by creating new instructional programmes in manpower development. He further maintains that investment on education certainly contributes to economic growth of a nation. It is possible to develop human skills, knowledge and capacity in many ways but the most obvious are through formal education and on the job training with formal or systematic training within work environment.

From collected information, it is established that a graduate in the industry is employed as a supervisor. To Riggs, (1976), this is an important position in the production system. Supervisors, according to Ormerod (1979) are specialists who handle related technical areas of production and form part of the activities. Adetoro (1980) opined that the textile design graduate is expected to have a grasp of the whole process of production. This will allow him play some supervisory roles as defined by Ormerod (1979) to include management of

people, directing peoples work and connecting management with production sectors, for effective performance. Riggs (1976) also enumerated certain employment requirements for a textile worker. In his opinion, these requirements consist of some physical traits, job experience, schools records and recommendations. Others are professional or special skills, attitude and ajustment abilities. These, he believes, are certain things that are checked before employing a textile worker.

2.6. Chapter Summary

This chapter reviews the development of industrial design into school curriculum, textile designs as an aspect of industrial design and industry based programme as well as the designer and his roles. It also examines the state of knowledge in respect of production processes, skills and techniques generally used by designers of academic institution and textile industry. It further looked into the studies on job requirements for graduates in the industry. The procedure for collection and treatment of data as well as the nucleus of this study are presented in Chapter III.

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CHAPTER III

PROCEDURE FOR COLLECTION AND TREATING OF DATA

- 3.1. Introduction
- 3.2. The population and sampling of the study
- 3.3. The survey instrument
- 3.4. Procedure for collection of data
- 3.5. Survey on working and related areas of the industry and academic institution
 - 3.5.1. Designs
 - 3.5.2. Transfer techniques for reproduction
 - 3.5.3. Tools and equipment used
 - 3.5.4. Printing and dyeing
 - 3.5.5. Spinning and Weaving
 - 3.5.6. Science, technology and quality control
- 3.6. Chapter Summary
- 3.7. Foot Notes
- 3.1. INTRODUCTION

Kerlinger (1973) contends that a research design is the plan structure and strategy of investigation conceived to obtain answers to obtain answers to research questions and the control of variables. It sets up the frame work of adequate testing for the relations among variables. The design in this study enables one to see the correlation between textile design programme in

educational institution and the skills expected of its graduates in the industry. In this chapter the procedure and methods employed in the collection of data for the study are described. The population and sampling techniques used for the study are also discussed.

3.2. The Population and Sampling of the Study

The population of the study comprises all clothing textile industries in the Northern states of Nigeria, where fabric production is done from the stage of fibre through the stages of weaving, dyeing, printing and finishing in one mill. Most of the textile industries in Northern Nigeria were found to be concentrated in Kano and Kaduna States. There are a few others scattered all over the rest of the Northern states but a study of the situation in Kaduna and Kano was thought to be adequate to draw reference to the rest. Some of the problems faced by other industries could be inadequate facilities or poor staffing. As such some industries depend on others for their own raw material, or confine themselves to a specific technique of production or only concentrate on certain stages of the production process. Other reasons could have been the nature of the fabric the industry intends to embark upon.

About five industries in the two states were found to fall within the categories of industries

included in this study. One industry was sample from each state. The two are United Nigeria Textile Limited, Kaduna, and Kano Textile Limited, Kano. The Ahmadu Bello University textile design programme between 1980 - 1985 too, fall within the scope of the study. This includes the teaching staff, students and graduates of the programme during this period.

For the purpose of this study, a sample of 100 respondents was drawn from the population. This sample was drawn from an estimated population of 10,000. According to Fiannu (1985) when the population of a study consists of different strata with different population size, proportional sampling method could be used for better representation of the population in the sample. In this study the population from the industry was seen to have more variability and size followed by students/graduates and then the teaching staff. Below is the distribution of the samples selected:

Ahmadu Bello University Textile Design Teaching Staff	10
Textile Design Students/Graduates Between 1980 - 1985	30
Textile Industry Staff	60
TOTAL	<u>100</u>

3.3. Survey Instrument

The main instrument used for this study is a questionnaire administered along with samples of

designs, printed fabric woven pieces and colour separation films from the two establishments. The samples were used to aid the respondents and guide on statements in the questionnaire. The 22 item questionnaire (Appendix A) titled "A Comparative Study of Ahmadu Bello University Textile Design Programme and Job Expectations of its Graduates in the Textile Industry", sought to find out the extent of respondents agreement to statements. It was administered on 100 respondents. Likert scale method of data gathering and processing was used. This technique assigns grade value to responses of respondents as follows:

- | | |
|----------------------------|---|
| A. Strongly agree | 5 |
| B. Agree | 4 |
| C. Uncertain | 3 |
| D. Disagree | 2 |
| E. Strongly disagree | 1 |

Burrough (1975) believes that when Likert scale is used, it is possible to report responses in percentages. This could be done by combining the two outside categories on the 5 point scale. In this study too, opinions of respondents were analysed by indicating percentage response for individual statements to find the proportion of the responses between 3 categories of respondents. Furthermore, questionnaire, according to Bruce (1978) makes it possible for opinion of respondents to be measured in terms of his likes and dislikes,

what he thinks and what he knows. All these amount to the result of his personal feelings on a specific statement.

Industrial Sociologists believe that an appropriate information on industrial research works are better collected through observation. They opined that this would help reduce the extent of bias which might occur in responding to interviews and questionnaire. For this study, a non participant observation was employed in addition to general discussions and questionnaire. The use of official documents, statistical records and related literature were also embarked on. A followup study of graduate students earlier used yielded the result of the pilot study (Appendix B).

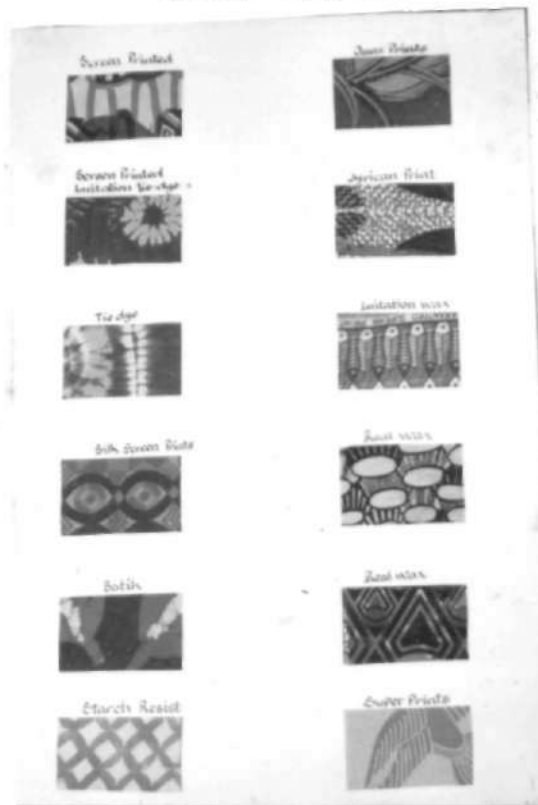
3.4. Procedure for Collection of Data

In the early stage of the study, based on the background and motivations for the study, the concern of the research was the assumption that textile design graduates are not adequately represented in the industry. A follow up study of graduates between 1980 and 1985 confirmed this. The job placement table (Appendix B) is the representation of graduates in various jobs. Official records of the department of industrial design were used to conduct follow up study on graduate students. Further information was sought from graduates found in and around Zaria. A further

aspect of the procedure was to conduct an interview on, and observe some participants. Information about graduates living far away was got from some other graduates. In the course of the interrogation, respondents were asked on other problems they encounter on the skill they acquired from their training in relation to their present jobs.

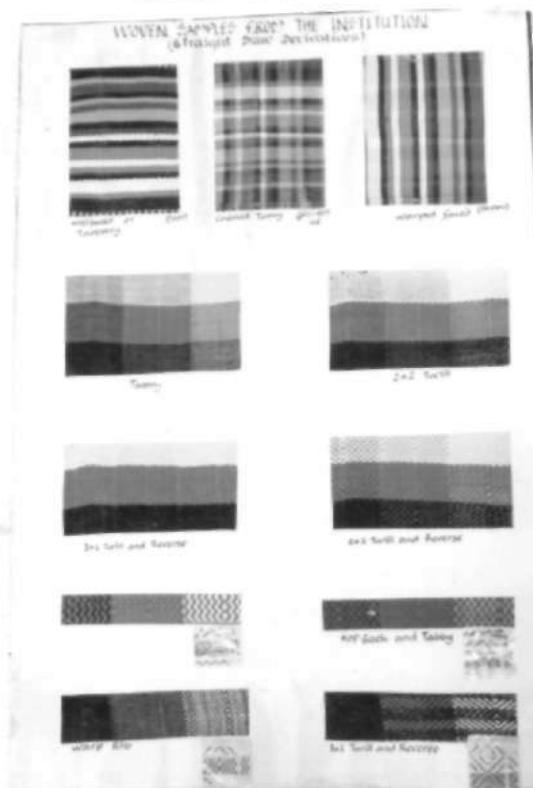
A questionnaire was designed and used for the respondents from the 3 categories as ABU teaching staff of textile design programme, Industry staff and textile design graduates or students between 1980 and 1985. In anticipation for respondents who might not be familiar with the production skills of the two institutions, samples of products from the two establishments such as paper designs, printed and dyed fabrics, colour separation films as well as tracing papers were displayed along with the questionnaire to guide them in making value judgement for the related responses. The pictures that follow show the samples used in order to administer the questionnaire.

QSIA: 047/056



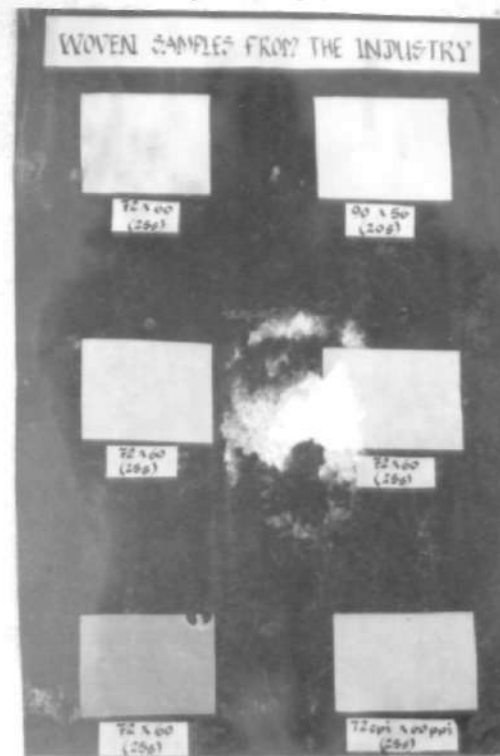
Printed And Dyed Fabric From The Industry And Academic Institution

QSIA: 048



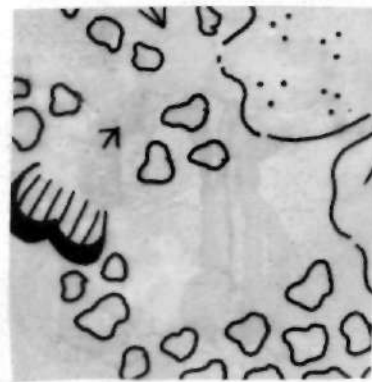
Weaving Samples From The Academic Institution

QSI: 057



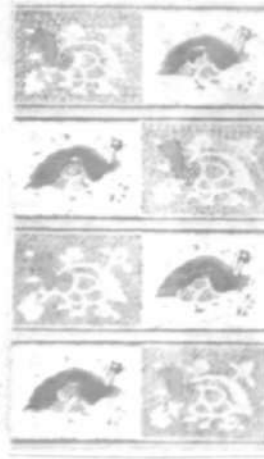
Weaving Samples From The Industry

QSIA: 049/058



Colour Separation Films Used By The Industry And Academic
Institution

QSIA: 049/058



Comparing Paper Designs From Industry And Academic
Institution

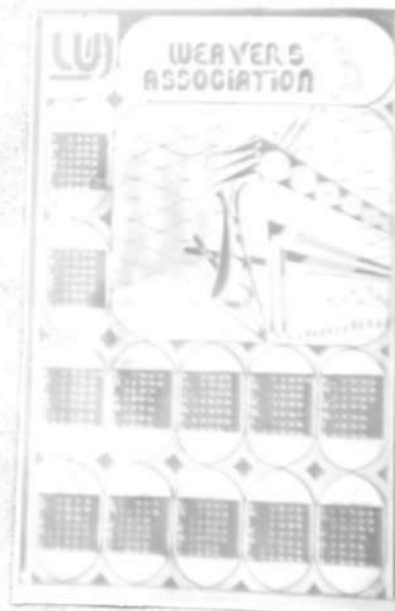
QSIA: 051/060



Comparing Paper Designs From Industry And Academic
Institution



Comparing Paper Designs From Industry And Academic
Institution



Comparing Paper Designs From Industry And Academic
Institution

3.5. Survey on the Working And Related Areas of the Industry And Academic Institution

At the beginning of this study, questionnaire, non participant observation as well as discussions have been planned as procedure for data collection. In this second part of the study, data collected from observation and discussions are grouped into the following areas:

1. Designs
2. Transfer techniques for reproduction
3. Tools and equipment used
4. Printing and dyeing
5. Weaving
6. Science, technology and quality control

The observations from the two establishment are presented as above. These are compared for similarities and differences in the next chapter, in order to establish their relationships. Any observation made may be a contributive factor for the reason why many graduates of A.B.U. Textile design programme are not working in the industry.

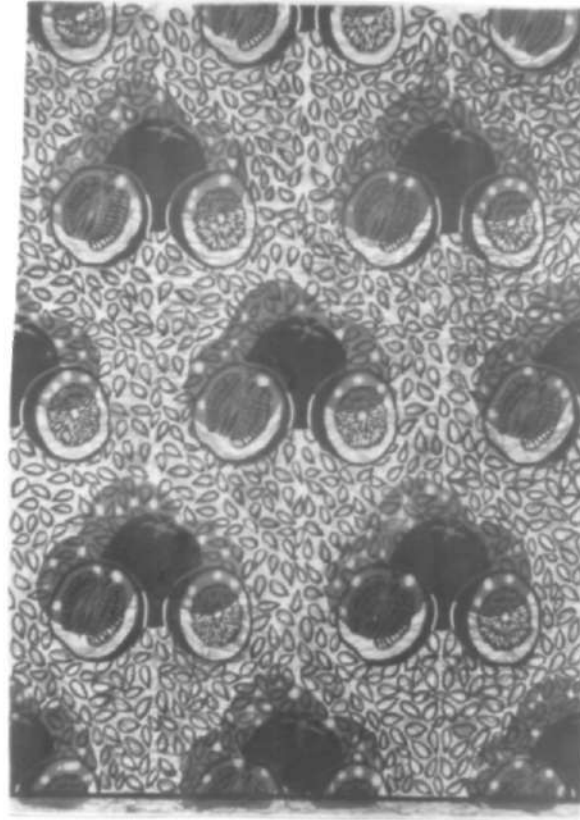
3.5.1. Designs

Designing in the industry was observed in process and it was found that inspirations for designs are drawn from nature. The Designers often realistically represent objects.

In the academic institution however, designs are

created by the balanced use of elements and principles of design. Motifs in design were based on geometric shapes and abstract forms. This was said to be embarked upon in an attempt to be original. The following pictures show these differences:

DEI: 001



Realistic Representation In Design from The Industry.

DEI: 002



Floral Design From The Industry

DEA: 001



Abstraction In Design From The Academic Institution

DEA: 002



Geometric Design From The Academic Institution

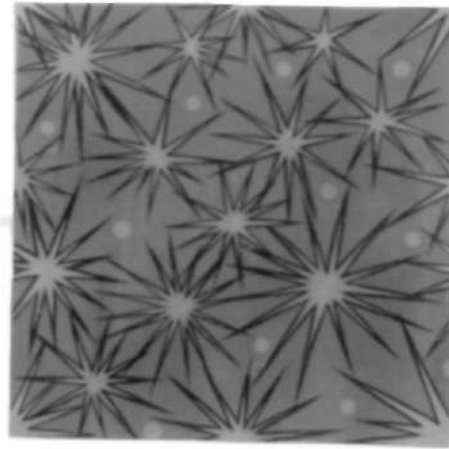
Other characteristic features found in the designs of the industry are variation in design treatment which produces designs peculiar to the production of fabric such as Java Prints, Real Wax, Imitation Wax, Imitation George as well as tetron and Cotton Print Designs. There is a limited use of colour in a single design. This is meant to reduce cost of production. The pictures that follow illustrate the different fabric types and various design techniques as well as different treatments as they are used in the industry:

DEI: 003



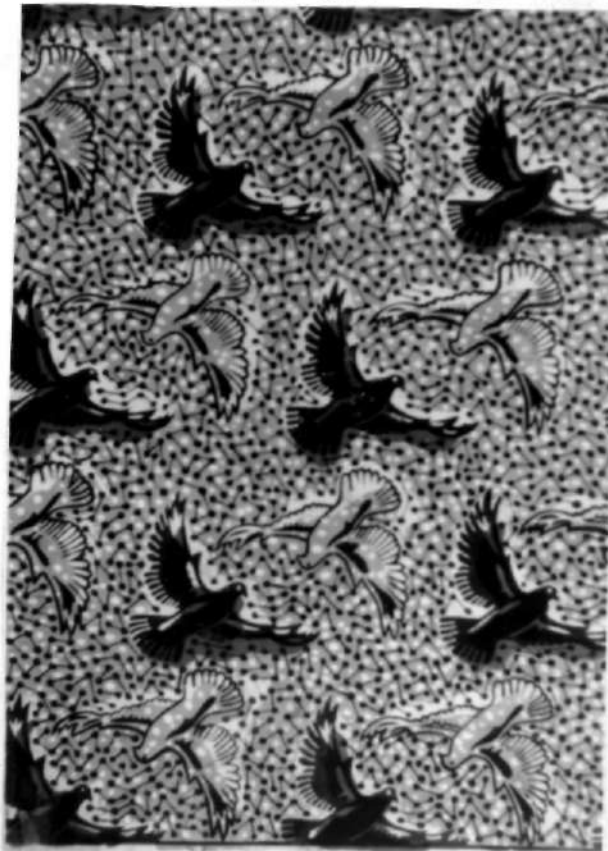
Java Design

DEI: 005



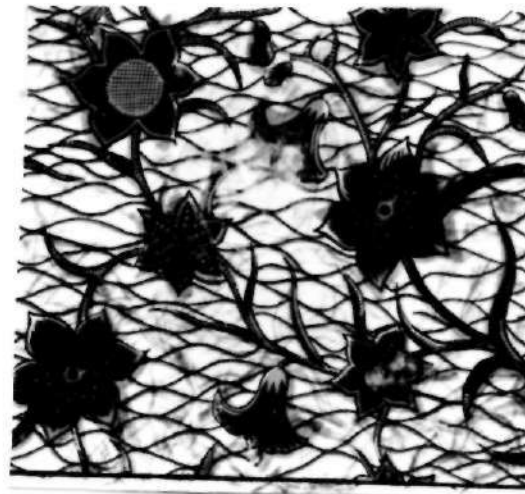
Tetron/Cotton Design From The Industry

DEI: 006

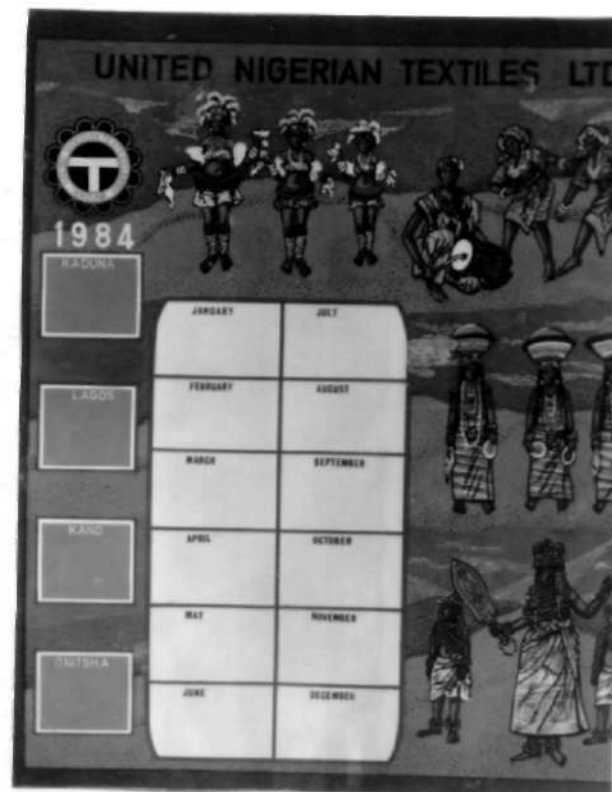


Real Wax Design From The Industry

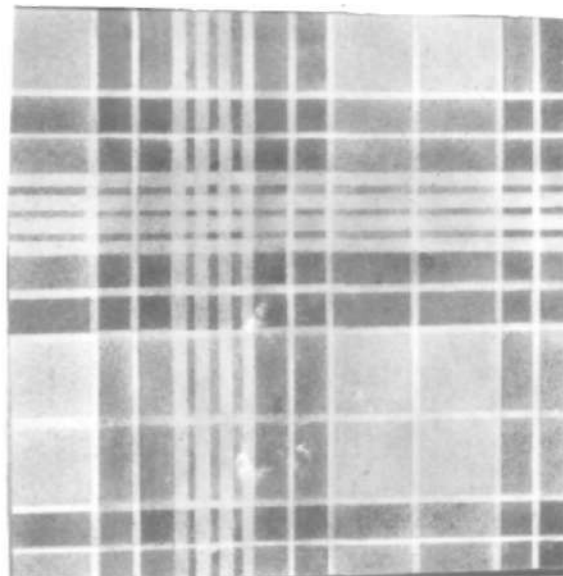
DEI: 007



Super Wax Design From The Industry



Calendar Design From The Industry



Imitation George Design From The Industry

On the other hand the variations in designs from academic institution, produces fabric design on paper in the direction of dress and furnishing designs including printed cloth calendar. Others are imitation tie dye designs, weaving, lace and printed tie dye. The following pictures are samples of such designs from the academic institution.

DEA: 003

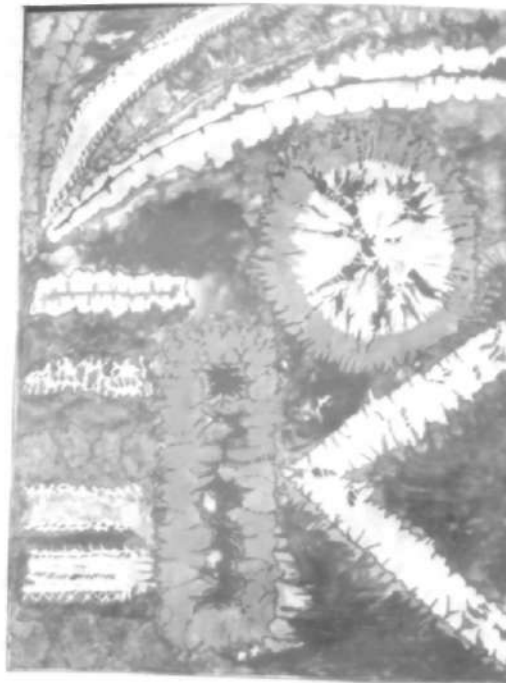


Furnishing Design And Colour Sketch (Academic Institution)



Dress Design And Colour Sketch (Academic Institution)

DEA: 005



Tiedye Design (Academic Institution)

DEA: 006



Lace Design (Academic Institution)

DEA: 007



Calendar Design (Academic Institution)

DEA: 008



Weaving Design (Academic Institution)

DEA: 009



Starch Resist Design (Academic Institution)

DEA: 010



Imitation Tiedye Design (Academic Institution)



Batik Design (Academic Institution)

3.5.2. Transfer Techniques For Reproduction Process

This involves some manual and mechanical processes in the industry while it is almost completely manual in the academic institution. The processes involved are colour separation, arranging the design for repeat and preparation of screen or roller. In the industry, colour separation is done by tracing out different colour areas of the design on separate films and painting it with opaque ink. The copy camera reproduces copies for proper laying of the identical motif or unit to form a unit of design to the size of the roller.

The design is transferred onto the roller by machine transfer or through a photochemical process in the industry. It is later exposed to a sensitised roller, developed and put into another chemical for etching or the design is incised on the pantograph transferring machine. The roller is chemically etched and corrected with etching tools later. The engraved roller after etching is left with transferred design in a relief form. It is checked for any mistakes by applying white chalk to the surface of the roller to expose any areas of mistake.

In the academic institution, transfer techniques also follow the form of tracing out areas of same colour, laying repeat and preparing screen. The traced design is shaded in dark and light as positive and negative areas. This is to differentiate between the areas that need to be cut on the profilm. The profilm is cut to size and mounted firmly on the traced design. Without shifting the profilm, the designer carefully cuts out the positive areas of the design which appear as printed on the cloth. The cut out stencil of profilm is transferred on to the screen through heat transfer technique. Some types of profilm are transferred by rubbing a chemical in the surface of the film before adhering it unto the screen. The paper liner of the profilm is later peeled off, thereby exposing the perforated areas through which colour or dye passes to print on the fabric. The illustrations below show the cutting and technique of adhering profilm onto the mesh.

TTA: 011



Cutting Profilm

TTA: 012



Ironing Profilm

This process is also proof checked in the institution by holding the screen to the direction of light. Areas intended to be covered but perforated are identified. These areas are masked with adhering paper or coated with some shellac, lacquer and the like. Other alternative methods of blocking the screen is by coating it, with shllace, wax or similar adhesive solution applied with brush. Below are some examples of coated meshes.

TTA: 013



Shellac Coated Mesh

TTA: 014



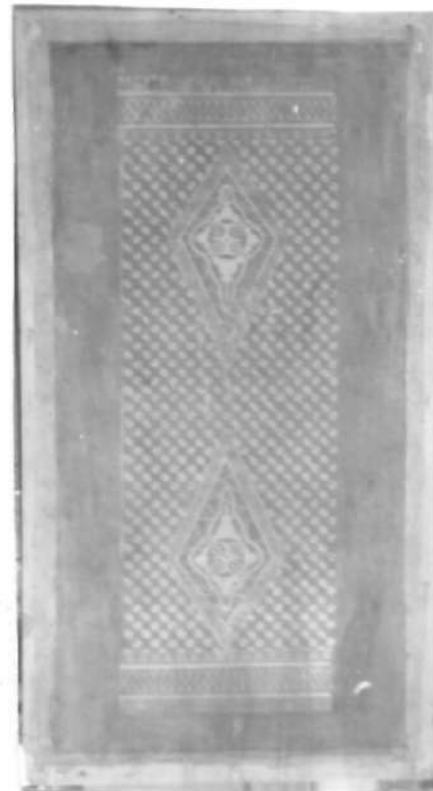
Paper Coated Mesh

TTA: 016



Profilm Coated Mesh

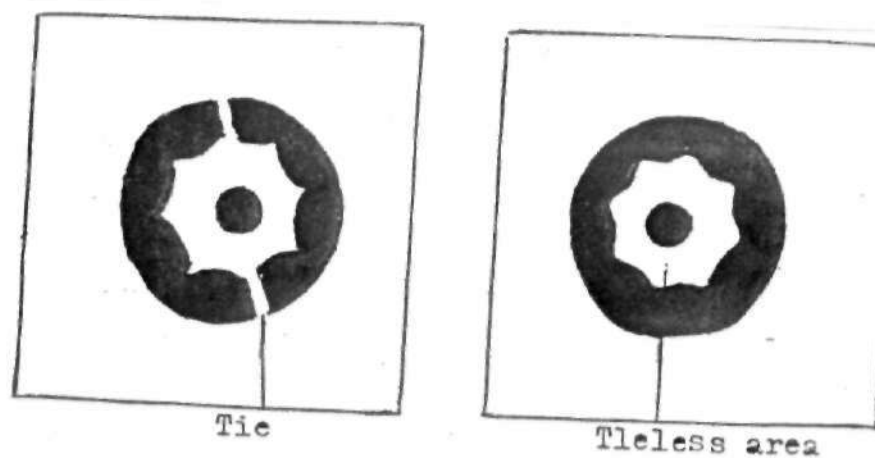
TTA: 017



Photochemically Coated Mesh

News-print could also be cut out as stencil which is transferred onto the mesh during the process of printing. The printing ink adheres it to the screen. In screen printing, the use of profilm, has more advantage over the paper stencil type and screen coating type. This is because it is possible to use the profilm for printing fabric of several meters length without getting spoilt whereas the paper stencil easily get soaked and damaged. After printing, if the design is not required again, the screen could be retrieved when profilm or paper is used but not when some coating agents are used on the screen. Another advantage the profilm has over the paper stencil is the possibility of **being** used to print tieless design areas. The diagram below shows prints from the two types of print.

TTA: 018

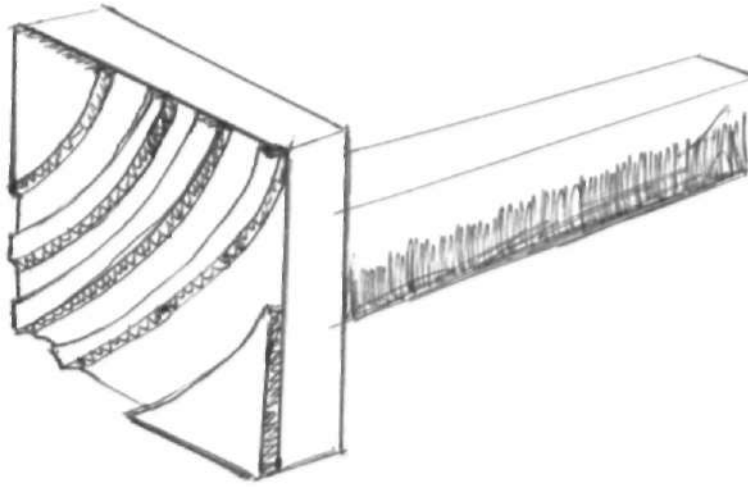


Prints From Paper Stencil And Profilm

The problems that may be created by the tieless areas can easily be solved when a screen is coated. A screen coating method in the academic institution similar to the industry style of producing rollers by photochemical methods, is the photographic design transfer method. The design here is also painted on transparent film with opaque ink. The screen is sensitised with some photochemical in darkroom. The transferred design is laid over it, and a glass sheet used to press it and then exposed to strong light for a short while to develop. The screen is washed under a running tap to remove the sensitised solution not exposed to light. It is also possible to print tieless areas in the design by this process. The screen could be cleaned for use again.

Other design transfer methods in the institution is by direct drawing of the design onto fabric. This was observed in the tie dye and batik processes. In another case, a piece of lino or wood is cut into relief form to use as motif for printing by stamping. Below is the illustration of such block.

TTA: 020



Lino or Wood Block

In the starch resist process the design is transferred onto the stencil sheet directly. It is cut out as in the case of newsprint stencil. The stencil is then used to print paste on fabric and not ink. The printed areas are resisted when the cloth is later dyed.

3.5.3. Tools And Equipment

The major differences existing between the industry and institution are based on the tools and equipment used, which are peculiar with handcrafted and mechanised systems. In the academic institution, alternative processes to mechanised methods are used to achieve fabric production. Acquisition of knowledge in the industrial processes are reserved for theory lessons and industrial training. The mechanised tools and equipment were engaged in different functions. There are the carding machine, roving and spinning machines and the like. Some machines were also engaged in warping, sizing and weaving. In printing and dyeing many other tools and equipment like rollers, printing machine and baths for scouring, bleaching, drying, steaming and ironing were found.

In the academic institution, all of the tools and equipment are manually operated. This could also be because the institution is mainly involved

in handcrafted method of production. In designing, the tools and equipment are the same in industry as in the academic institution with slight differences. In area of design transfer, differences begin to appear in the tools and equipment used. However the principles behind their use are similar whether in the institution or industry. Flat screens are used on printing tables in place of roller and printing machines. Various power driven looms were found in the industry while non-motorised floor and table looms are used in the academic institution. Frame looms and inkle looms were also found in the academic institution.

Tools and equipments found in the design areas of the academic institution and industry are observed to be similar. Some of such materials are tracing paper, poster paint, drawing set, brushes etc. The pictures below present some of these items.

TTIA: 054/063



Tracing Paper Rolls

TTIA: 055/063

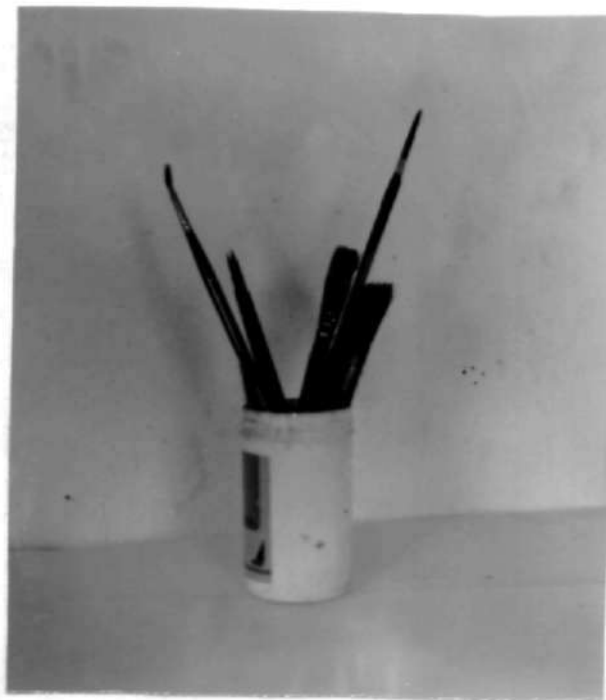


Drawing Set

TTIA: 050/065

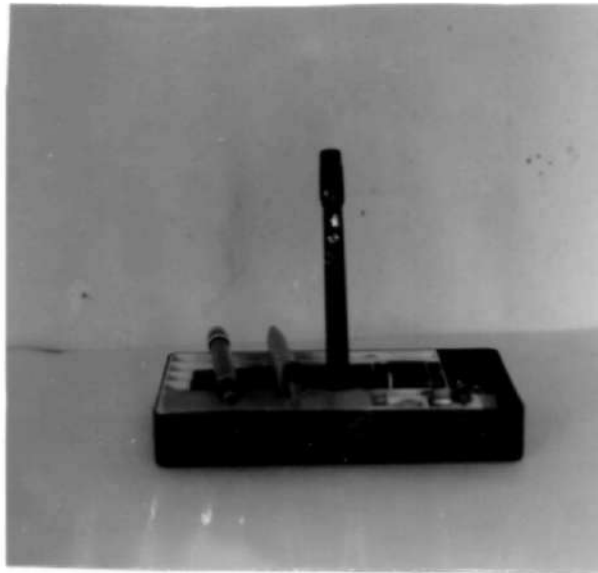


Poster Paints And Ecoline



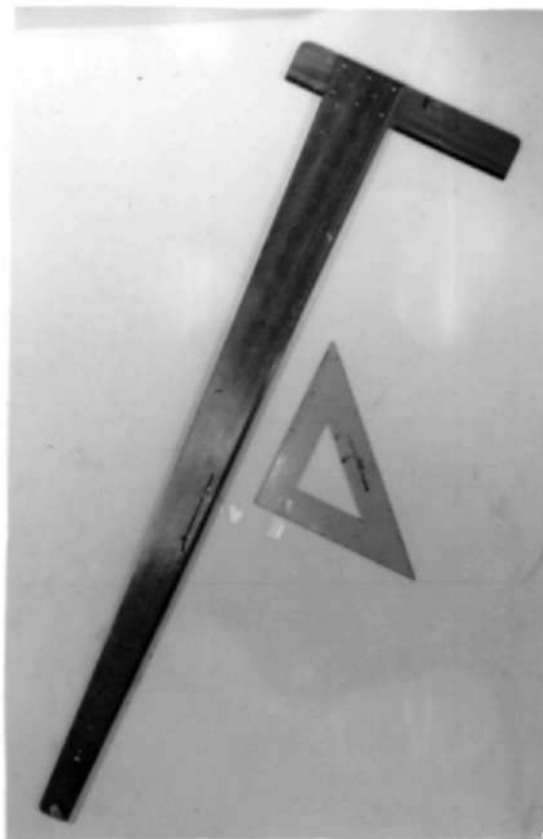
Brushes

TTIA: 058/067



Pens

TTIA: 074/076

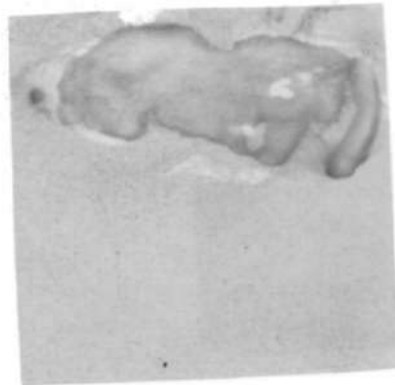


Set Square And 'T' Square

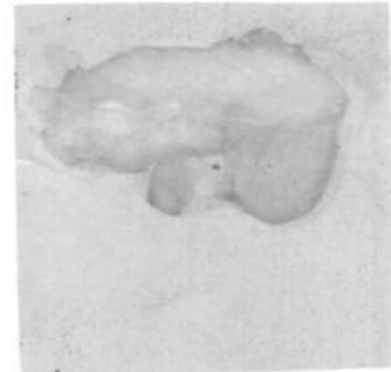
Transfer Techniques Tools And Equipment

The industry uses different types of acetate or polyester films for tracing, photocopying and development for transfer on to roller. Some examples of the polyester or acetate films are light sensitive polyester films that are either one-sided or two-sided for photographic transfer of design. Plain polyester and art films are used for mounting designed and copied motifs and laying them for repeat. The samples provided illustrate these films used in the industry. For the transfer process, the following tools are used for the various types of rollers as well as engraving processes.

TEI: 013

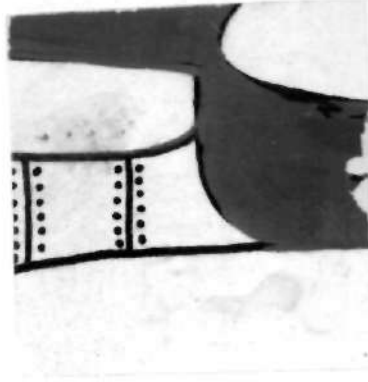


One-sided Polyester
film. (Light Sensitive)



Two-sided Light
Sensitive Polyester
Film.

TEI: 014



Painted Polyester Film

TEI: 015b



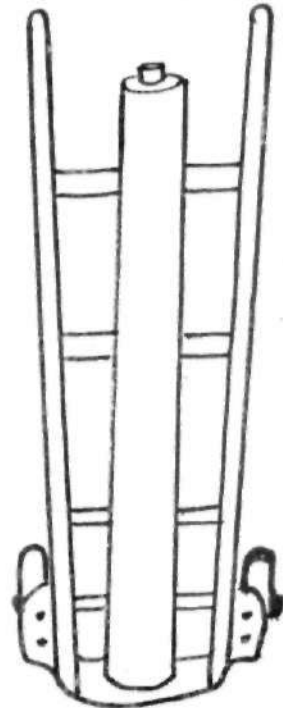
Developed or Exposed Polyester Film

TEI: 015a



Plain Polyester Film For Mounting

TE1: 016



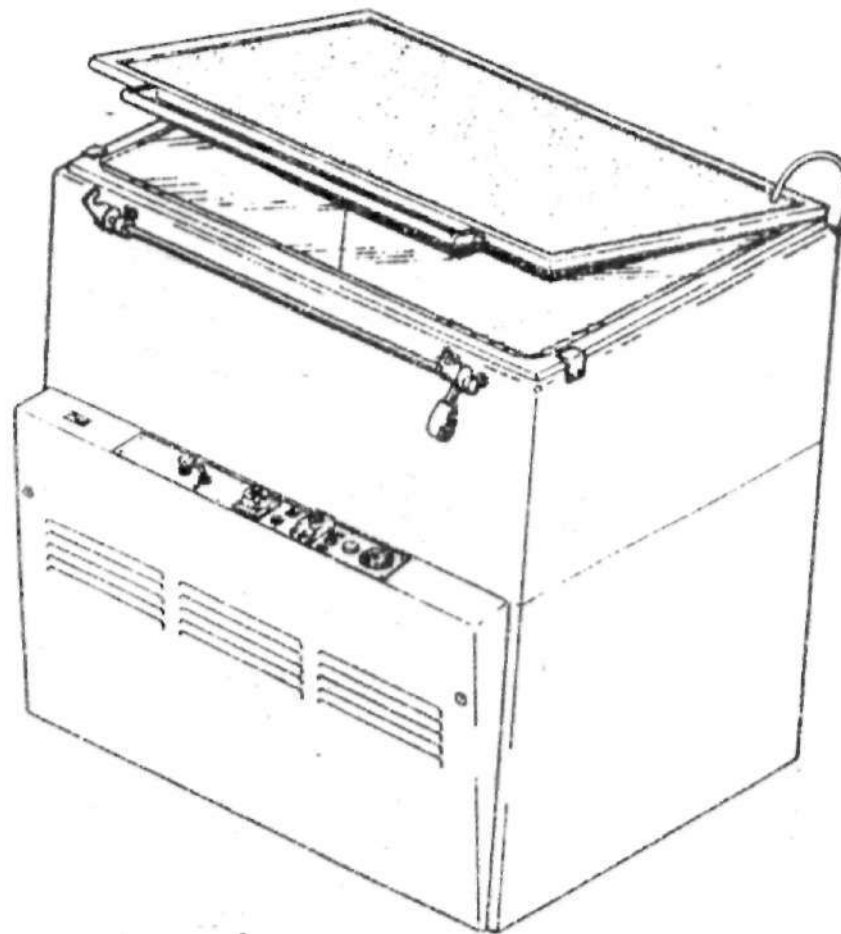
Copper roller on trolley

TE1: 017



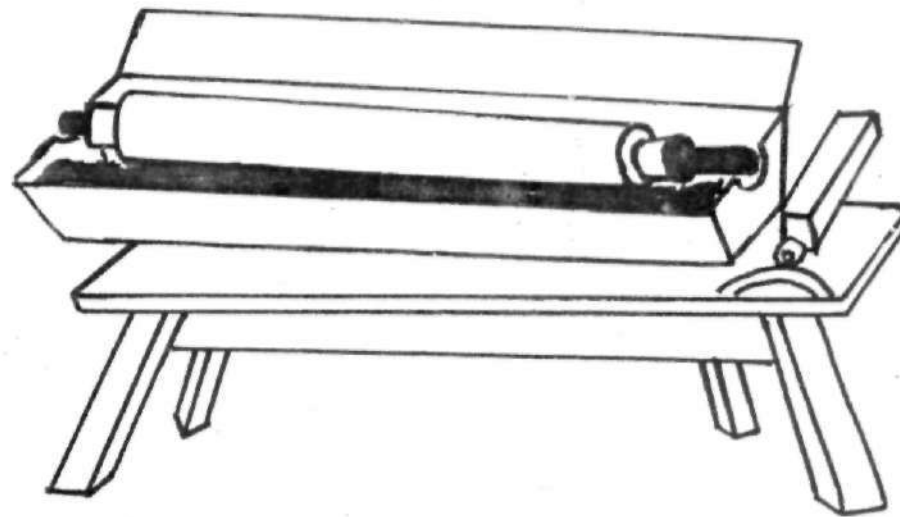
Rotary Screen roller

TE1: 018



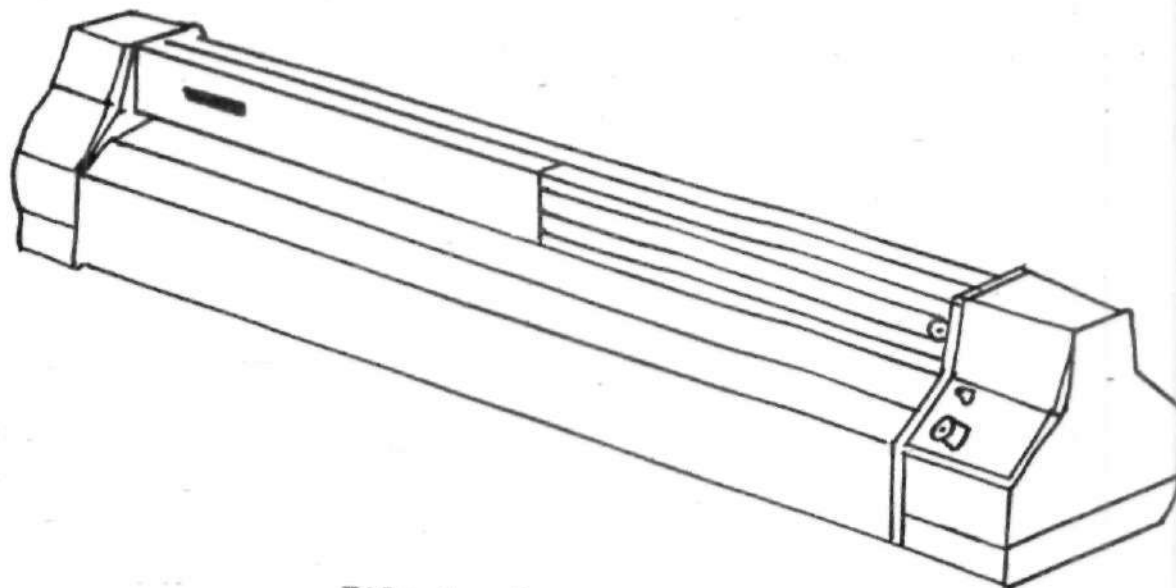
Copy Camera

TE1: 019a



Copper roller developing bath

TE1: 019b



Film developing machine

TE1: 020



Brushes



copper wire



carving knife



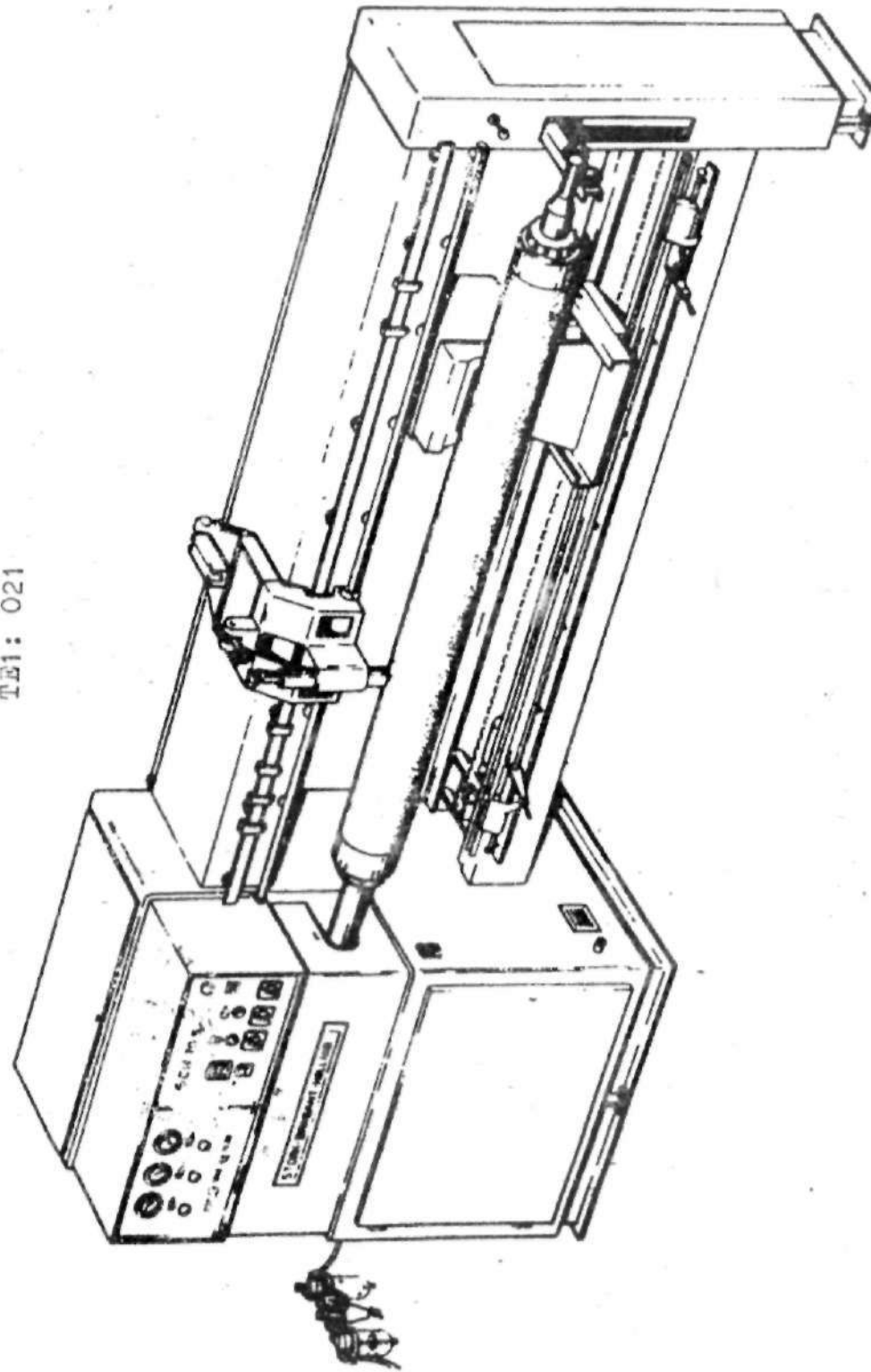
wire brush



engravers hammer

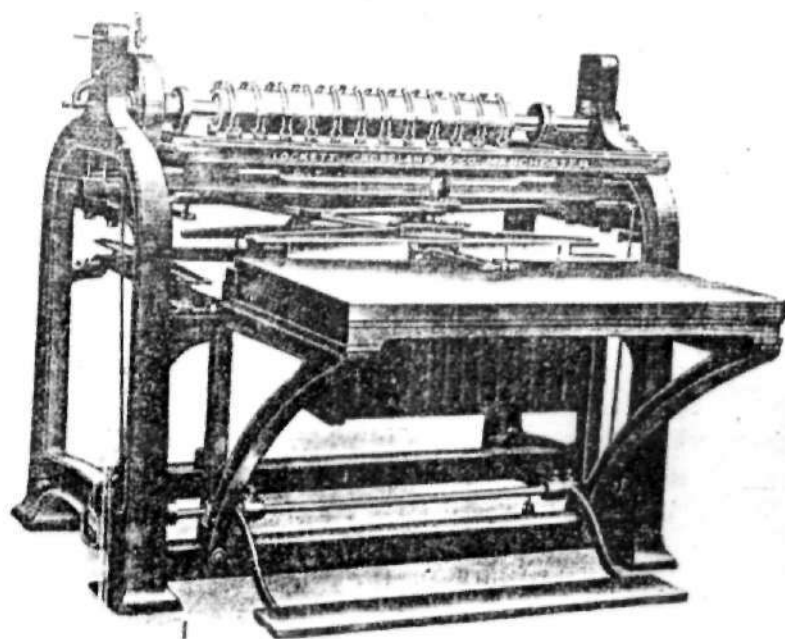
Roller etching tools

TE1: 021



Exposure machine for photographic transfer of design to roller.

TE1: 022



Pantograph design transfer machine.

In the academic institution, the tools and equipment for this process involves the use of tracing paper for colour separation, profilm for cutting of the design, or alternatively mesh coating agents, such as shellac, lacquer or super glue. In preparing the screen the screen board as in the picture TEA: 028 could be used to stretch out the mesh evenly with even tension for a firm grip of mesh on the frames. Some of the samples and pictures of the materials and equipment are shown below:

TEA: 021



Tracing Paper

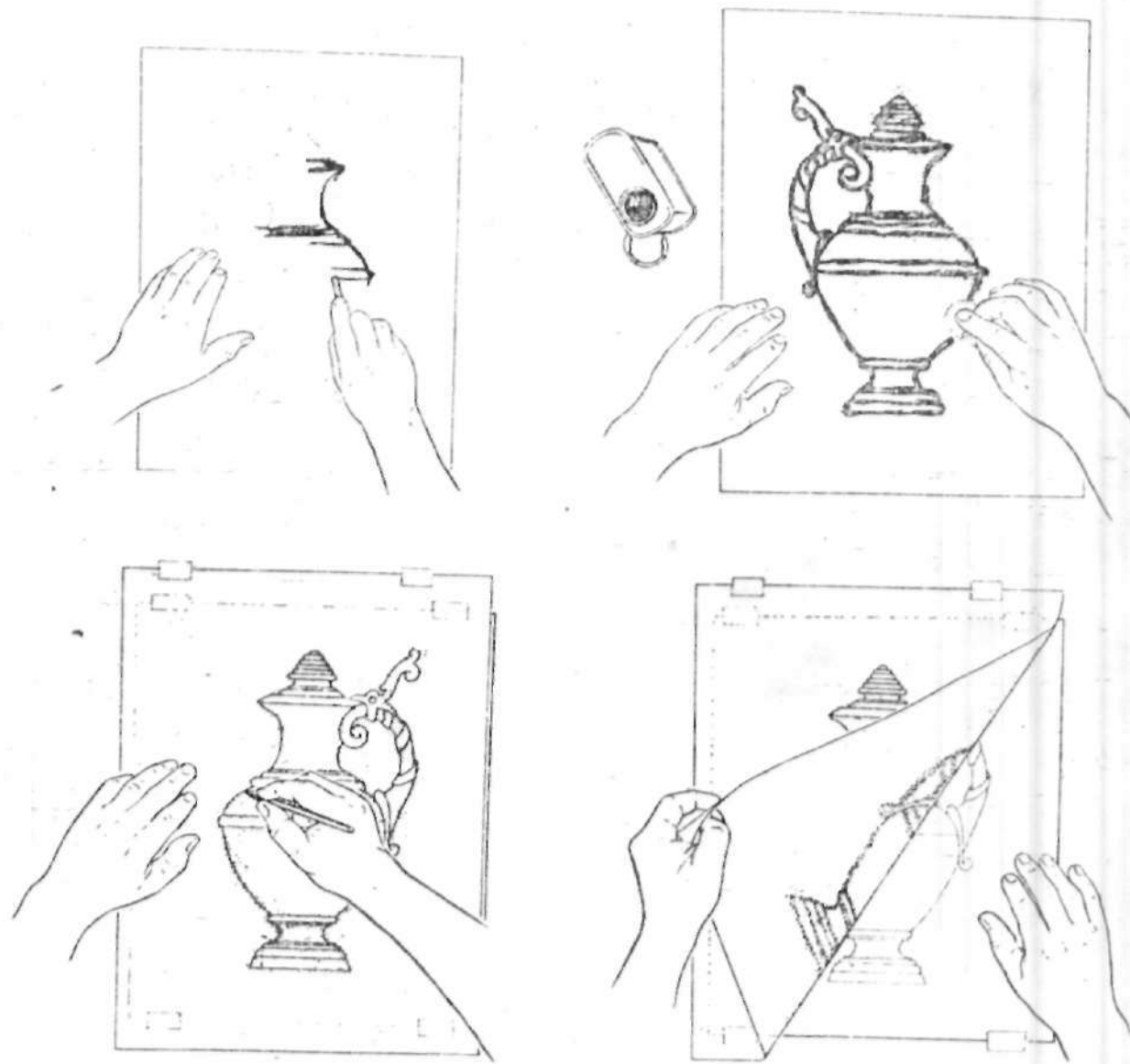
TEA: 022



Profilm

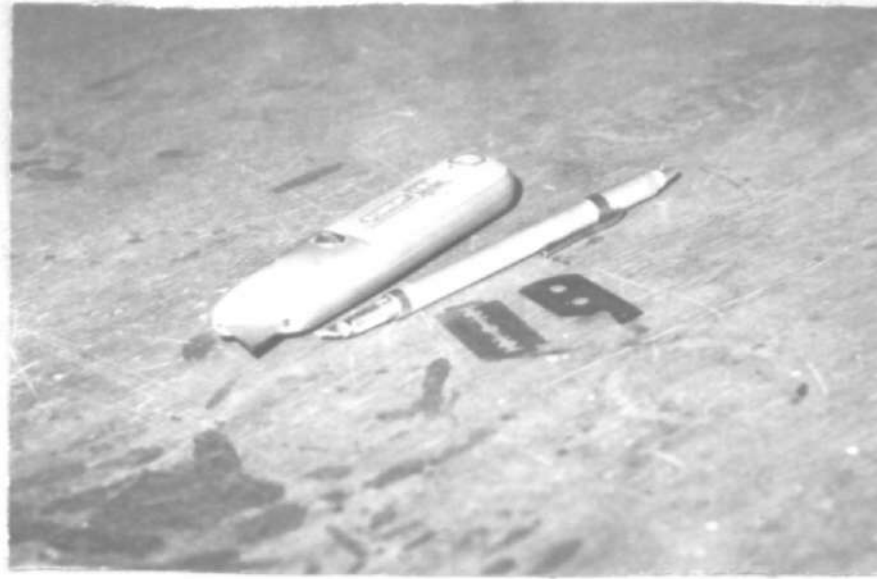
TEA: 023

Sample of Mesh



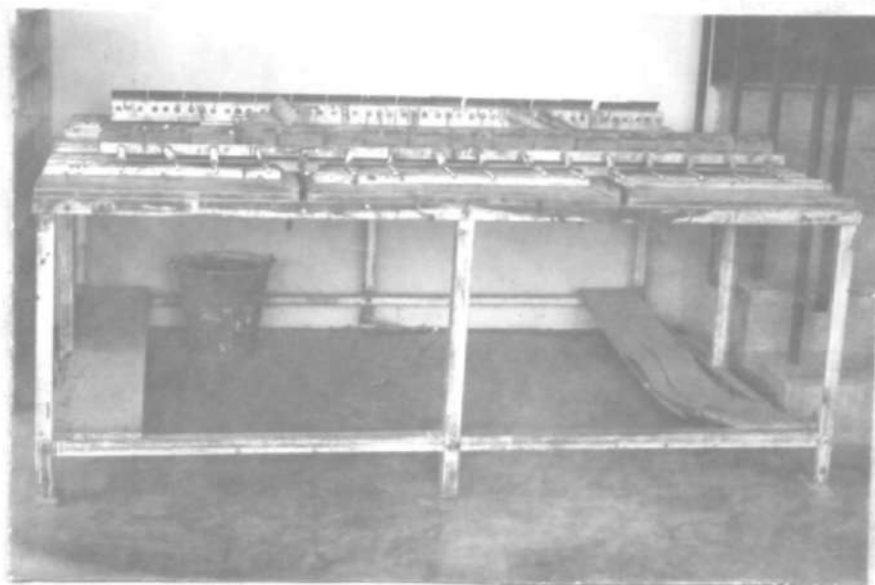
Tracing a design

TEA: 027



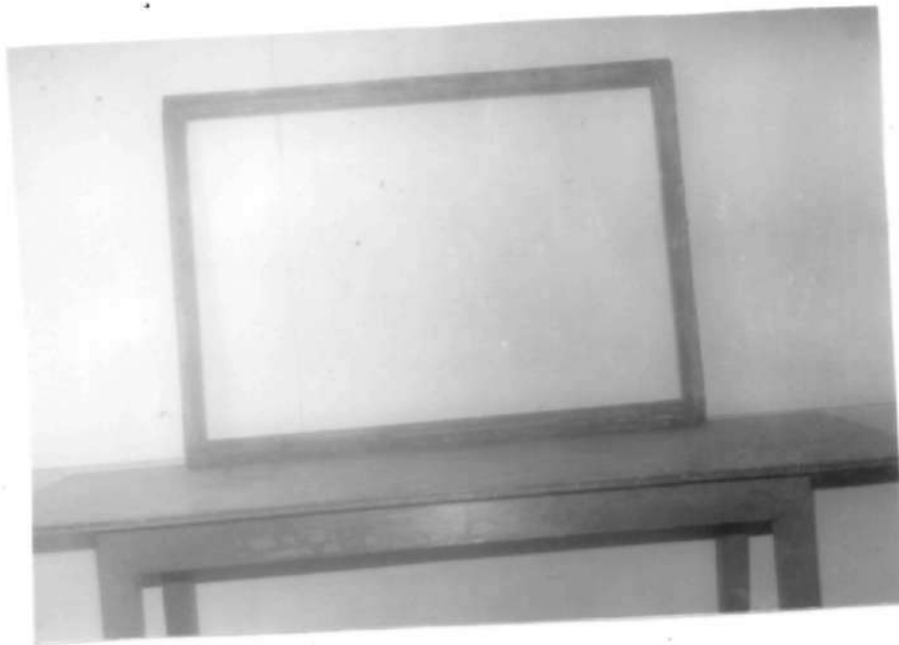
Cutting Tools

TEA: 028



Screen Preparing Board

TEA: 029



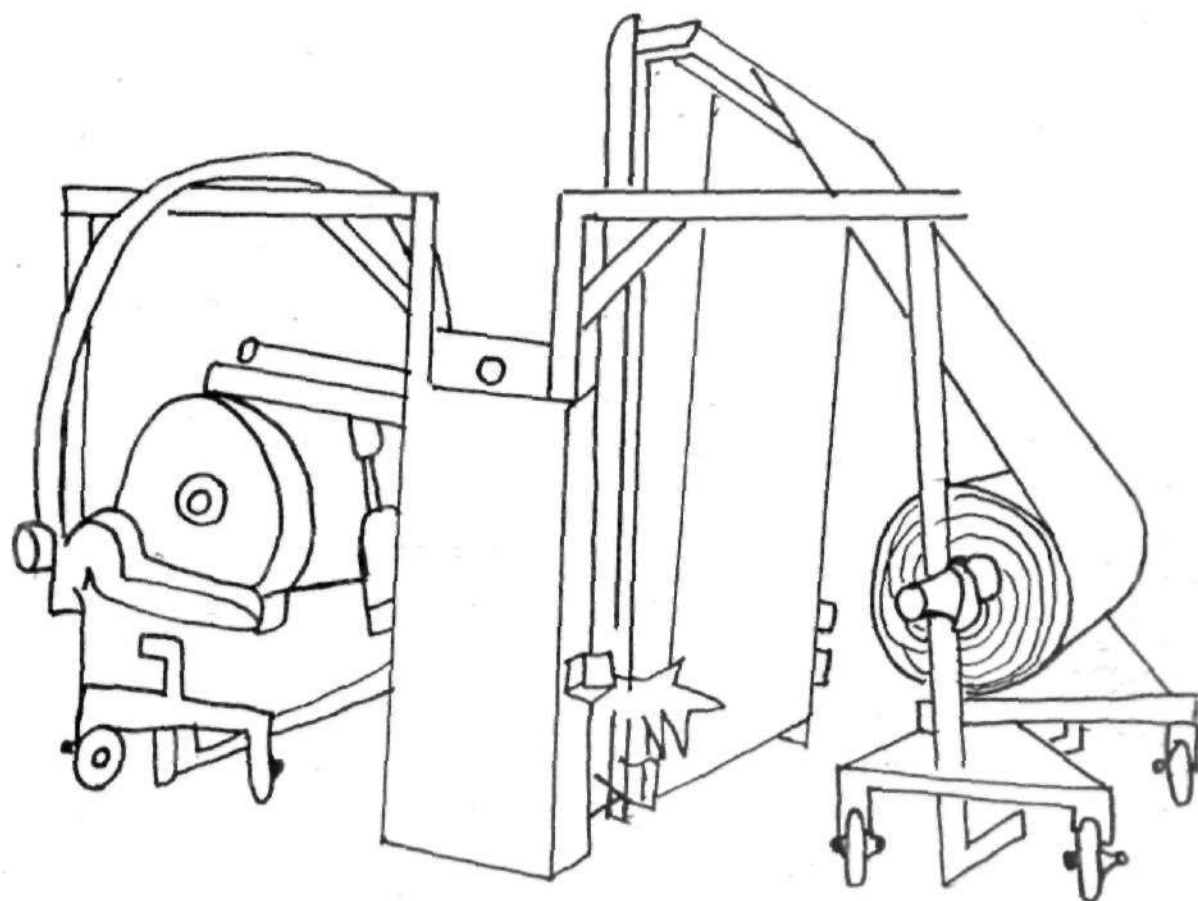
Screen Frame

Other transfer techniques in the academic institution are by direct drawing of the design on cloth such as in tiedye and batik. The designs can also be drawn by feather, brush or similar tools.

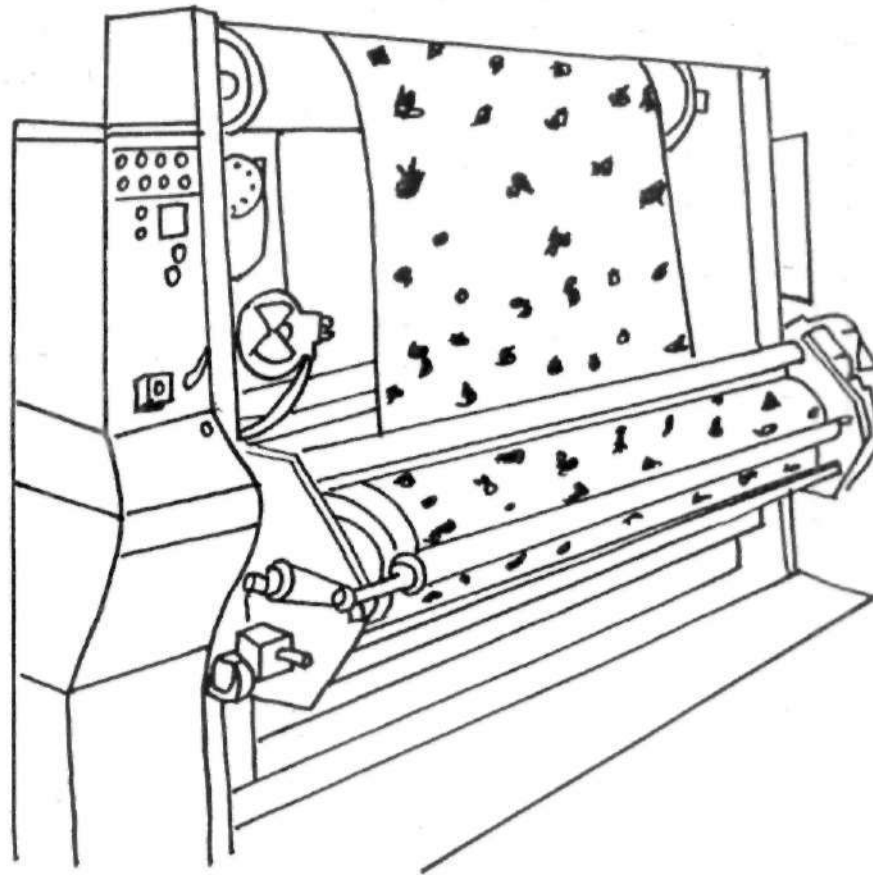
Printing And Dyeing Tools And Equipment

In this section of the industry the material goes through a lot of other processes involving the use of different tools and equipment at various stages in a continuous process. The fabric goes through the various stages of the power driven machines in open width or rope form depending on the process and the machine to be used. The fabric is pretreated first by desizing, scouring bleaching and mercerising before printing or dyeing. In printing, different types of rollers are used on different printing machines. The machines like copper roller printing machine and rotary screen printing machines are illustrated in forms and cross-section below.

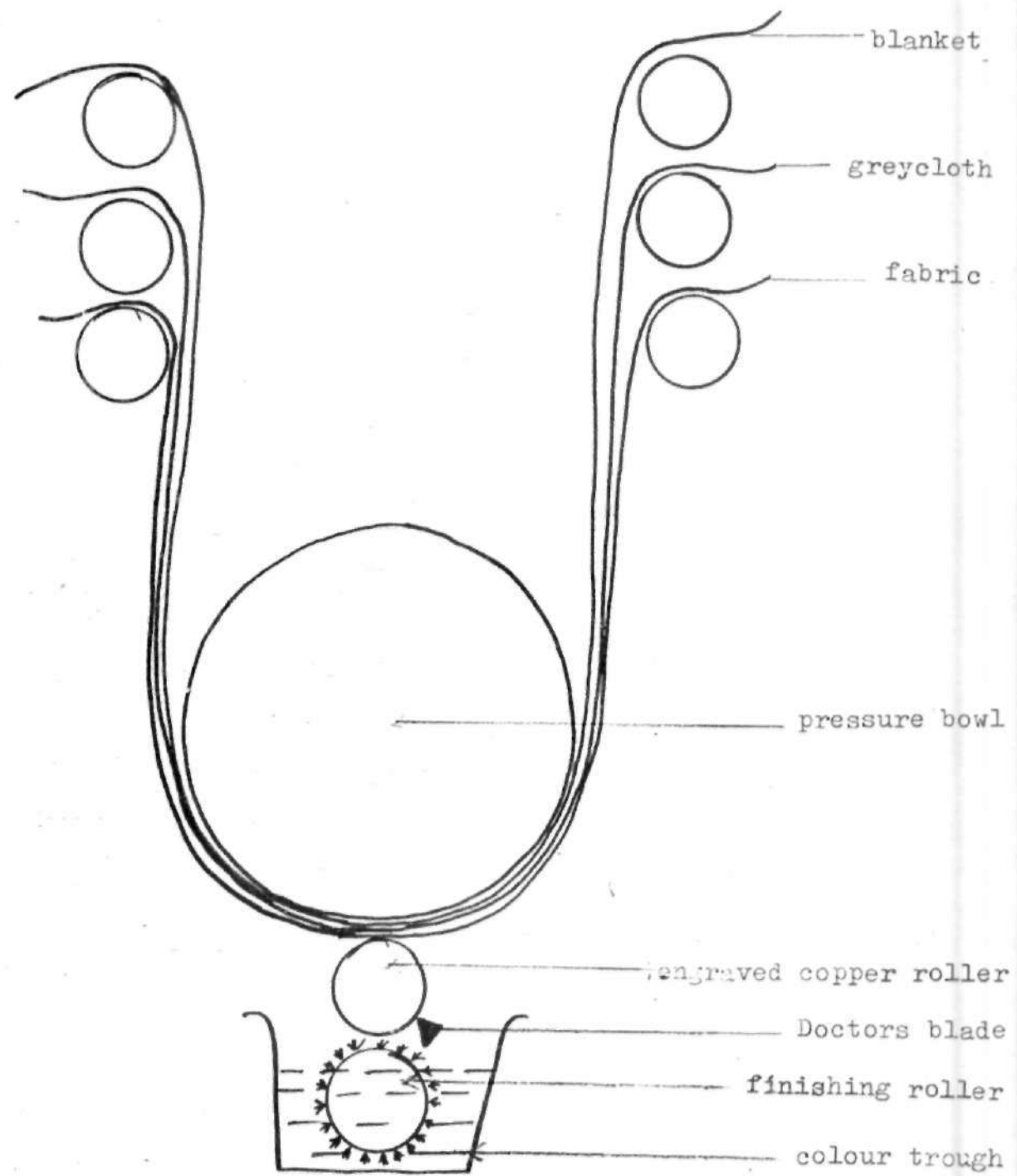
TE1: 074



TE1: 023a

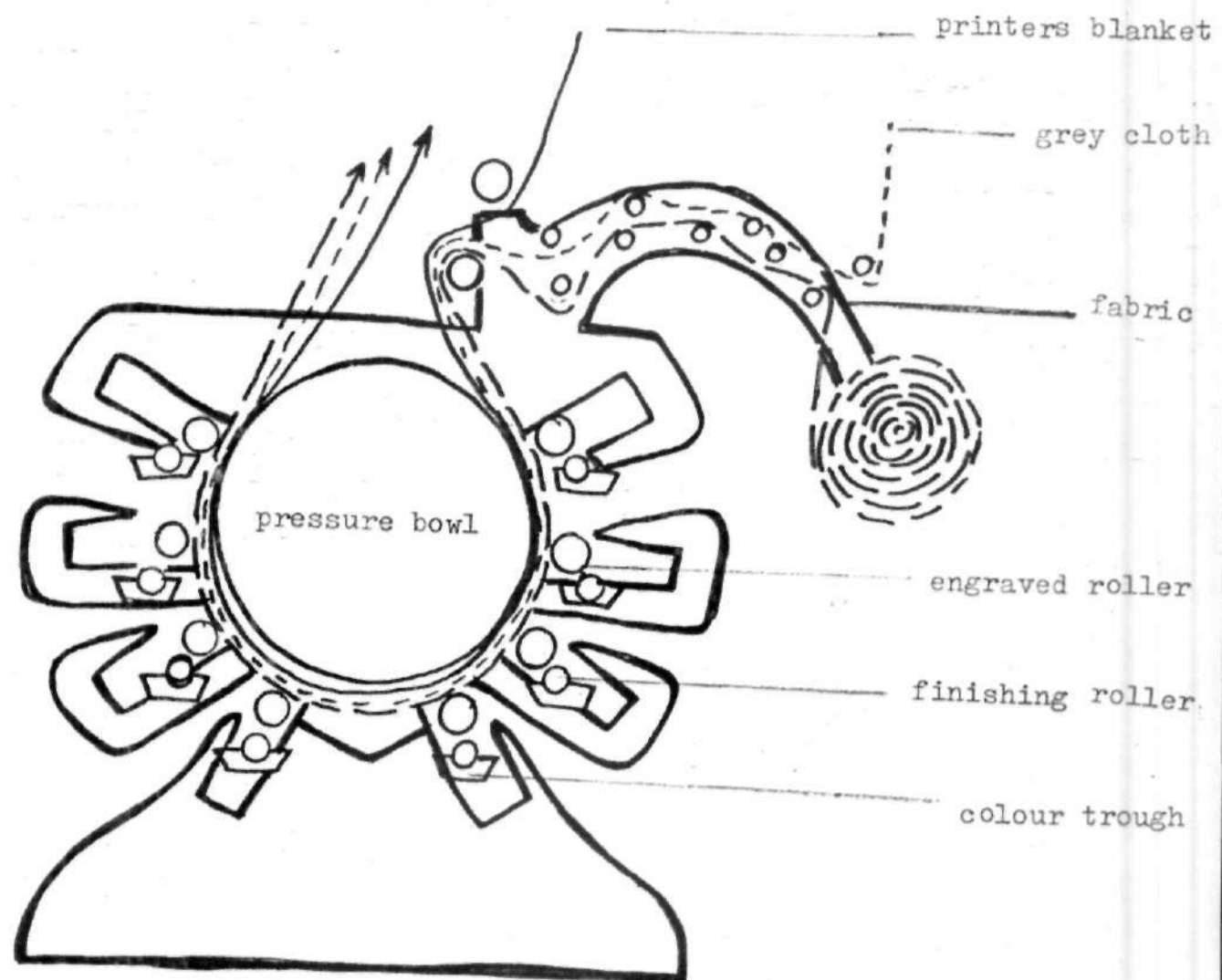


Roller printing machine



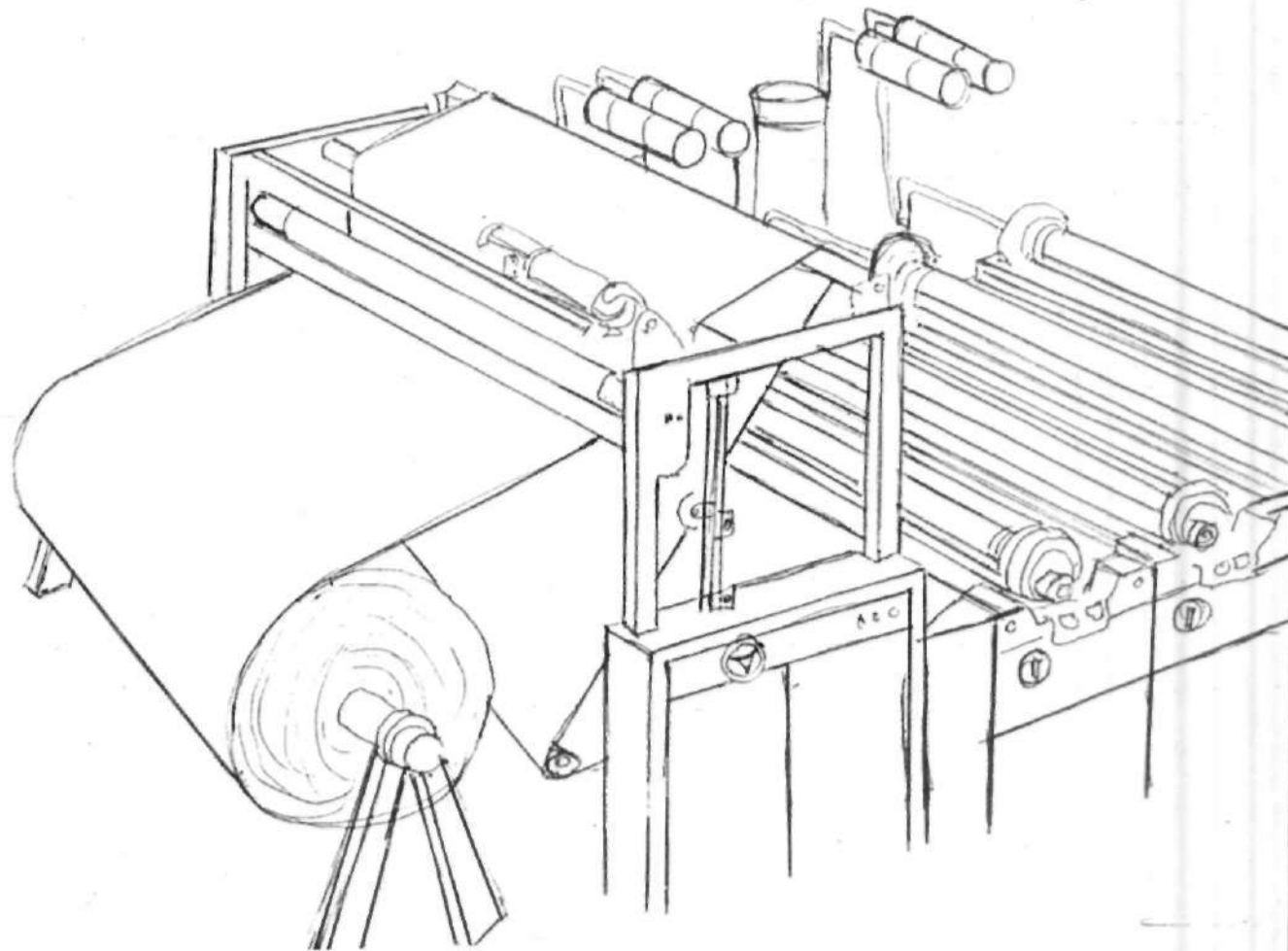
Cross section of single roller printing.

TE1: 023c



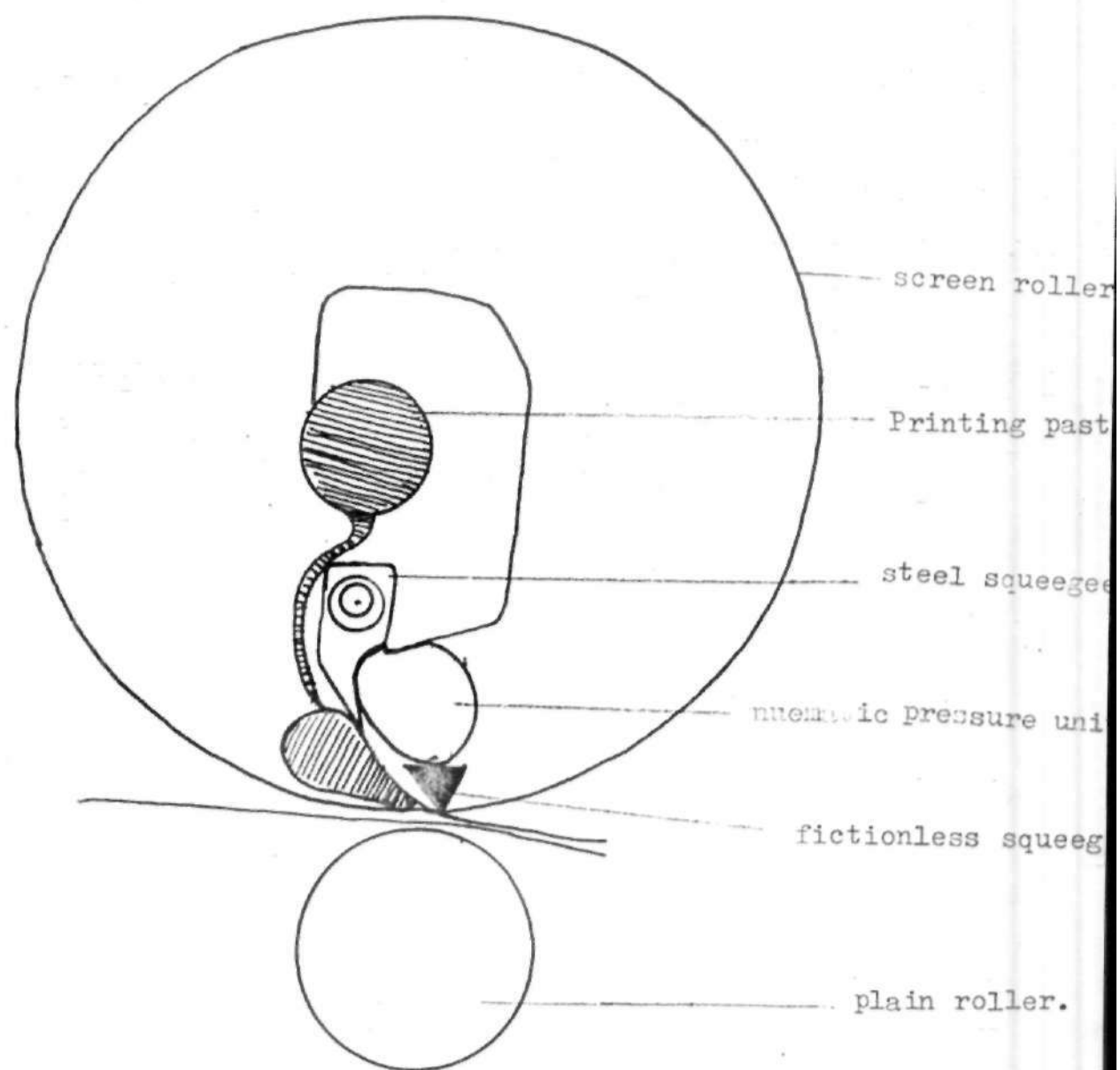
Cross section of eight copper roller printing machine

TE1: 024a



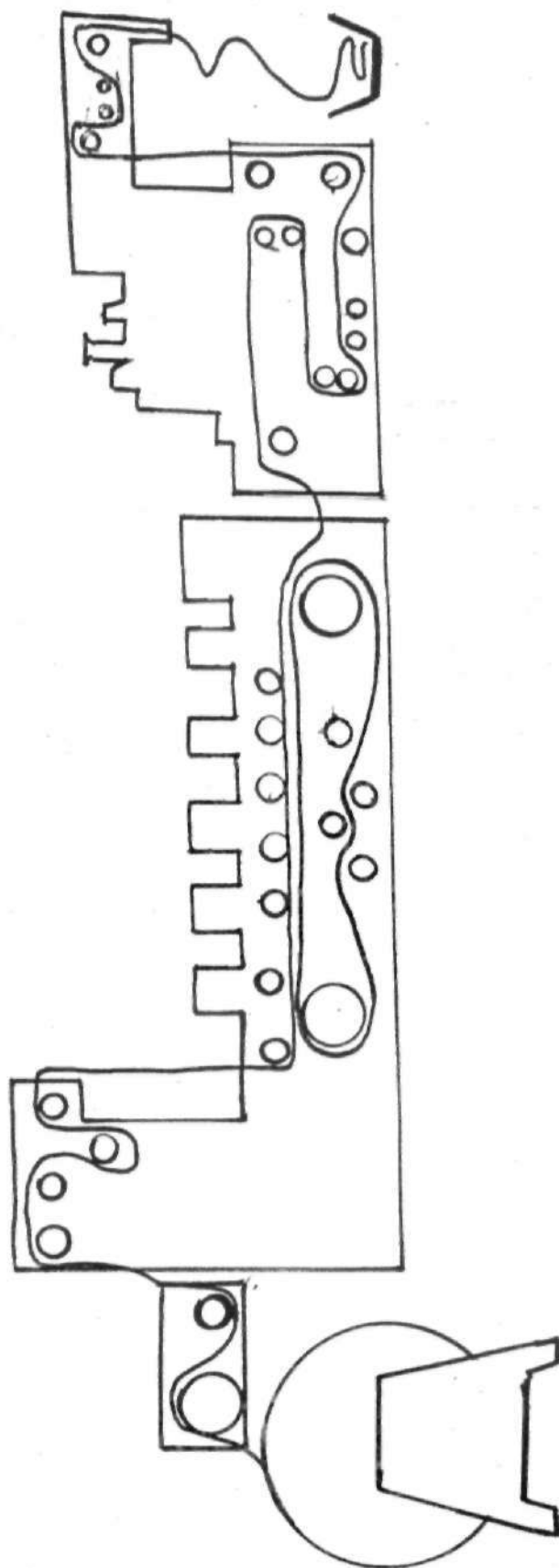
Rotary screen printing machine

TE1: 024b



Cross section of a single rotary screen printing roller.

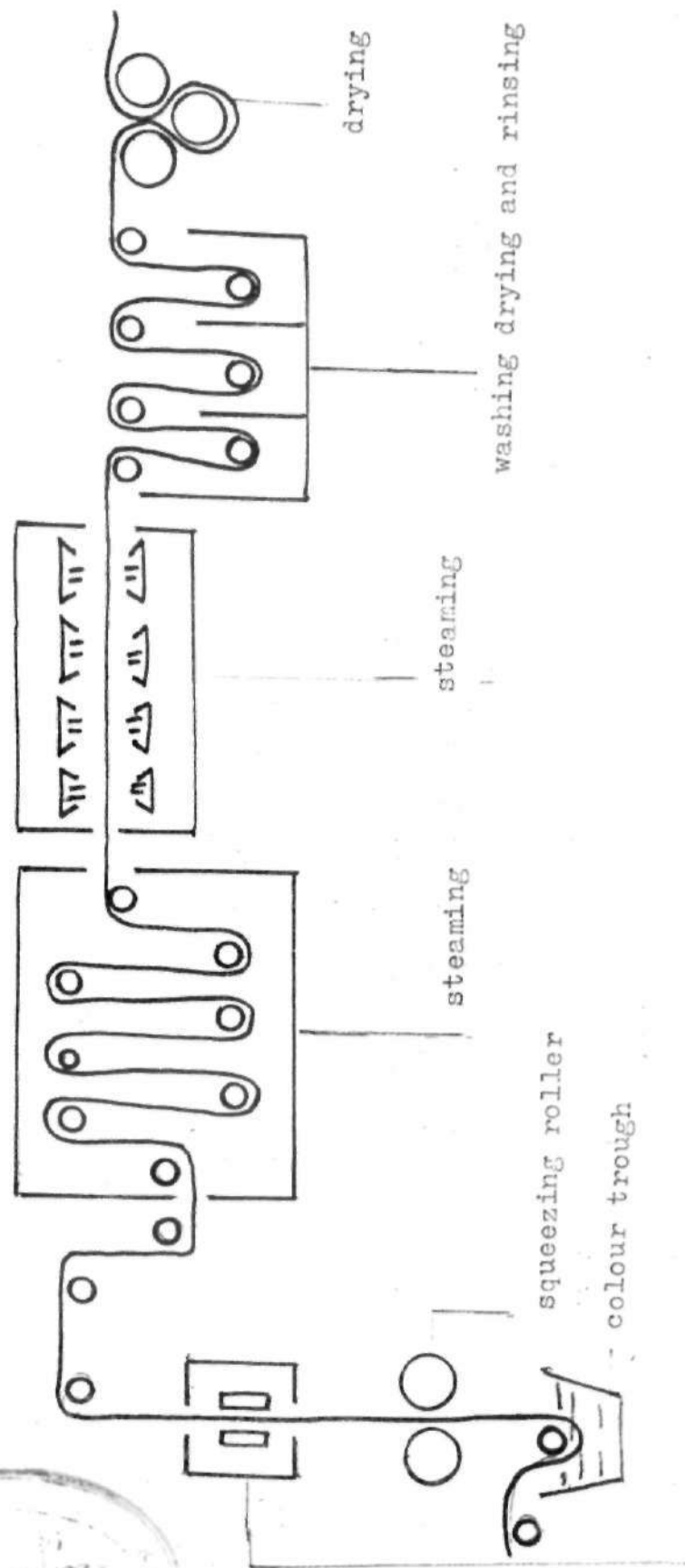
TE1: 024c



Cross section of rotary screen printing machine

2-14513

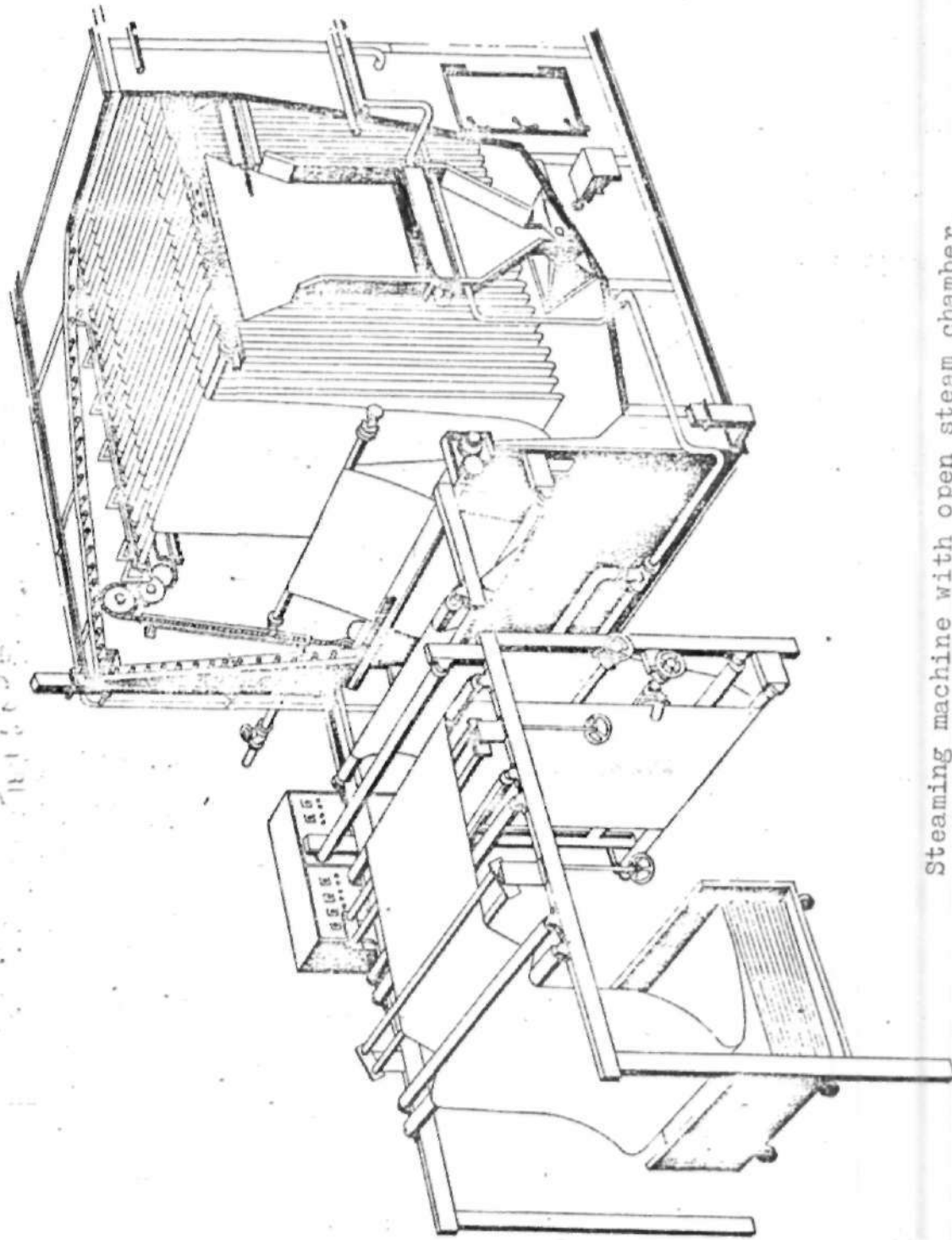
TE1: 025



A continuous dyeing range

After printing or dyeing, the dye needs to be set on the fabric. The setting of the dye is achieved by steaming as presented in the illustration below in the industry. The process of printing and dyeing is completed by calendering the fabric and folding as a finishing process. The steaming and calendering machine are as seen below.

TE1: 026



Steaming machine with open steam chamber.

TE1: 027



Calendering

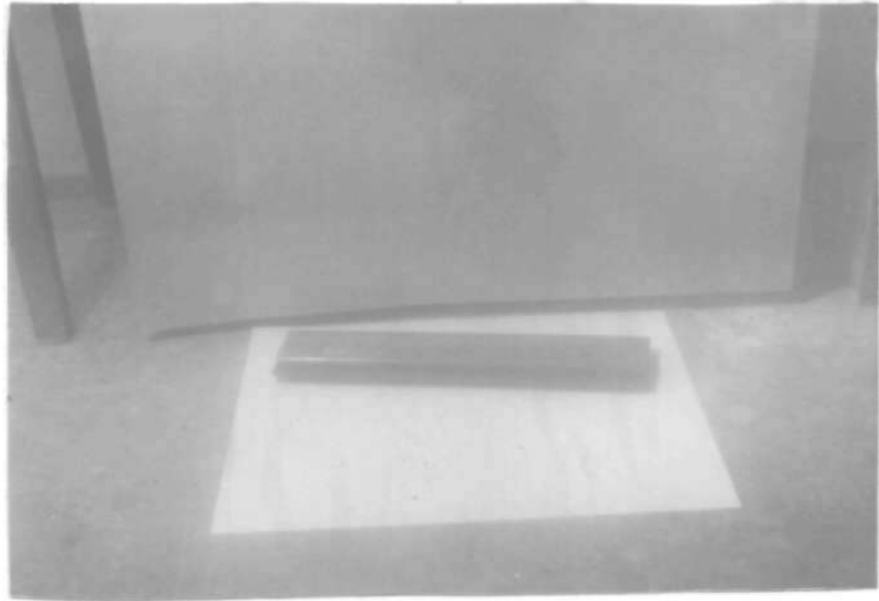
In the academic institution, the tools necessary for these processes include containers for washing off the impurities contained in the fabrics, long printing tables, the type of screen required for printing process and squeegee. Dyeing generally is done by dipping fabric in large containers. The starch resist fabric is accomplished by applying starch to fabric by either printing the paste on stencil or applying it direct with feather, brush and so on before dyeing. Finishing of the fabric in the academic institution is by oxidising the fabric, ironing and others like steaming. The illustrations below depict some of the tools and equipment involved in these processes.

TEA: 030



Containers For Washing And Dyeing Fabrics

TEA: 031



Squeegee

TEA: 032



Stretched Mesh on Frame

Spinning And Weaving Tools And Equipment

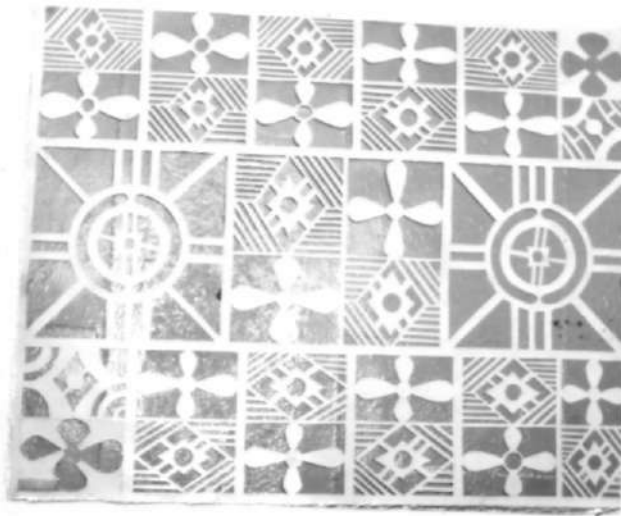
In the industry, the raw material goes through the cleaning stages, of combing and pulling before spinning. The machines involved at various stages are bale breaker in the blow room for opening up cotton and removing of impurities. The carding machine combs and spreads out the cotton. The drawing machine applies stretch and length to the cotton. The roving machine further thins it out for spinning which inserts either 'S' or 'Z' twist to the yarn on another machine. The yarns are then wound into spools and cones. The diagrams below show the tools and equipment involved in these processes.

TEA: 033



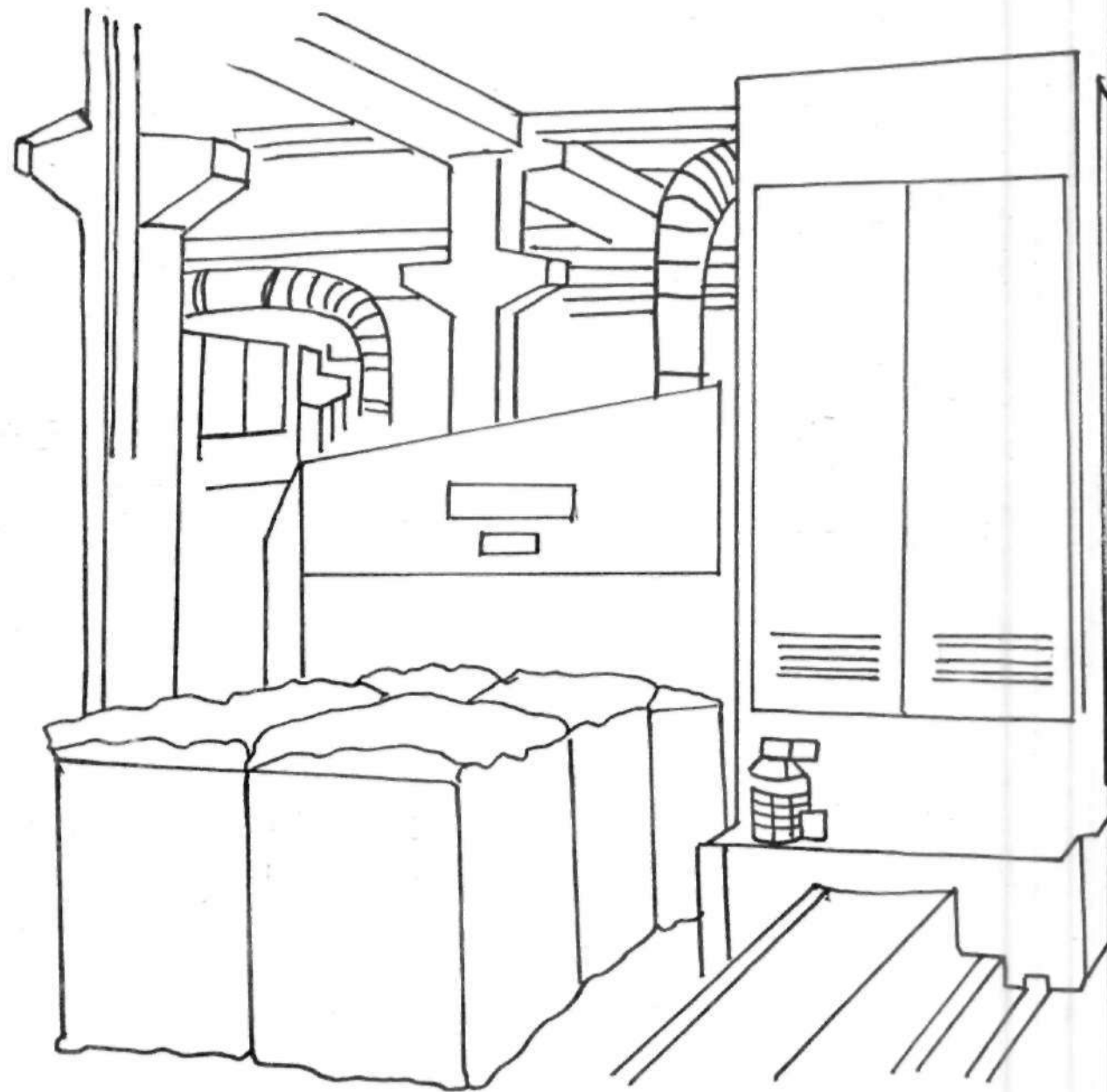
Printing on the Printing Table

TEA: 034



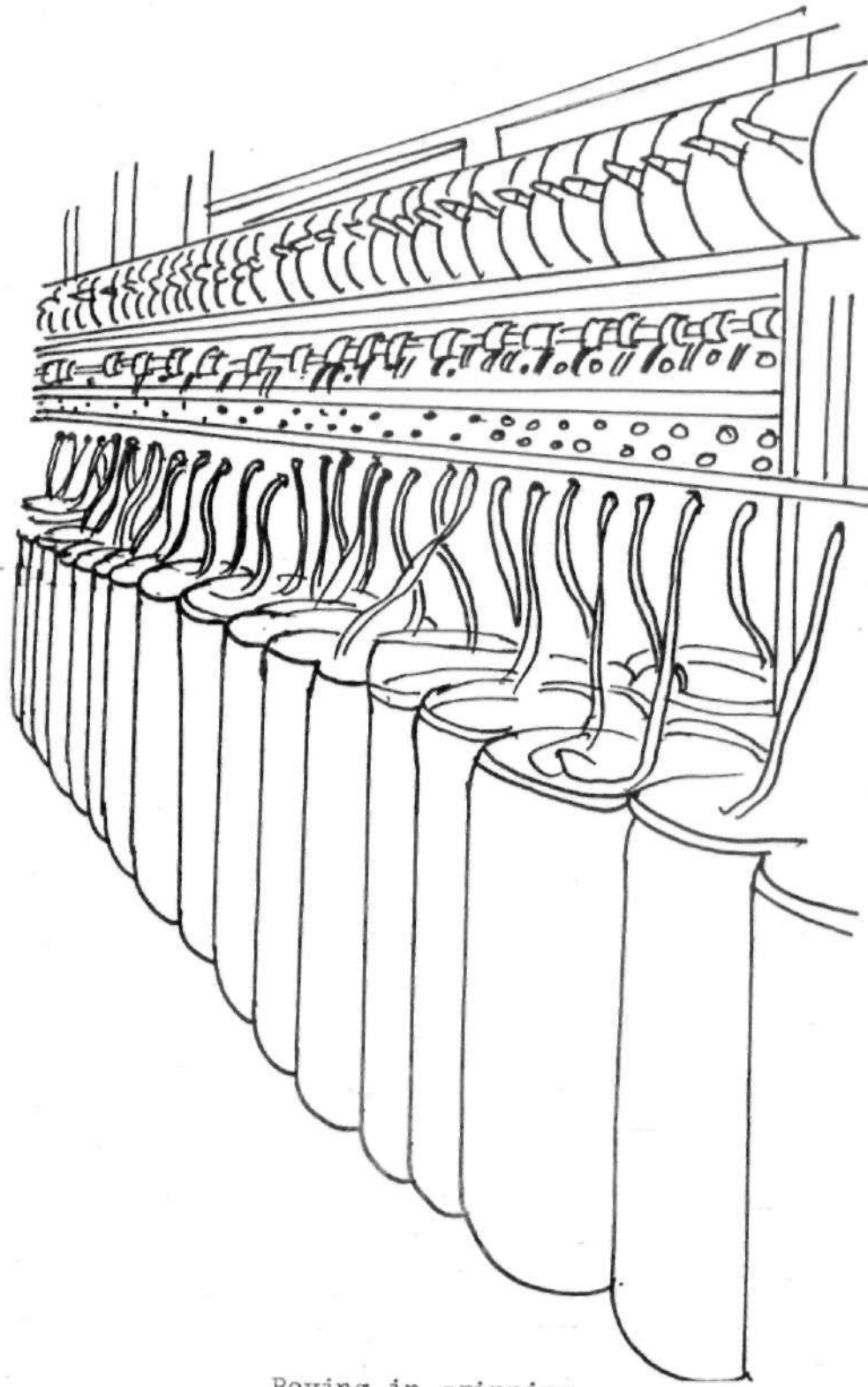
Sample of Starch Resist Stencil

SW1: 028



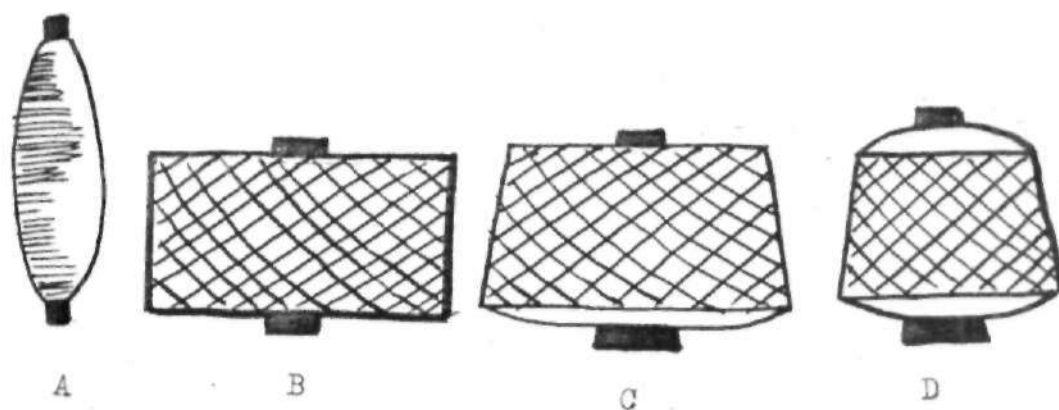
Bale breaker

SW1:



Roving in spinning

SW1: 033



A Cop

B Parallel - sided cheese

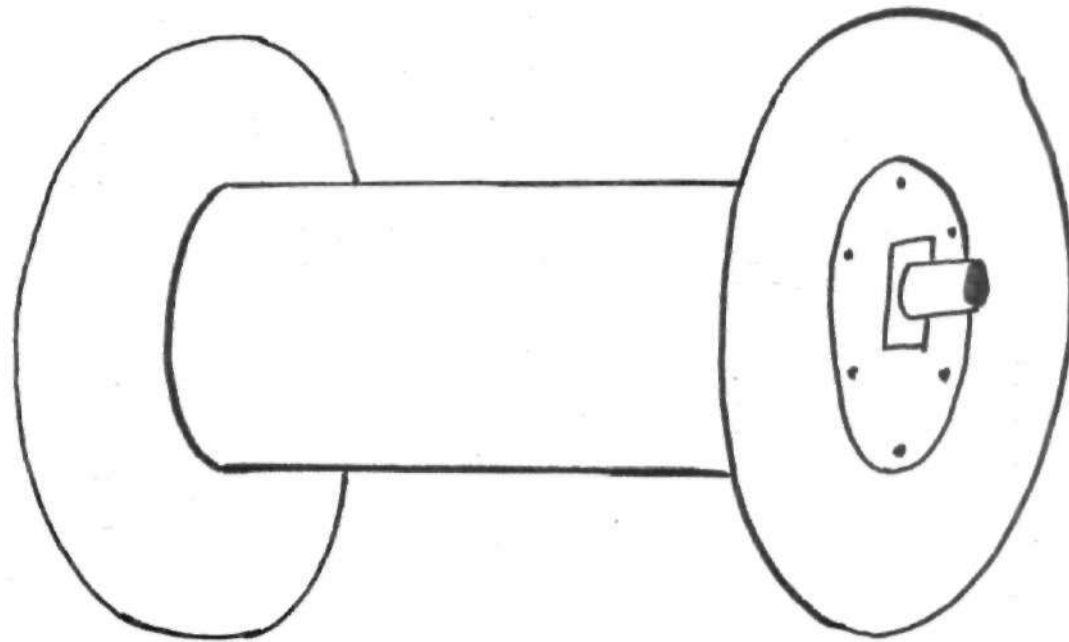
C Cone

D Pineapple cone.

Cones and spools

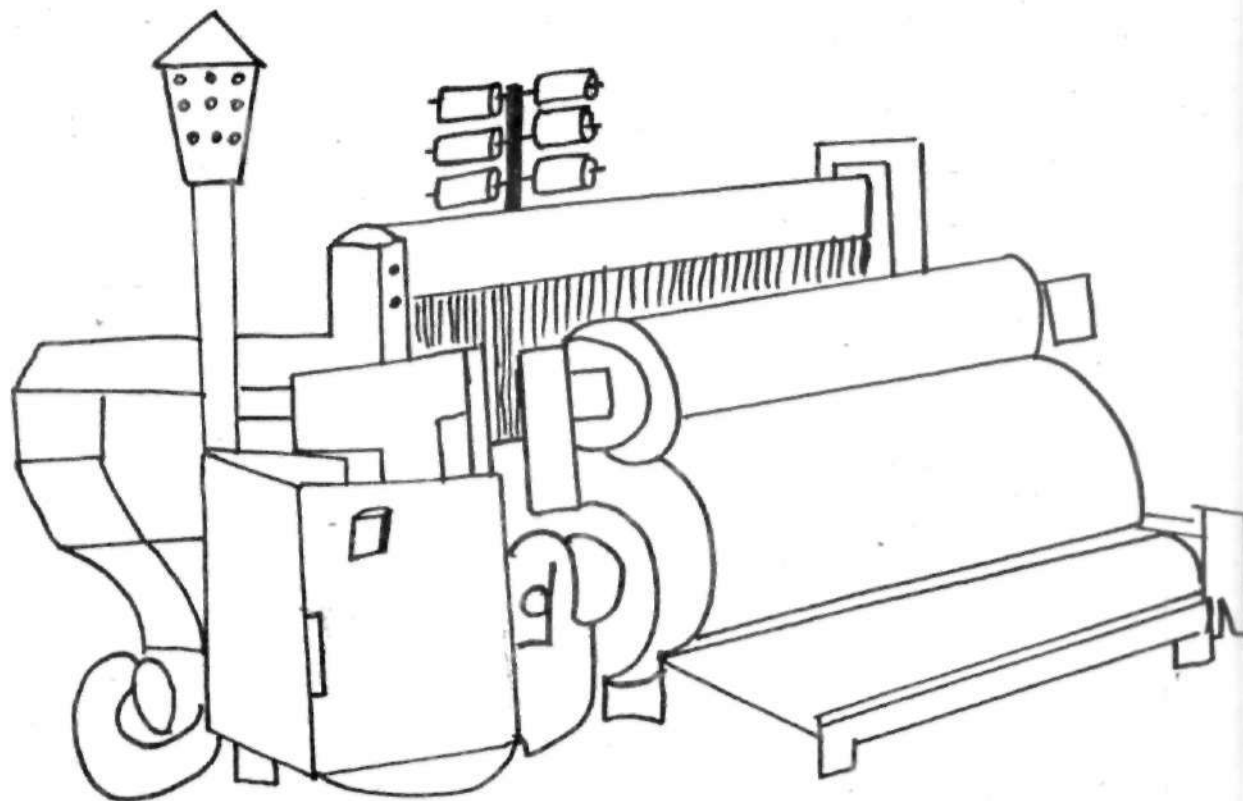
In the area of weaving, spooled yarns are converted to warp yarns and wound onto beams. The weft yarns are wound onto bobbins to fit into shuttles for the process of weaving. The tools and equipment necessary for this process consists of warp winding machines, beams for rolling on the warp, sizing machine, shuttles and bobbins for carrying weft yarns as well as various types of motorised looms. The looms observed were the power driven looms producing plain weave types, dobby looms and Jacquard for producing patterned weaves. The pictures below show some of the equipment.

SW1: 034



Warp beam

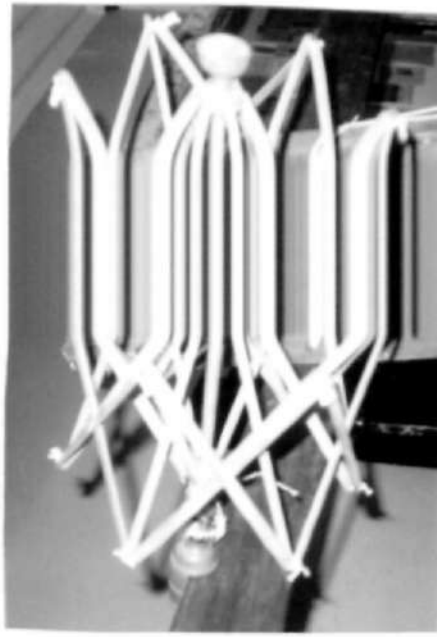
SW1: 054



Motorised Weaving Loom

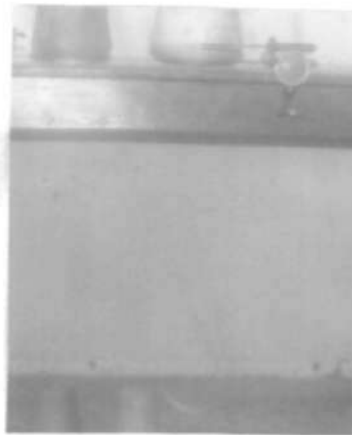
While the industries use mechanised and power driven processes, the academic institution generally use manual operation. In the area of weaving in the academic institution, already spun yarns are bought from the market in hanks. The yarns used are usually bigger in counts than those of the industry. There are possibilities for using thinner ones on finer reeds as well. Tools and equipment found here consist of hank winder for holding yarn in position during the process of unwinding. The warp yarns are wound on the warp winder. For the weft yarn, bobbins for boat shuttles are wound on bobbin winder and the long shaft shuttles are wound manually by hand. In the academic institution the loom types used are the contemporary non-motorised floor and table types. Other types found are the traditional women's loom, frame loom and inkle loom. The pictures below are samples of these tools and equipment.

SWA: 035



Hank Winder

SWA: 036



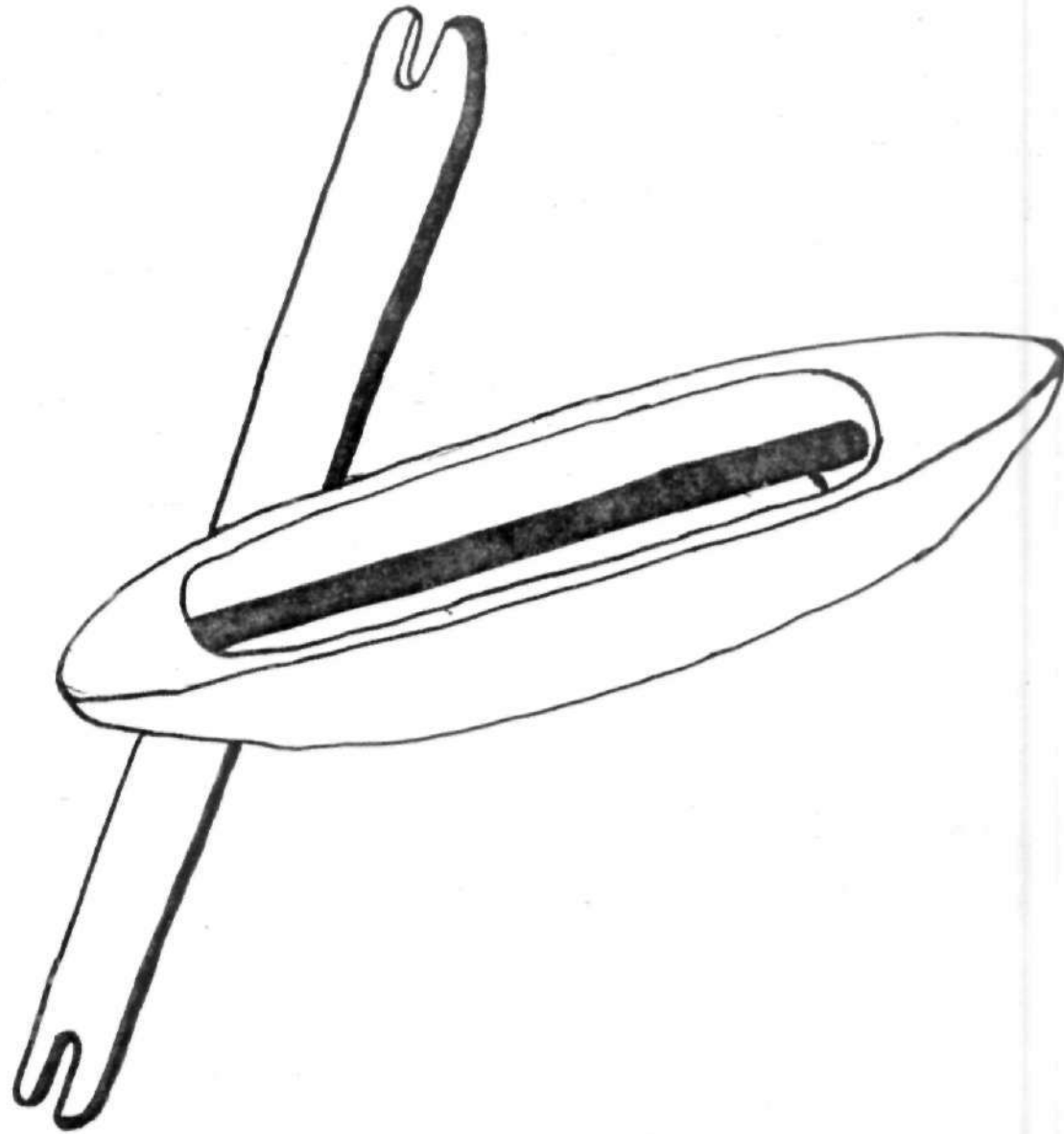
Bobbin Winder

SWA: 037



Warp Winder

SWA: 038



Shuttles

SWA: 039



Floor Loom

SWA: 040



Table Loom

SWA: 041



Inkle Loom

SWA: 042



Traditional Women And Frame Looms

3.5.4. Printing And Dyeing

In printing and dyeing, the fabric goes through various processes of pretreatment before printing, dyeing or finishing. The untreated woven fabric from the weaving section is referred to as grey cloth. The pretreatment given to this fabric, is to ensure easy and level penetration of dyes to the fabric. Pretreatment is started by desizing the fabric to remove the starch content used to size the warp yarns in the weaving process. The next step is scouring to remove impurities such as grease and oil. The grey cloth produced is off-white in colour and so to achieve pure white colour, it is bleached. This bleaching treatment is sometimes followed by mercerisation of some fabrics to make the material more absorbent and also have lustrous looks. The fabric is passed through a concentrated solution of caustic soda and under tension.

Another aspect in the pretreatment is the stentering which involves stretching out the fabric while remaining under tension, it is passed through steam to reduce shrinkage. The fabric is pulled out to the required size before it goes in for printing or dyeing.

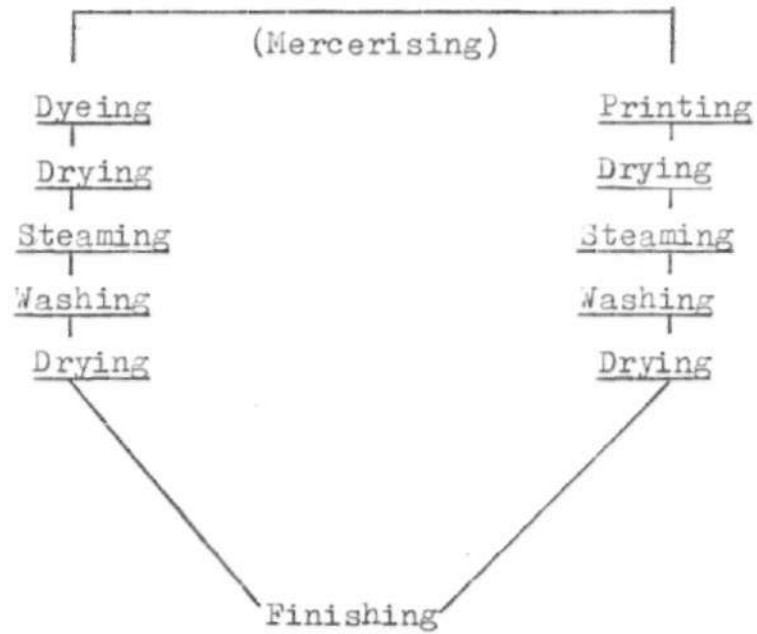
FDI - 041

Grey Cloth

Desizing

Scouring

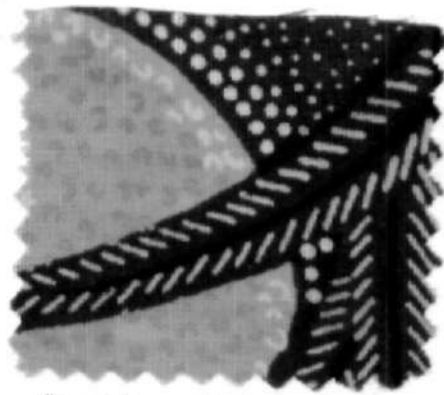
Bleaching



Movement of fabric from pretreatment to fabric dyeing or printing.

After these processes the fabric is ready for dyeing or printing. The nature of the design and roller used, produces the varying effects in fabric types, as they are displayed by the fabric samples below.

PDI: 045



Sample of Java Print

PDI: 046



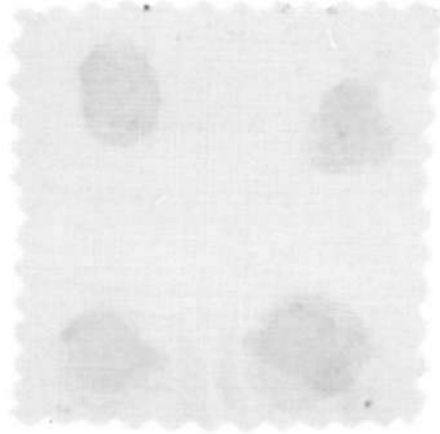
Imitation Wax Print

PDI: 047



Tetron And Cotton Print

PDI: 048



Dyed Cloth

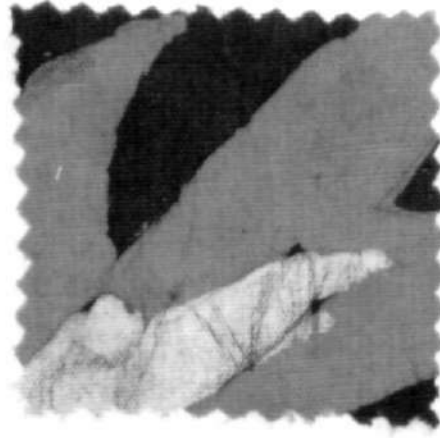
PDI: 049



Real Wax Print

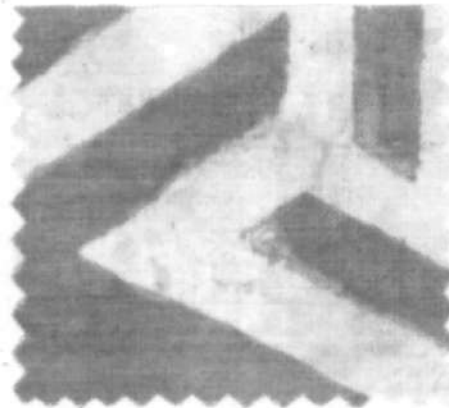
In the academic institution as it is in the industry, the processes followed are pretreatment, printing or dyeing and finishing. These are done within the limitations of the available facilities in the academic institution. The procedure and equipment differ from the mainly mechanised industrial types. Fabric printing in the academic institution is done by hand on flat padded table and dyeing in plastic dye baths. The pretreatment given to the purchased fabric used for dyeing or printing is washing. This is a form of removing the finishing applied to the fabric like starch. Other sophisticated techniques could be used. This is by using chemicals to desize and bleach the cloth. The followings are the samples of various types of fabric printing and dyeing in the institution.

PDA: 068



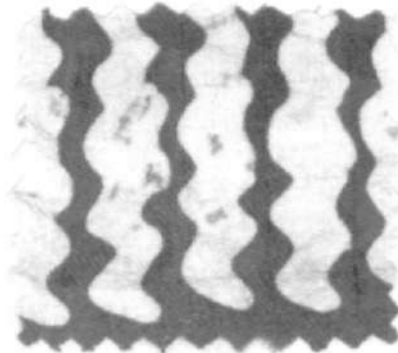
Batik Sample

PDA: 069



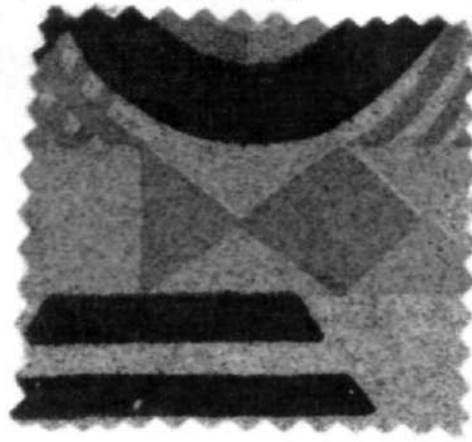
Starch Resist Sample

PDA: 070



Block Print Batik Sample

PDA: 072



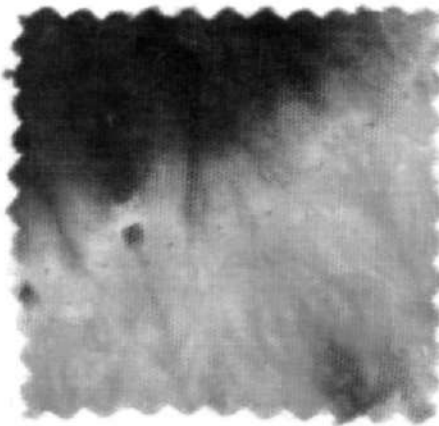
Printed Dress or Furnishing Design Sample

PDA: 074



Imitation Tiedye Sample

PDA: 077

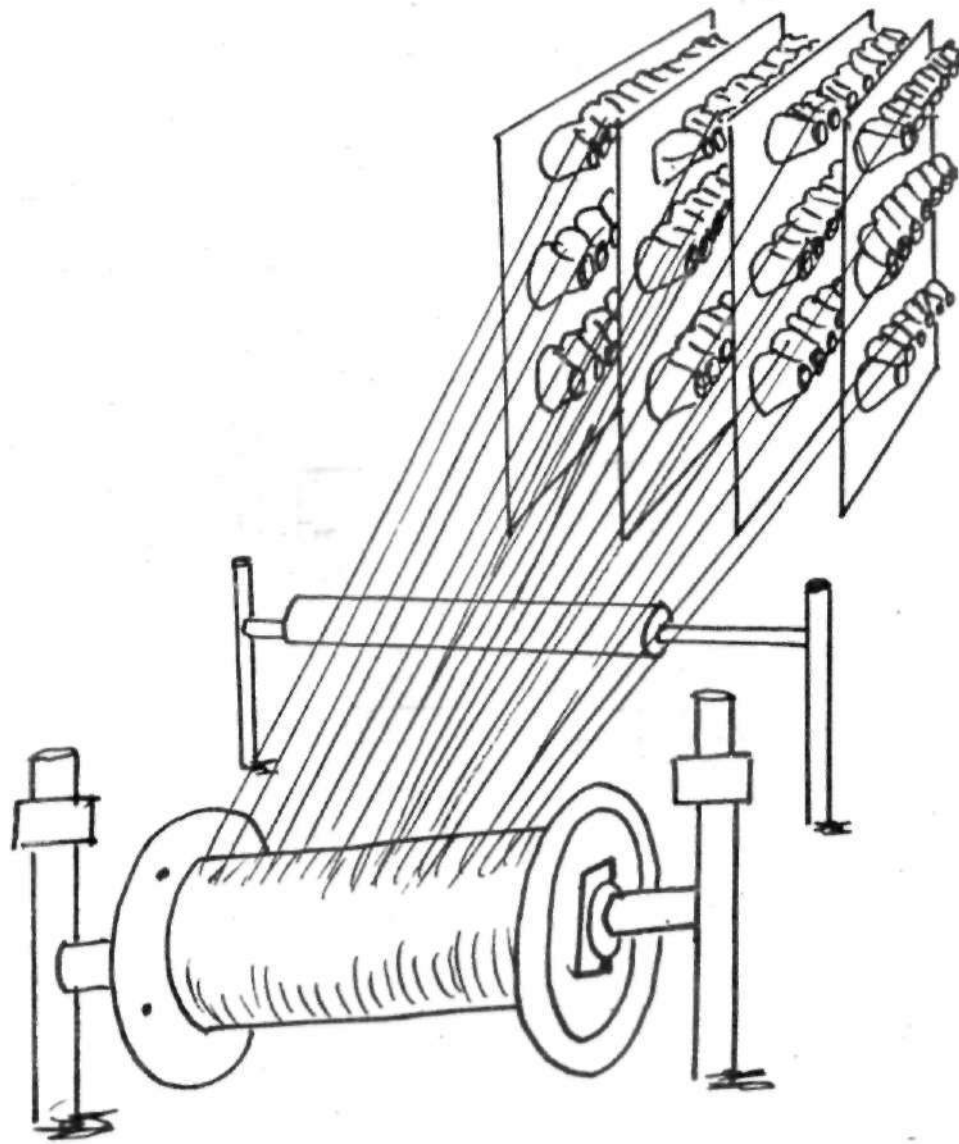


Real Tiedye Sample

3.5.5. Weaving

This process involves the interlacing of warp and weft set of yarns under tension. In the industry, spooled yarns are wound as warp yarns on the beams are sized. This sizing make the warp yarns strong enough to withstand the rigours in weaving. The structural design is applicable in weaving. The design is translated into the warp in the draw-in-draft by varying the order in which each individual yarn (pick) comes through the heddles in different harnesses. The yarns are brought through the reed on the loom and tied to another beam in front of the loom and weaving commences. Different sheds in the warp are opened for inserting the weft yarn carried on the shuttle. The illustrations below are various stages of the process in the industry.

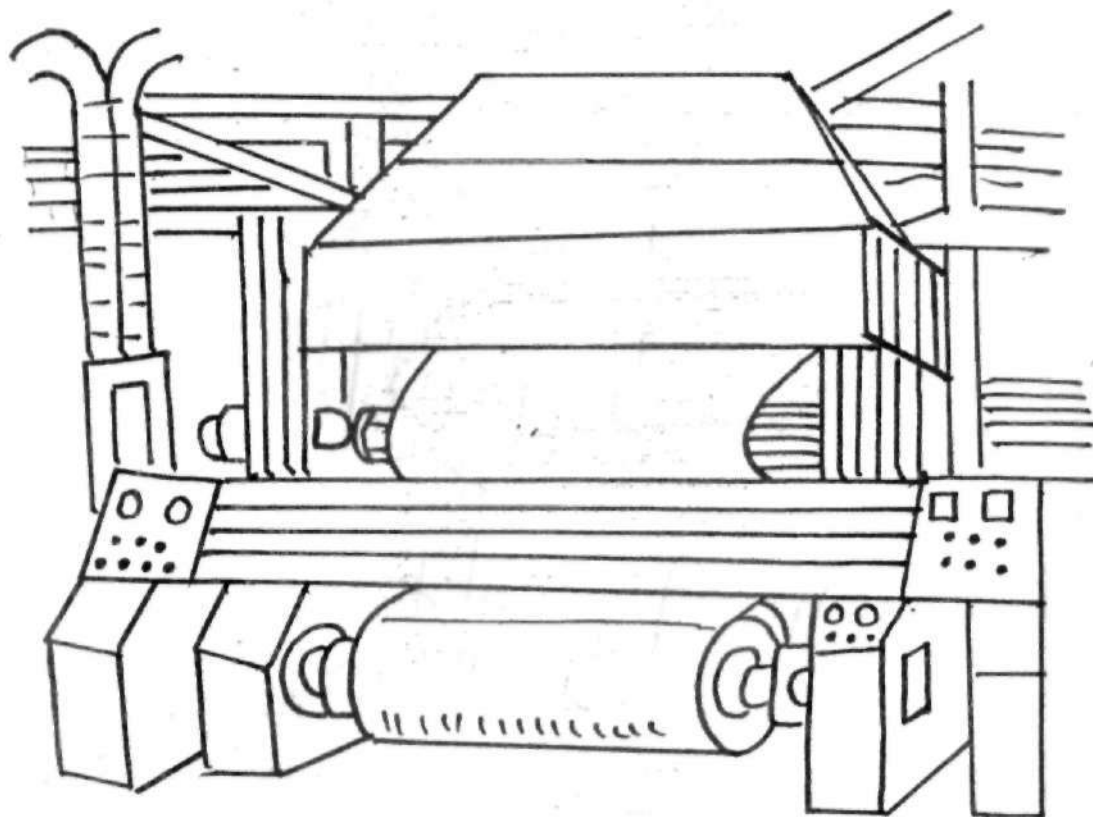
SW1: 052



Warping yarns from spools on to beam.

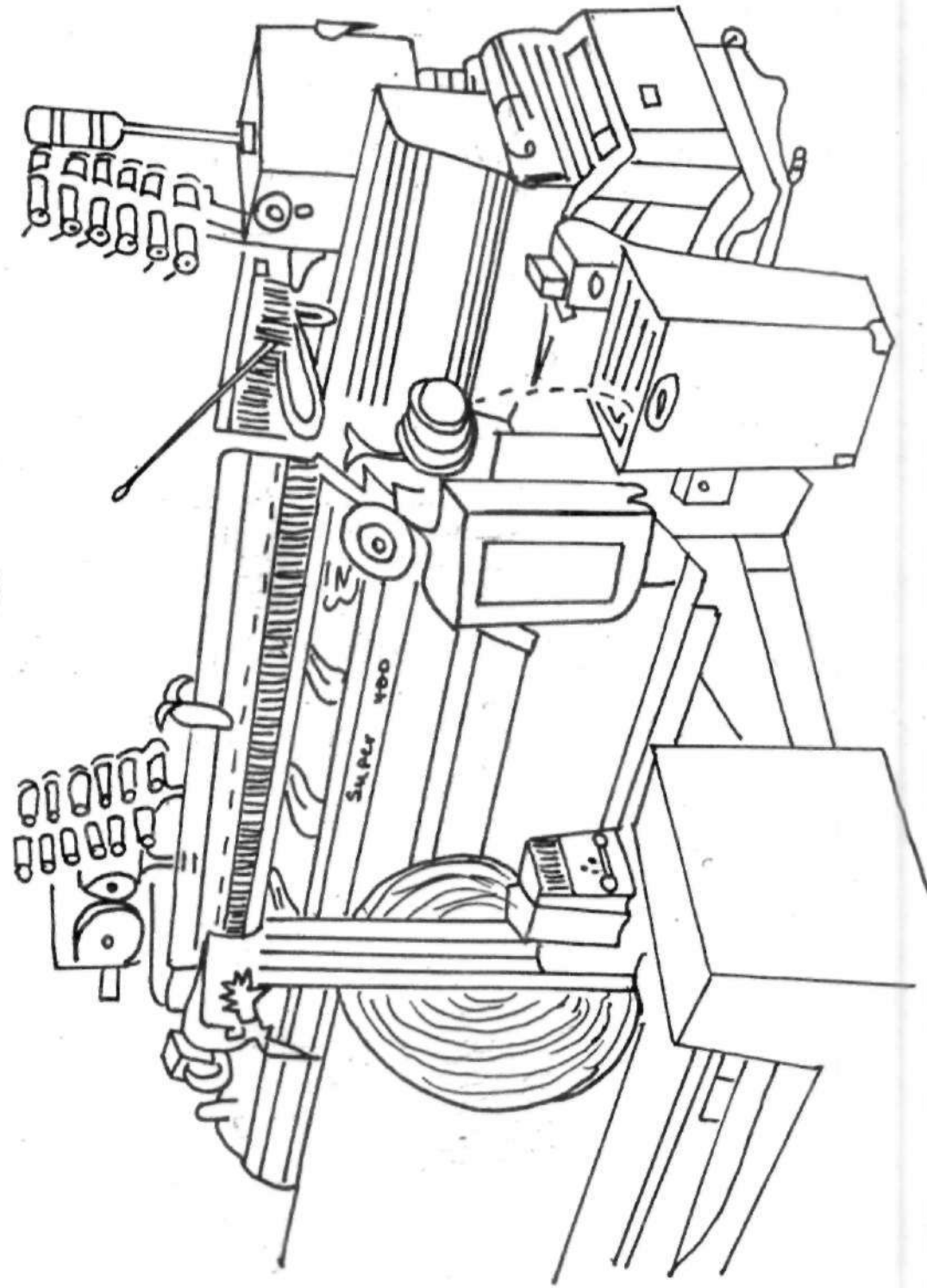
12-8

SW1: 053



Sizing the warp yarns

SW1: 039



Weaving on power driven looms.

The woven fabrics from the industry result into varieties of plain and patterned weaves. The plain weave variation occur in the density and yarn count of the yarns used. The patterned weaves are produced on the dobby and jacquard looms. The following samples are the woven types from the industry.

SWI: 055

68 x 46
(25^s)

Plain Weave of 68 epi by 46 ppi on 25^s yarn count

SWI: 068

Plain Weave of 90 x 56 (20^s)

SWI: 069



Plain Weave 72 x 60 (25^B)

SWI: 070

Patterned Weave From Dobby Loom
72 x 60 (25^B)

SWI: 071



Dobby Loom Patterned Weave 72 x 60 (25^B)

The process in the academic institution begins with warping on the warp winder. The warp is moved to the loom and tied to the beam, it is rolled up under tension. The draw in-draft is done on the loom through the heddles in the harnesses and through the reed that controls the density and tied to the front beam of the loom. The design of the weave depends on the arrangement in the warp and the lifting of the sheds for weft insertion. The pictures below show some of the processes involved and some of the variations of weaves produced.

SWA: 043



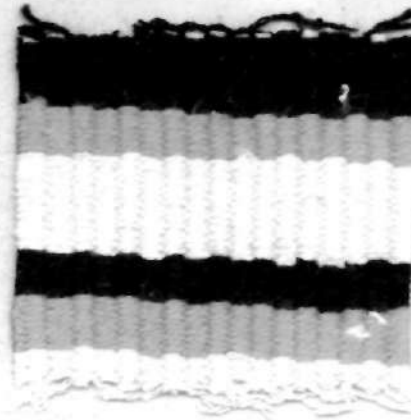
Warping Yarn On Warp Winder

SWA: 044



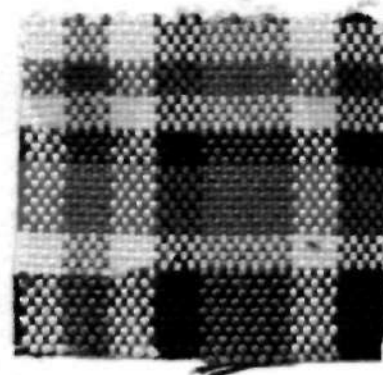
Rotting Warp Yarns to Beam

SWA: 055



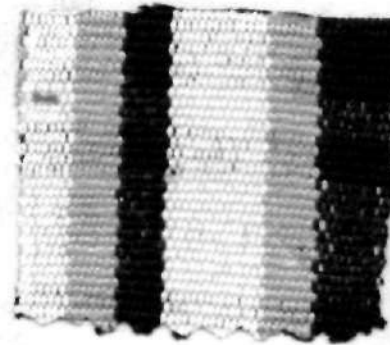
Wefl Faced or Tapestry Weave 7 x 14 (16^S)

SWA: 068



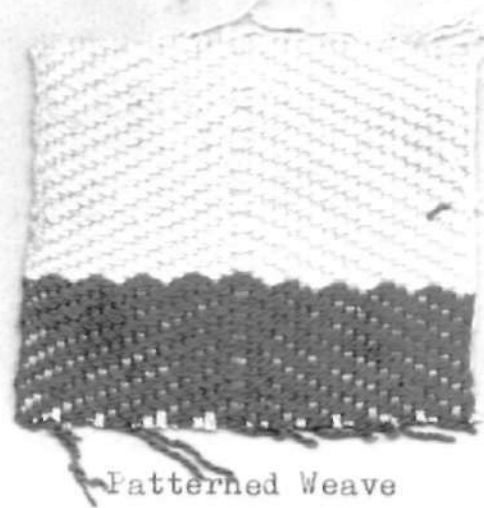
Checked Tabby or Plain Weave 28 x 14 (16^S)

SWA: 069



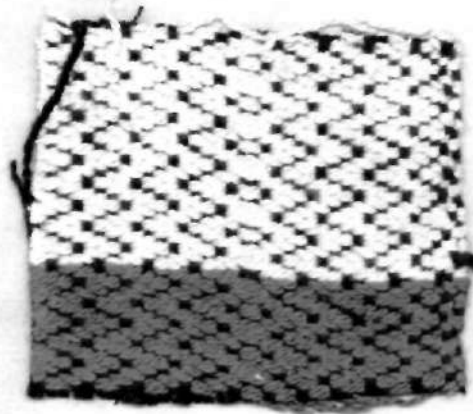
Warped Faced Weave 56 x 14 (16^S)

SWA: 070



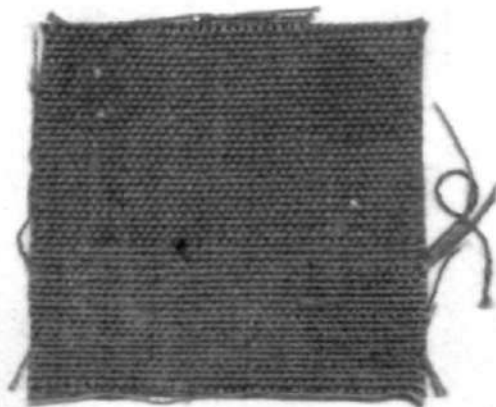
Patterned Weave

SWA: 071



Patterned Weave

SWA: 072



Plain Weave With Fine Yarns From The Industry
60 x 14 (24^s)

3.5.6. Science, Technology And Quality Control

This area is very important in the process of fabric production generally. The use of scientific procedure to conduct tests which ascertain and establish the quality of products is necessary for improved production processes. Also scientific measurements are used to achieve a better estimate of the quantity and quality required.

Comprehensive dye tests are conducted to ensure dye affinity to fabric. Appropriate finishing quality is determined. The technology in the industry, employs the use of mechanised gadgets to acquire good quality results. The operational staff detect and handle only minor faults on the machine during operation and more serious ones are handled by specialists.

In the academic institution, advanced technology is not usually put into practice. Some advanced technological know-how are introduced in the theory course while it is expected to be fully practicalised during industrial attachment training. The extent of textile science taught in the programme is not as may be required in the industry. Fabrics are purchased and used directly. Very often, measurements are estimated instead of using scientific devices.

3.6. Chapter Summary

This chapter describes the methods chosen and used for collection and processing of the information. It describes the population and sample used to provide the data for the study. The survey instruments used were described, they include the questionnaire, non participant observation and discussions, diagrams, pictures and some samples were also provided along-side with these in this chapter. Chapter IV will present the analysis of the data.

3.7. Footnotes

Borrough, GER (1975) Design Analysis in Educational research, Alden Press, Oxford.

Bruce, T.N. (1978), conducting educational research, 2nd Edition, Harcourt Brace Jovanovich Inc., New York.

Fiannu, S.K. (1985), "Sampling Procedures"
A research method lecture delivered to
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Faculty of Education, Ahmadu Bello
University, Zaria.

Kerlinger, F.N. (1973), Foundations of Behavioural research, New York University, Holt Rinehart and Winston, Inc.

CHAPTER IV

Presentation And Analyses of Data

- 4.1. Introduction
- 4.2. Analysis of responses to the questionnaire
- 4.3. Analysis of the non-participant observation
- 4.4. Summary of findings based on questionnaire responses
- 4.5. Summary of findings based on non participant observation.
- 4.6. Chapter Summary

4.1. INTRODUCTION

In analysing the information which relates to the extent of the relationship between the knowledge acquired by textile design graduates and skills expected of them in the industry, and the data collected from questionnaire and non-participant observation are used. The data collected from questionnaire are analysed using item analysis techniques in which each statement is treated separately. The data from the non-participant observation are analysed by comparing the items as they are observed in the industry and academic institution.

The analysis in this chapter seeks to find

the differences that exist between the academic institution and industry in their use of tools and equipment, procedure differences in products and why some graduates of textile design programme are not employed in the textile industries.

The first two tables are based on the questionnaire responses seeking general information about respondents. The remaining tables provide the organised form of the responses to state the information being sought from respondents in relation to one another. They also represent the extent of agreement and disagreement to statements on the questionnaire. The significant score rate in this study is 60% and above.

The observed similarities and differences on the activities of academic institution and industry are analysed by comparing items in the areas of design, transfer techniques, printing, dyeing, spinning, weaving as well as the effects of science, technology and quality control. The summary of findings resulting from the study are presented toward the end of this chapter.

4.2. Analysis To Responses To The Questionnaire

Table I
Status of Respondents

RESPONDENTS	NO OF QUESTIONNAIRE ADMINISTERED	NO OF RETURNS	% OF RETURNS
A.B.U. Staff	10	7	70
Students/ Graduates	30	15	50
Industry Staff	60	38	63.5
Total	100	60	60

The total number of questionnaire administered is 100 with a 60% returns. The information on sex of respondents in the questionnaire was to see if sex is a factor responsible for any difference observed.

Table 2
Sex Variable of Respondents

SEX	NUMBER	%
Males	46	77
Females	14	23
TOTAL	60	100

The female sex ~~was~~ found to be adequately represented in the academic institution. But they are not adequately represented in related jobs in the industry.

The few females found were non-graduates who could not respond to the questionnaire.

Table 3

Response to the question "Is textile design programme related to job required for weavers in the industry?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREE	%
A.B.U. Staff	6	4	67	1	16	1	16
Students/ Graduates	14	11	79	2	14	1	7
Industry Staff	35	28	80	4	11	3	9
TOTAL	55	43	78	7	13	5	9

All categories of the respondents report high percentage marks on the relevance of the weaving areas. So respondents perceived that there is no difference between skill acquired and that expected in the industry. However, a later observation reveals that because of the differences in the manipulations of the tools some differences are bound to occur.

Table 4

Response to the question "Does the textile design programme in the academic institution relate to the job requirements of the design department in the industry?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREED	%
A.B.U. Staff	6	6	100	0	0	0	0
Students/ Graduates	14	12	86	1	7	1	7
Industry Staff	33	30	91	2	6	1	3
TOTAL	53	48	90	3	6	2	4

The design skills acquired in the academic institution are significantly related to the job expected in designing in the industry.

Table 5

Response to the question "Is the programme in printing and dyeing adequate for the type of job requirement in this area in the industry?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREED	%
A.B.U. Staff	7	6	86	0	0	1	14
Students/ Graduates	15	12	80	0	0	3	20
Industry Staff	35	23	66	4	11	8	23
TOTAL	57	41	72	4	7	12	21

There is highly significant rate of agreement from respondents in the area of printing and dyeing.

Table 6

Response to the statement "Industry training outside the school is more relevant and beneficial to students career goals than those obtained within the programme"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREED	%
A.B.U. Staff	7	7	100	0	0	0	0
Students/ Graduates	15	15	100	0	0	0	0
Industry Staff	36	35	97	0	0	1	3
TOTAL	58	57	98	0	0	1	2

All the respondents except one, from the category of industry staff, agree to this statement.

Table 7

Response to the question "Does design in the industry differ from those in the academic institution?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREED	%
A.B.U Staff	7	6	86	0	0	1	14
Students/ Graduates	15	11	73	1	7	3	20
Industry Staff	36	21	58	4	11	11	31
TOTAL	58	38	66	5	9	15	26

Most respondents from the academic institution, highly agree with the statement while barely 58% of the industry staff agree to it. It was later found to be due to the unwillingness of some industry staff to accept the general assumption that industry design are mostly copied work.

Table 8

Response to the question "Does industrial training reduce the quality of students' creativity in designing?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREED	%
A.B.U. Staff	7	6	86	0	0	1	14
Students/ Graduates	15	12	80	1	7	2	13
Industry Staff	31	13	42	5	16	13	42
TOTAL	53	31	59	6	11	16	30

The respondents from the academic institution generally agree with the statement while those from the industry record a low percent of 42% against the statement with 5 people being uncertain. But on the whole 59% of the respondents agreed.

Table 9

Response to the question "should relevant research works from the academic institution be communicated to the industry?"

RESPONDENTS	N	AGREED	%	UNCERTAIN	%	DISAGREE	%
A.B.U. Staff	7	7	100	0	0	0	0
Students/ Graduates	14	14	100	0	0	0	0
Industry Staff	36	36	100	0	0	0	0
TOTAL	57	57	100	0	0	0	0

There was a 100% agreement to this statement by respondents.

Table 10

Response to the question "Are the following skills necessary for work in the textile industry?"

SKILLS	N	AGREED	%	UNCERTAIN	%	DISAGREE	%
Proficiency in drawing	57	46	81	6	11	5	9
Proficiency in painting	57	45	79	6	11	6	11
Arrangement and organisation of motif	57	54	95	0	0	3	5
Repeat of design	57	53	93	2	4	2	4
Practical function or out come of design	57	50	88	5	9	2	4
Relevance of design to Nigerian culture	57	39	68	13	23	5	9
Sound knowledge in the use of colour	57	52	91	0	0	5	9
Good work Finishing	57	48	84	5	9	4	7
Creativity and initiation	57	30	53	0	0	27	47
Public relations	57	49	86	6	11	2	4

It was agreed by most of the respondents that the skills identified are necessary for industry jobs. Arrangement of design had the highest agreement, of 95% and creativity and initiation with the least of 53%.

Table 11

Response to the question "Are these sections of the industry relevant to the experience of a textile design graduate?"

WORKING SECTIONS	N	AGREED	%	DISAGREED	%
Administrative	58	32	55	26	45
Spinning and Weaving	58	47	81	17	19
Design	58	57	98	1	2
Engraving	58	46	79	12	21
Printing and Dyeing	58	57	98	1	2
Real Wax	58	48	83	10	17
Sales	58	36	62	22	38
Testing Laboratory	58	26	45	32	55

The response displayed design, printing and dyeing to be most relevant followed by real wax, spinning and weaving, engraving as well as sales and Administrative sections. The testing laboratory was seen as not relevant to the experience of the textile design graduates.

Table 12

Response to the question "which units of the programme of the academic institution, are relevant to the needs of the industry"

PROGRAMME UNITS	N	AGREED	%	DISAGREED	%
Drawing	60	51	85	9	15
Design application and fashion design	60	50	83	10	17
Printed textile and decoration	60	60	100	0	0
Resist method	60	57	95	3	5
Textile organisation and management	60	59	98	1	2
Theory of colour	60	56	93	4	7
Weaving	60	56	93	4	7
Design and production	60	58	97	2	3

All the respondents agree with this statement. The responses in agreement are all very high ranging from 83% to 100%. The units of textile design programme in academic institution is relevant to the working needs of the industry.

4.3. Analysis of the non-participant observation

The pictures and illustrations provided in chapter III are utilised in this chapter for the analysis of the non-participant observation. The codes provided on them had earlier been explained in Chapter I. On designing, the pictures on pages 57 and 58, DEI: 001 and DEI: 002 from the industry are compared with those on pages 58 and 59, DEA: 001 and DEA: 002 from the academic institution. Realistic and floral representation of motifs are observed as being characteristic features of the

industry designs. Abstraction and use of geometric shapes are prominent techniques commonly used on designs from the academic institution. Paper designs from the industry are generally prepared for dress and furnishing as surface decoration while in the academic institution, structural paper designs for weaving were also produced.

The variety of designs from the industry includes designs for Real Wax, Java, Tetron, cotton, imitation george, super wax as shown on pages 60 to 62 as DEI: 003 to DEI 008 and DEI: 073. In the academic institution, imitation tie dye, Silk screen print dress or furnishing designs with colour sketches, real tie dye, imitation lace, batik, starch resist and weaving designs as DEA: 003 to DEA: 010 and DEA: 075 on pages 64 to 75. The differences observed in variation of design types are due only to extra reproduction facilities available in the industry.

It is possible then that students or graduates of the academic programme can adapt easily to working conditions of the design section in the industry. The tools, equipment and procedures involved in designing are similar.

In the area of transfer techniques for reproduction, differences are seen in the processes involved. These are mainly due to the

tools and equipment. Transfer of design in the industry involves copying the design on copper roller, rotary screen roller or wood block while in the academic institution it is copied unto flat silk screen, lino or wood block, paper stencil and by direct tracing on fabric.

The transfer in the industry is done by the use of chemicals and machine aids as panthograph and photographic exposure machines. This is as seen on pages 87 and 88 TEI: 021 and TEI: 022. The major parts of the processes in the industry are mechanised for ease, accuracy and speed while manual labour and handcrafted tools and equipment in the academic institution slow down reproduction.

In comparing tools and equipment used, more sophisticated ones were found in the industry. The various illustrations provided are some examples of the materials tools and equipment in the industry. They are on pages 82 to 88 , 94 to 104 as TEI: 013 to TEI: 027, TEI: 074. Others are SWI: 028, SWI: 031 to SWI: 034, SWI: 052 to SWI: 054 and SWI: 039 on pages 109 to 127 and 113 to 129. These are comparable to the manually operated tools and equipment from the academic institution shown on pages 72 to 73; 104 to 89 to 92 as TTA: 013 to TTA: 017, TTA: 029, TEA: 021

to TEA: 23, TEA: 027 to TEA: 029. Others are shown on pages 136 to 143 as SJA: 035 to SJA: 042

For the comparison of the area of printing and dyeing, different types of fabric produced were looked into in terms of methods and treatment of design, dyes and equipment used. The varieties of fabric samples used are Java, imitation wax, dyed cotton fabric and real wax. These are displayed on pages - 121 to 122 on PDI: 045 to PDI: 049 and compared with those of the academic institution on - pages 124 to 125 on PDA: 068 to PDA: 074 and PDA: 077. They are batik, starch resist, imitation tiedye, silk screen printed design and real tiedye sample,

The printed designs from the industry are observed to be more intricate with the use of many colours on Java and Tetron/cotton fabrics. The dyes used in printing penetrate and spread more evenly over the fabric than the academic institutions printing dyes. The dye affinity or fixation to fabric are also more reliable in industry than academic institution.

The types of dyes found in the industry include vat, discharge, reactive and rhemazol used for printing and dyeing while vat, azoic and prepared pigment dyes were found in the academic institution. The constraint of the

academic institution in the use of other various dyes are its accessibility, appropriate mixing, auxiliaries and adequate fixing facilities.

Fabric production in the industry is in a continuous range, moving from one stage to another in controlled and accelerated speed, among various rollers. In the academic institution, the movement of fabric involves many hands and manually operated equipment. Spinning is only practicalised in the industry while only theory knowledge of it is acquired in the academic institution.

Interlacing of weft and warp yarns under tension is weaving. In the industry, plain and pattern weaves are produced for clothing. Likewise in the academic institution, plain and patterned weaves are also produced for clothing, furnishing and in addition off-loom weaving, such as tapestry weaves as well as wall hangings and rug weaving are mostly embarked upon.

The woven samples from the two establishments compared are as on pages 130 to 131 on SWI: 055, SWI: 068 to SWI: 071 and SWA: 055, SWA: 068 to SWA: 072 on pages 134 to 135. Differences observed are that the weaves from the industry are lighter than those from the academic institution. The yarn count of the industry

yarns are higher, thereby having fine yarns and used on very fine reed dents which result into the light weaving. The looms used for the production of these weaves are motorised in the industry and non-motorised in the academic institution.

Science, technology and quality control are involved in varying degrees in any form of reproduction be it contemporary, traditional or mechanised. This aspects are utilised according to the sophistication of the systems used. The knowledge of science is required for mixing dyes, measurement, reactions of dyes, pretreatment of fabric and so on, be it in the industry or academic institution. That of technology are necessary in the manipulation of the various equipment used and quality control is required for reliability and consistent reproduction. These were found to be in varying degrees in the academic institution and industry with the industry abiding more by them.

4.4. Summary of Findings Based on Questionnaire

From the analysis of the questionnaire responses the following results and findings emerge from the study.

It was found that most of the respondents

4.5. Summary of Findings Based on the Non-Participant Observation

ACADEMIC INSTITUTION	INDUSTRY	FINDINGS	COMMENTS
Designing:- For surface and structure of fabric	For the surface of fabric only	Related	No difference
<u>Transfer Techniques:</u> Manual and handcrafted methods used	Chemical and mechanised	Processes tools materials and equipment differ	Great difference observed.
<u>Tools And Equipment:</u> Slow and manually operated, involving simple technology.	Mechanised fast and power driven equipment with complex technology	Graduates of textile design need special training to use industry equipment	Great difference observed
<u>Printing And Dyeing:</u> Manual production from pretreatment to finishing on limited facilities	Mechanised production with a variety of alternative processes to use	Differences exist in materials involved quality and quantity	Great difference observed
<u>Spinning And Weaving:</u> No spinning production and weaving on non-motorised looms and off loom.	Spinning and weaving on motorised looms	Faster Weaving in the industry with light weight	Some differences observed
<u>Science And Technology:</u> Low involvement and the use of simple technology	Intense uses of science in testing laboratory and technology in mechanised equipment	The academic programme does not measure up with industry in this area	Some difference observed

Furthermore, it was found that graduate designers are not given adequate recognition in the industry. This is associated with the way the industry utilises low income trained designers in the copying of designs from foreign produced wrapper as requested by dealers.

It was found that the very few textile design graduates employed in the textile industries were employed based on the people they know, by chance and the need for indigenes of the state they come from at times.

It is also found that the allocation of students on industrial attachment is by concentrating students in design section of the industry; this area is not too distinct from the experiences gained from their institution.

From the academic institution it was found that certain courses in the programme are given different titles on the time-table from the syllabus and this sometimes affect the implementations of the course.

It is found that the academic institutional programme of textile design, put more emphasis on the teaching of hand crafted skill and processes due to the extent and sophistication of tools and equipment available.

4.6. General Summary

This chapter contains the presentation of analyses and summary of findings resulting from the data collected in the study. The presentation and analyses of the study are divided into two areas as analysis of responses to questionnaire and analysis to the non-participant observation. The findings are also divided into the two areas of analyses. Summary of the whole study, conclusions and recommendations based on the study and for future research are provided in chapter V.

CHAPTER V

Summary of Findings, Conclusions, Implications And Recommendations

- 5.1. Introduction
- 5.2. Summary of Findings
- 5.3. Conclusions
- 5.4. Implications
- 5.5. Recommendations
- 5.6. General Summary

5.1. INTRODUCTION

This chapter provides a synopsis of the study in terms of problems, objectives, methodology and procedures used. Based on these, findings, implications, conclusions and recommendations are given for the use of textile design programme developers, Industry and future researchers.

5.2. Summary of Findings

Based on the data collected analyses, findings deduced from questionnaire responses and non-participant observation outlined in chapter IV, the following emerge as summary of findings:

1. Textile design programme and industry are highly related in terms of use and functions of design.

2. Textile design programme of the academic institution does not prepare students adequately for testing laboratory and spinning sections of the industry.
3. There are differences in tools and equipment used by the academic institution and industry in the area of design transfer and reproduction.
4. There is not enough interaction between the industry and academic institution as regard cooperation for the improvement of textile trade.
5. Some of the reasons for non-employment of graduates in the textile industry include the differences that exist in the kind of training the students acquired through more emphasis laid in the use of handcrafted tools and equipment which differs from the use of mechanised ones found in the industry.
6. Recent innovations in the textile design programme in the academic institution are still not adequately reflected in the syllabus circulated.

7. The Academic institution's textile design programme does not adequately represent the interest of students, lecturers and employers.
8. The placement of textile design students on industrial attachment, in only the design section of the industry does not provide them with adequate experience. For instance use of mechanised tools and equipment, Engraving, Weaving, Printing and Dyeing.

5.3. Conclusions

In view of the findings these conclusions are drawn:

1. There are many more graduates unemployed by the industry than those employed.
2. Textile design programme of the academic institution does not prepare graduates for jobs in the spinning and testing laboratory sections of the industry.
3. Differences in the use of tools and equipment for design transfer and reproduction affect the preparation of students for jobs in the Engraving, Printing, Dyeing and Weaving areas of the industry.
4. Research works produced in the academic institution are inadequately utilised in the industry due to little interaction existing

with the industry.

5. Textile design programme in the academic institution adequately prepares graduates for job in the design area of the industry.
6. Planning and implementation of textile design programmes are still inadequate.
7. Students on industrial attachment are improperly placed in working areas of the industry.

5.4. Implications

Based on the findings and conclusions of this study, the followings are implied:

1. That if textile design training in academic institution is to feed the industry with its trainees, then there is need for re-organisation.
2. That if the current programme can create employment for handcrafted technology, then a clear cut direction should be followed.
3. That the differences that exist between the two institutions require immediate attention.

5.5. Recommendations

On the basis of the findings and conclusions in this study, recommendations are

made for the industry, academic institution and future research.

Industry And Academic Institution

1. In order to take up the challenges brought about by the industrialising society as well as solving the unemployment problem facing the country, Industries should interact adequately with academic institution in the planning and implementation of their programme. Conversely, Institutions should involve industry representation in developing and implementing the programmes.
2. The industry should train and accept students and researchers into all relevant areas of the industry during the industrial attachment.
3. The industry should sponsor certain programmes in the academic institution to foster the existing relationship.
4. The period of student industrial training for adequate experience in the various areas of the industry is not enough. Also the textile design programme specialisation should be increased to four years so that industrial training can be increased from 3 months to 1 year and divided into two sessions. The first half after the second year and the second half after the third year.

5. The academic institution should acquire some industrial tools and equipment for teaching and also supplement those not available by showing slides or films of their use.
6. A review of the textile design programme is necessary to incorporate the implementation of mechanised processes with the handcrafted skills.

Future Research

1. Use an alternative population and research methodology and find the relationships or differences in the study.
2. Data in the study could be used ~~but~~ ^{to} for students of Polytechnic to replace those in University.
3. Compare products of handcrafted industry with those of mechanised type to see whether in fact there is a need to go on complete mechanisation.
4. This study could be conducted using other areas of industrial design programme like Ceramics, Graphics as well as Glass Technology and design in order to see if similar findings are got.

5.6. General Summary

The main problem behind the study was the problem of unemployment of graduates of textile design in the textile industries. The aim of this study therefore ^{was} ~~to~~ to look into what is existing in the industry and examine the extent to which textile design programme in academic institution meets their needs.

The population of textile industry in Northern Nigeria and A.B.U. textile design programme were used with a selected sample of 100 whom questionnaire was administered on. Non-participant observation was also utilised to collect information which resulted into the findings, conclusions, implications and recommendations provided in this chapter.

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Questionnaire:

General Information:

1. Sex: Male Female
2. Status:
 - (i) A.B.U. Staff
 - (ii) IndustryStaff
 - (iii) Graduate of A.B.U.
Textile Design Programme
 - (iv) Student of A.B.U.
Textile Design
Programme.
3. If a student or graduate, state your year of graduation or present class
4. If a staff, state how long you have been in this service, your place of work and category

Instructions:

Mark on the line to the left of each statement the extent of your agreement or disagreement. Please mark every items writing either of the letters A. through E depending on your feelings in each case. Use of personal value judgement will be required were sample is provided.

- A Strongly agree
- B Agree
- C Uncertain
- D Disagree
- E Strongly Disagree

5. The following papers make up the course units of the textile design programme in A.B.U. indicate by thicking any unit or units which does not seem relevant to the needs of the industry.

_____	Drawing
_____	Design and Production
_____	Design Application and Fashion Design
_____	Printed textile and decoration
_____	Resist Methods
_____	Textile organisation and management (theory of textile).
_____	Theory of Colour
_____	Weaving

6. The following section constitutes some of the working section or department in the textile industry. Indicate by a tick, the areas not relevant to the experience of an A.B.U. textile design graduate.

_____ Administration
_____ Spinning and Weaving
_____ Design
_____ Engraving
_____ Printing and dyeing
_____ Real Wax
_____ Sales
_____ Testing Laboratory

7. _____ A.B.U. textile design programme relates skills required in the area of weaving to the weaving department of the industry.
8. _____ Textile design programme in the area of design relates to the job expectations of the design section of the textile industry.
9. _____ In the area of design transfer, A.B.U. textile design programme match the job expectations required in the engraving sections of the textile industry.
10. _____ A.B.U. textile design programme provides students with relevant experience, necessary to work in the printing and dyeing section of the industry.
11. _____ The experience of textile design graduate of A.B.U. can enable them work in the laboratory department of the textile industry.

12. _____ The content of the textile design programme in A.B.U. is adequate to the skills needed in industry jobs.
13. _____ Industrial Training Scheme outside the school are most beneficial and relevant to most students career goals.
14. _____ Designs produced in the industries are usually different from those from the academic institutions.
15. _____ Designs in the industry are generally copied works and not very original.
16. _____ The basics of design practice are the same for the industry and institution.
17. _____ Industrial training confines students to some specific rules which narrows down the extent of creativity in designing.
18. _____ In planning and executing a fabric design, one goes through sketching designing, colour separation, transfer and printing or dyeing in both the industry and institution.
19. _____ The design department has some professional relevance to skills acquired by graduates of textile design programme in A.B.U.
20. The following are identified as some skills to be acquired for industry job as a designer.
 - _____ Proficiency in drawing
 - _____ Precision in painting
 - _____ Arrangement and organisation of motif.
 - _____ Repeat of designs.

- _____ Practical function or outcome of design.
- _____ Relevance of design to Nigerian culture.
- _____ Sound knowledge in use of colour.
- _____ Good work finishing
- _____ Creativity and initiation
- _____ Public relations
- 21. _____ The sales department in the industry requires the services of the textile designer in the evaluation of consumer needs, advertising, display and market research.
- 22. _____ Results of students relevant research works to the industry should be communicated to the industry.

APPENDIX B

TABLE OF JOB PLACEMENT OF GRADUATES FROM 1980 - 1985

YEAR OF GRADUATION	ADMITTED FOR INDUSTRIAL DESIGN	SPECIALISED IN TEXTILE DESIGN	% OF THOSE WHO SPECIALISED	INFORMATION NOT AVAILABLE	INFORMATION AVAILABLE	TEACHING	WORKING IN TEXTILE INDUSTRY	GRAPHICS/ART PRINTED AREAS	DESIGNERS OR PRIVATE PRACTITIONERS	OTHERS
1980	30	9	30	-	9	5	-	1	1	2
1981	22	8	36	2	6	3	2	1	-	-
1982	31	11	35	2	9	4	-	5	-	-
1983	43	15	38	5	10	3	2	3	1	1
1984	40	11	28	0	11	8	-	1	1	1
*1985	45	11	24	2	8	-	4	1	3	-
TOTAL	215	65	30%	12	53	23	8	12	6	4

*As at the time information was collected specialising students for 1985 were still under graduate so their job placements is on what they intend to do on graduation.

F.ID/83/86

2nd May, 1986.

The Personnel Manager,
United Nigeria Textile Limited,
Kaduna.

Dear Sir,

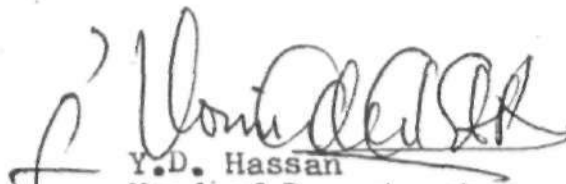
ADAMU J.M. - POSTGRADUATE STUDENT

The above is a Postgraduate student who is presently conducting a research into graduate job expectations in the industry in comparison to Ahmadu Bello University Textile Design Programme Zaria.

I would be grateful if she could be granted permission and necessary assistance to administer her questionnaires in your mill.

Thanks for your cooperation.

Yours faithfully,


Y.D. Hassan
Head of Department.

F.ID/83/86

2nd May, 1986.

The Administrative Manager,
Kano Textile Mills Nigeria Limited,
Kano.

Dear Sir,

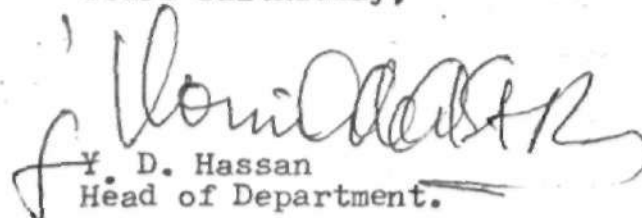
ADAMU J.M. - POSTGRADUATE STUDENT

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Yours faithfully,


Y. D. Hassan
Head of Department.