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LEATHER RESEARCH AND TRAINING INSTITUTE,
DU/TUR/74/007.
TURKEY.

Technical report: Design and manufacture of leather
and fur garments

Prepared for the Government of Turkey by the
United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Carlo Palizzotto, expert in the design
and manufacture of leather and fur garments

United Nations Industrial Development Organization
Vienna

id. 78-2590

Explanatory notes

A comma (,) is used to distinguish thousands and millions.

A full stop (.) is used to indicate decimals.

References to dollars (\$) are to United States dollars, unless otherwise stated.

The monetary unit in Turkey is the lira (LT). During the period covered by the report, the value of the lira in relation to the United States dollar was \$US 1 = 19.25.

LRTI refers to the Leather Research and Training Institute.

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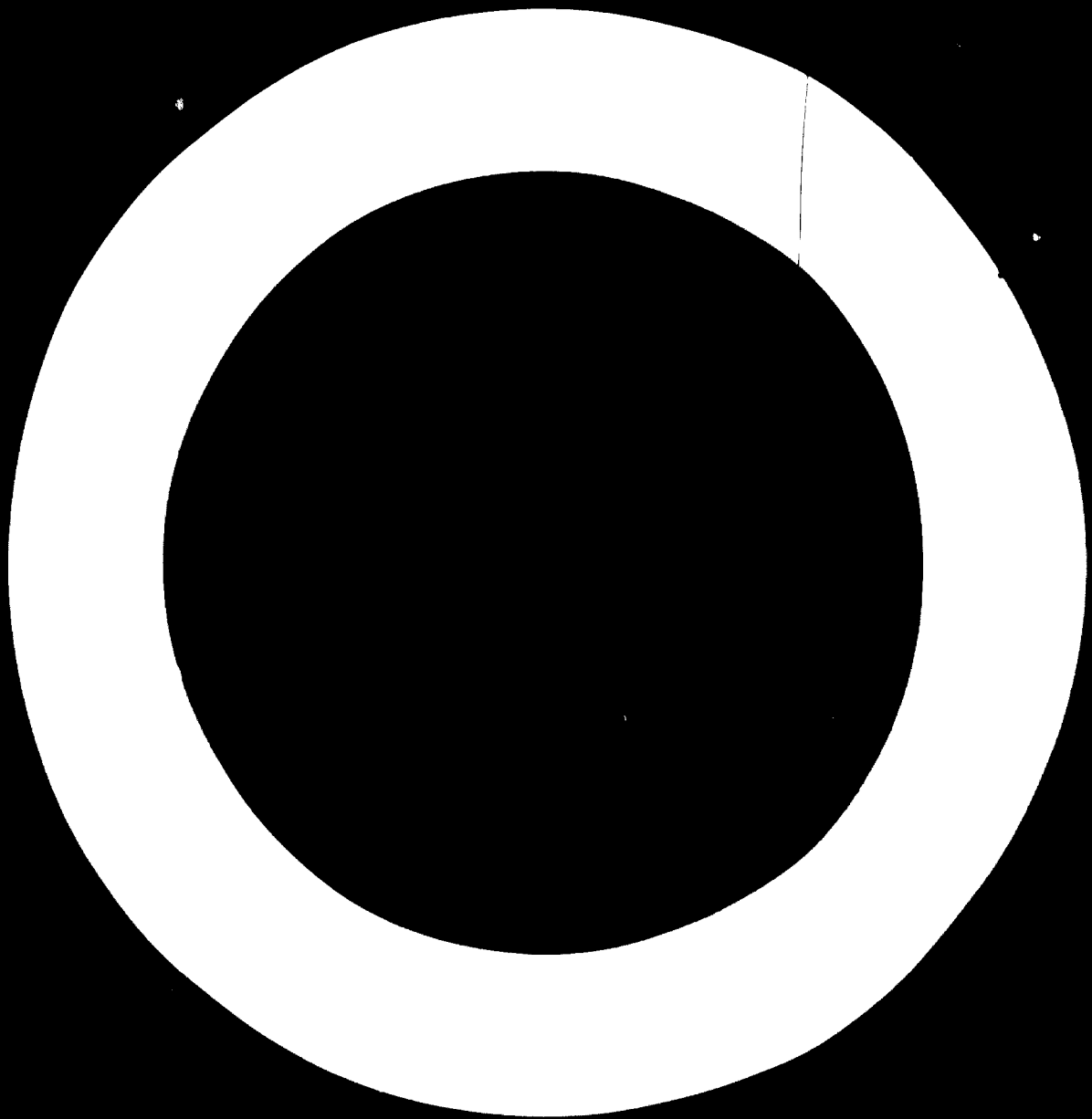
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ABSTRACT

The project entitled "Leather Research and Training Institute" (DU/TUR/74/007) arose from a request made by the Government of Turkey in November 1969 for the assistance of the United Nations Development Programme (UNDP) in the development of the leather and fur industry in Turkey. Following approval of the request, the first phase of the project began in 1970, with the Food and Agriculture Organization of the United Nations (FAO) designated as executing agency, and the Ministry of Agriculture of Turkey as government co-operating agency. Phase II of the project started in 1974, with the United Nations Industrial Development Organization (UNIDO) serving as an associated agency. The two-month mission covered by the present report began in January 1978.

One of the main conclusions of the report is that while garment manufacturers in Turkey currently have access to plentiful supplies of quality leathers for their products, thanks to the concerted national and international action to promote the leather and fur industry, they are unable to take full advantage of their raw material because the garment industry lacks large modern plants and suitable organization, layout, planning, quality control, methodology, manufacturing techniques and designs.

To help the leather and fur garment industry overcome its current problems, the report recommends, among other things, that a Special Service Department should be set up within the Leather Research and Training Institute (LRTI), one section of which should be devoted to assisting the industry with management, organization, manufacturing, design and fashion information.



CONTENTS

| <u>Chapter</u> | <u>Page</u> |
|---|-------------|
| I. INTRODUCTION..... | 6 |
| II. PROJECT ACTIVITIES..... | 8 |
| III. FINDINGS..... | 9 |
| A. Leather and fur garment section at LRTI..... | 9 |
| B. De-su-ko Co-operative..... | 10 |
| C. Design School..... | 11 |
| IV. RECOMMENDATIONS..... | 12 |

Annexes

| | |
|--|----|
| I. Extension service programme..... | 13 |
| II. Technical demonstrations of leather garment production processes..... | 14 |
| III. Education and training in leather garment-making (nappa and suede)..... | 15 |
| A. Course of specialization..... | 15 |
| B. Vocational training course..... | 16 |
| IV. Recommended equipment list for a training confection department at LRTI..... | 19 |

I. INTRODUCTION

In response to a request initially made in November 1969, the United Nations Development Programme (UNDP) has provided assistance in the implementation of the project entitled "Leather Research and Training Institute" (DU/TUR/74/007), the purpose of which is to promote further development of the leather and fur industry in Turkey. The executing agency for the project is the Food and Agriculture Organization of the United Nations, with the United Nations Industrial Development Organization (UNIDO) as an associated organization, and the Ministry of Agriculture of Turkey as the government co-operating agency. The Leather Research and Training Institute (LRTI) is located at Pendik, near Istanbul. It is assisting the leather and fur industry of the country within the framework of the above-mentioned project. As a result of the project and the activities of the LRTI, the leather and fur industry in Turkey has been greatly developed, improving the living standard of the people.

The leather and allied industries are an important part of the Turkish economy, particularly in the export field, where a significant rate of growth has occurred over the last few years. In 1972 the country earned \$24 million from leather and skins export, \$15 million from indirect export of tourist goods, and \$40 million from leather garments export.

In 1975 the country earned \$64 million from direct export of leather garments, and indirect exports in the form of sales to tourists represented approximately \$45 million. It is expected that in 1976 direct export will drop to about \$40 million. The highest figure was recorded in 1974, amounting to \$72 million.

No other manufacturing industry in Turkey claims such a high export potential. Thus in 1976 export earnings from cotton and textiles was \$49 million, chemical products \$44 million, vehicles \$9 million, and metals \$4 million.

The leather and fur garments industry, which began as a cottage industry, has been transformed into small units employing about 50,000 workers, but there are many workless people who, if trained, would form a significant source of additional manpower. Today there is one large integrated garment-producing unit in Izmir and three others in Istanbul, but these usually operate by using outworkers for assembling purposes on a piece-rate basis. The bulk of the production is done in small privately-owned ateliers, which are often ill-equipped and undermanned.

Sheep leather in Turkey is excellent, and this has been achieved as a result of the hard work done under the project and by the LRTI in the tannery field. In Istanbul there is a State Design School which is training additional technicians for the industry, but only for women's clothing and, above all, traditional embroidered costumes.

In order to assist the Government of Turkey in the improvement of the organization and operations of the LRTI for the promotion of the leather and fur industries, UNIDO assigned the expert to the two-month mission, beginning on 16 January 1978, covered by this report. The duties of the expert were as follows:

- (a) To assist selected enterprises in the production and techniques used in the manufacturing of leather and fur garments;
- (b) To conduct short-term courses on the design and manufacture of leather and fur garments at the LRTI and the State Design School in Istanbul;
- (c) To prepare a programme for extension services, demonstrations and formal training courses aimed at improving the quality of leather and fur garment articles;
- (d) To advise the garment industry on technical improvements in processing, plant development etc. with the aim of improving methods of construction and design of nappa and suede clothing, as well as ensuring the proper utilization of furs and leather for garments.

II. PROJECT ACTIVITIES

The expert's programme of activities was prepared by the LRTI management and was mostly devoted to assisting the Design School of Istanbul.

Technical lectures were given at the Design School on the scientific design of basic industrial patterns to be incorporated in its vocational training course. The head of the Design School chose 12 of the School's original high-fashion sketches. Following the drawings, paper patterns were developed, and also muslin prototypes which were fitted and stylized on three different professional models. The intention was to put together a high-fashion leather garment collection for a planned Design School exhibition, but it was not possible to carry out this ambitious plan for lack of special leather and machines.

The garments were to be made in the LRTI's leather garment section, which has only one machine suitable for leather garments, so that it would have taken a good deal of time to do the 12 planned garments. However, at least two of the garments were made by the technicians working in the section, and the others will be made afterwards in the Design School by the students as part of their training programme.

Technical lectures were given to technicians and craftsmen from the De-su-ko Co-operative. The expert provided some brochures on leather and double-face fashion from internationally known factories, and models were developed by the expert at the De-su-ko Co-operative workshop. Copies of the brochures were made by other factories and the Design School.

The managers of LRTI attended demonstrations given by the expert on developing patterns. Visits were paid to workshops of the De-su-ko Co-operative, where the expert was able to give technical advice on production processes and on correcting patterns. Various other establishments were visited, and the expert spent some time advising technicians on technical problems and suggesting improvements in production processes.

Three days were spent at LRTI to draw up programmes for action along the following lines: extension services; demonstrations of production processes; course of specialization in new production processes; vocational training courses.

The above-listed programmes are included in annexes I to III of the present report, and annex IV contains a recommended equipment list. Finally, three days were devoted to the preparation of the final report.

III. FINDINGS

A. Leather and fur garment section at LRTI

The leather and fur garment section of LRTI has remained unchanged over the past year. Its equipment consists of one leather machine, two tailor's dummies, one large cutting table, one small ironing table and one household iron. There are also two fur machines that are only suitable for fur garments. This small section is mostly devoted to making leather and fur garments to measure. This type of activity suggests that the leather garment department is not considered important, and is at the moment a sideline.

Three technicians are on the staff in addition to the head of the section, who has been trained at the Design School in Istanbul, and who may need more experience before assuming responsibility for a new department handling industrial programmes for the country's leather and fur garment industry. During a previous mission the expert demonstrated a new leather garment production process which the technicians have been applying. They are sufficiently skilled in their work and could be given the responsibility of conducting demonstrations of leather garment production processes. They are also able to prepare new leather garment prototypes, to study production processes and to supply both to craftsmen. The LRTI tannery department has adequate rooms and suitable equipment, and in the manufacturing department the shoe and leather goods sections are large-sized and sufficiently equipped, while the leather and fur garment section is relegated to a corner in the leather goods section. Until recently it was managed by the chief of the leather goods department, who was unfamiliar with leather and fur garments technology. This situation reflects the lack of a strong interest by LRTI in leather and fur garment industrial activities.

As recommended by the expert in his report on a mission carried out a year earlier, on establishing the manufacturing department, which includes shoe, leather goods and leather garment sections, each section should be separate and have its own chief, rooms and equipment. This recommendation has not, however, been carried out.

The promotion of the leather and fur industry by LRTI, with FAO assistance, has led to the substantial growth of this industrial sector. Consequently, the manufacturers now have plentiful supplies of good-quality raw material. But if there is a good supply of quality leathers for garments, the garment industry lacks large modern plants and suitable organisation, layout, planning, quality control, methodology, manufacturing techniques and designs. Moreover, the expert

has found that the LRTI at present has no special department to give training in the above-mentioned specialized fields for the leather and fur garments industry.

B. De-su-ko Co-operative

The expert was told that the De-su-ko Co-operative now has about 45 leather and fur garment members. This co-operative society has a show-room where a part of its production is sold, and a work-room has also been opened near the show-room. In starting this work-room it was planned to expand it in a short time to a big factory.

During his earlier mission the expert gave technical lectures and suggestions on production processes and patterns correction. Since that time production has been substantially improved. However, as more suitable new machines, such as special feeders, have not yet been obtained, some seams and top stitchings are imperfect. A production process demonstrated by the expert the previous year is applied involving the use of as little cement (glue) as possible, reinforcing where necessary by attaching fusing interlining; but owing to the lack of a suitable fusing press machine, the result could not be much improved. The value of production therefore declines.

Another factor that downgrades production, and not only the production of the De-su-ko Co-operative, but all the leather and double-face garment production in the country, is the deeply-rooted custom of making the bottom part facing from small pieces, thus using from three to four joining seams. This facing part is that which goes from the uppermost button down along the inner part of the garment front edge. The profit derived from saving raw material is less than the loss suffered from the lower value of the garment. The expert made suggestions as to how this problem could be avoided, thereby cutting profit losses (see chapter IV of this report).

The double-face garments made by a member of the co-operative society are now very good in terms of both style and manufacture, and could compete on the international market. The craftsman declared himself satisfied because on improving his process of production he obtained better quality, saving on raw material and processing time.

C. Design School

On visiting the State Design School in Istanbul the expert was shown a new teaching method for vocational training courses designed on the basis of suggestions made by the expert during his previous year's mission. A request was made for further technical lectures in order to broaden the Design School's vocational training programme.

Some high-fashion muslin patterns developed by students of the vocational training course were displayed. The patterns were based on the new technologies described during the technical lectures of the previous year.

The students are now beginning the second year of their programme, and have no experience in leather garment technology. The School has planned to give them training in leather garment design and manufacture.

During his visit to the Design School, the expert found four unused sewing machines suitable for light leather (nappa and suede).

IV. RECOMMENDATIONS

1. LRTI management should allow the use of project assistance in preparing programmes for future expert missions, in order to avoid non-feasible activities such as courses requiring equipment that is not available.
2. Host-country staff speaking the visiting expert's language should be made available in future.
3. A functional leather and fur garment section or department should be established, ending the present made-to-measure tailoring work done in the section, and giving it a qualified management.
4. The new section, or department, should be devoted to the production of fashionable prototypes, the study of their processes of production, and the supply of both to manufacturers.
5. A special service programme for the leather and fur garment industry should be started as soon as possible, with technical demonstrations, courses of specialization and courses of vocational training as recommended by the expert in this report.
6. A special service department should be set up, one section of which should be devoted to assisting the leather and fur garment industry with management, organization, manufacturing, design and information on fashion.
7. Leather garment makers should be encouraged to stop making inner garment facings from small pieces as is the current practice (only one joining should be done).
8. Manufacturers should be advised to start making special handbags in order to utilize small pieces of leather properly. This recommendation could easily be implemented at the co-operative workshop, small pieces being collected from associated makers; the leather goods section of LRTI could advise on models and production processes.
9. The points raised in the expert's report on his previous year's mission, which emphasized assistance to the leather and fur garment industry, should be given fresh consideration. In addition, a study of the present condition of equipment in this industry should be prepared and the Government requested to establish on its behalf adequate laws allowing manufacturers to obtain the required machinery.

Annex I

EXTENSION SERVICE PROGRAMME

The Turkish leather garment industry has undertaken a programme designed to increase the export of its products. To obtain the best result in this export drive, it needs help to overcome certain problems. The following matters are those most urgently in need of attention:

Obtaining advance information and guidance on international fashion trends in order to adapt production to future fashion styles

Acquiring know-how on advanced production processes and arranging for their assimilation without disrupting normal production

Recruitment and training of workers and technicians in specialized areas.

The following action would contribute to the solution of the above-mentioned problems:

Making the LRTI's small leather garment section a properly-equipped independent department with a highly-skilled management responsible for creating fashion prototypes, studying appropriate production processes and supplying both prototypes and processes to manufacturers

Establishing a fashion information service to assist manufacturers, arranging demonstrations on new and advanced production processes, and advising on suitable machines to improve production

Planning and conducting courses of specialization for current workers and technicians and vocational training courses for the newly recruited.

Annex II

TECHNICAL DEMONSTRATIONS OF LEATHER GARMENT PRODUCTION PROCESSES

The object of technical demonstrations of leather garment production processes would be to give those who are concerned with new and advanced processes of production the opportunity to become acquainted with the latest technology in this field; and to demonstrate the technologies applied by makers in countries with substantial leather garment exports. The demonstrations would be open to industrial manufacturers and craftsmen, managers, technicians and workers, who are active in the leather garment industry.

For those from outside who come daily and wish to have complete demonstrations, the programme would cover three days, from 1000 h to 1200 h and from 1300 h to 1600 h, or a total of 15 hours. For those with accommodation in the LRTI hostel who wish to have complete demonstrations, the programme would cover two days, from 0900 h to 1200 h and from 1300 h to 1700 h, or a total of 14 hours.

The methodology of the demonstrations would be as follows. Two lined leather jackets, one for women, one for men, will be made. Cutting will be done by knife, using standard patterns previously prepared on millboard. The making will be carried through from cutting to pressing and sewing on the buttons. The demonstration will be conducted only by LRTI technicians; those who might be interested in making their own experiments should take a suitable course.

The main stages of the demonstrations are indicated below.

- Cutting the leather (done by knife)
- Cutting the lining and reinforcing fusing interlining
- Attaching the reinforcing fusing interlining by special fusing-press
- Preparing the garment to set the lining
- Preparing the lining with assembled sleeves and shoulder pads, and sewing the latter by machine along the lining armhole
- Assembling the lining to the garment by the inside
- Assembling the lining along the garment armhole (this operation, almost unknown in Turkey, is very important, because if it is not done, when the garment is worn, the lining, being loose, runs down the sleeve and hangs out of the cuff)
- Turning the garment right-side out
- Pressing by a suitable pressing machine
- Sewing on the button by hand

Annex III

EDUCATION AND TRAINING IN LEATHER GARMENT-MAKING (NAPPA AND SUEDE)

A. Course of specialization

The purpose of the course is to give those attending, both male and female, specialized knowledge of new technologies applied by manufacturers in countries with substantial leather garment exports. Admission would be limited to technical managers, foreman and workers, of whom must be able to make a garment by themselves, otherwise they would need a vocational training course. The minimum age for admission would be 18, and the length of the course would be 10 working days, from 0900 h to 1200 h and from 1300 h to 1700 h, or a total of 70 hours.

The methodology of the course would be as follows. During the course 10 leather garments (nappa and suede) will be made, four for men, three for women and three for children, each garment being in a different style. The course is devoted only to making, so that the cutting operation will be left out. Cutting of garments will be carried out by LRTI's technicians. The patterns will be standard and previously prepared from millboard. The garments will be made from the first step after the cutting to pressing and sewing on the buttons.

The main steps in the garment-making process are outlined below.

Final operation:

- Attaching the fusing interlining on parts which needed to be reinforced by a special fusing-press
- Making of patch pockets
- Sewing of darts and yokes and top-stitching
- Setting of patch-pockets, or making up flap-piping pockets
- Making piping (welt) buttonhole
- Placing stay-tape along the front-jacket outer edge
- Preparing of back part (central seam, yoke, vent, and top-stitching)
- Joining side seams, shoulder seams and top-stitching
- Attaching the facing to the garment sewing along the front edge and to the back neck part
- Trimming the excess front facing along the gorge line and the back neck line
- Joining the upper collar along the gorge and back neck lines, front facing side
- Joining the under collar along the gorge and back neck lines, jacket side
- Assembling the under to the upper collar, stitching around the under collar outer edge, after which the excess upper collar will be trimmed along the under collar allowance line

Opening the under and upper collar seams with cement, then hammering on
Second operation

Cementing along the outer jacket from edge, lapel and collar (along the hem line it will be done in such a way as to leave 2 cm loose along the outer edge hem allowance to let the sewing machine pass over to the next steps)

Turning, folding and hammering all around the front facing, collar and hem allowance

Preparing the sleeves, folding and cementing the hem allowance

Attaching the sleeves, stitching around the armholes

Top-stitching around the front, lapel and collar jacket

Preparing the lining, sewing it on a safety-overlock machine (sides, centre back, shoulders, armholes and inner sleeve seams), attaching inner pockets and shoulder pads, and assembling the pads along the shoulder seam allowances and the lining armhole-seam allowances

Assembling the lining to the garment, stitching along the pocket hem allowance, facing and the sleeve hem allowances

Assembling both seam allowances along the joining between the jacket to under collar and the facing to upper collar

Assembling both lining and garment armhole seam allowances, stitching them together, garment side up and inserting a sleeve head

Turning the jacket right side out through an opening along a sleeve lining inner seam

Cleaning

Pressing by a pressing machine

Final pressing by a heavy iron

Final pressing of the lining by light iron

Sewing on the buttons

B. Vocational training course

The object of the programme is to prepare trained and qualified workers for the leather garment industry, especially among the rising generation. The course would be open to sewing machine and preparing operators from 18 to 25 years of age with at least an elementary school certificate. It would last three months, or a total of 55 working days, four to five days a week, from 0900 h to 1200 h and from 1300 h to 1700 h each day. Cutting operations would be omitted from the course and 15 leather garments (nappa and suede) would be made, five for men, five for women and five for children.

The contents of the course are outlined below.

Nappa and suede, their reaction to different production processes and special characteristics

Description of various tanning processes, sewing machines, special leather machines and cements used for preparing assembly parts

Training in the use of leather garment sewing machines and in assembling-handling

Making piping (welt) buttonholes, patch pockets, flaps, collars, cuffs, openings and vents (flap-pockets, inner pockets) and setting zips

Preparing folded edges, cement and hammer handling

Assembling linings

Reinforcing the parts where reinforcement is needed, attaching fusing interlining by a special fusing machine

Reinforcing small parts, attaching muslin with cement

Making garment of simple construction

Making garment of fairly complicated construction

Making garment of highly complicated construction

Elements of anatomy

Observations on the history of costume

Fashion in leather garments (nappa)

Fashion in suede garments

Organization of the course

| <u>Day</u> | <u>Time spent (hours)</u> | <u>Activity</u> |
|------------|---------------------------|---|
| 1 | 3 | Formal opening of course |
| | 4 | Nappa and suede, technical characteristics; description of different tannery processes |
| 2 | 2 | Demonstration of cements used for preparing assembly parts |
| | 5 | Sewing machines and special leather garments machines (training) |
| 3 | 7 | Training in preliminary assembling operations |
| 4 | 7 | Training in preliminary assembling operations |
| 5 | 7 | Making piping buttonholes and piping pockets |
| 6 | 7 | Making flaps, cuffs and openings in various ways |
| 7 | 7 | Making collars and inner pockets and setting zips |
| 8 | 7 | Making in mixed operations the workpiece prepared on days five, six and seven |
| 9 | 7 | Cementing and hammering, preparing operations for patch-pockets, flaps, collars, cuffs, borders and vents |
| 10 | 7 | Cementing and hammering, preparing operations for patch-pockets, flaps, collars, borders and vents |
| 11 | 7 | Assembly operations on lining and setting inner pockets, label and size number |
| 13 | 7 | Reinforcing small garment parts using muslin and cement |

| <u>Day</u> | <u>Time spent (hours)</u> | <u>Activity</u> |
|------------|-------------------------------|--|
| 15-20 | 42 (7 daily) | Making of two garments of simple construction |
| 21-27 | 49 (7 daily) | Making of two garments of fairly difficult construction |
| 28-35 | 56 (7 daily) | Making of two garments of highly difficult construction |
| 36-38 | 21 (7 daily) | Making of one garment |
| 39-41 | 21 (7 daily) | Making of one garment |
| 42-44 | 21 (7 daily) | Making of one garment |
| 45-46 | 14 (7 daily) | Making of one garment |
| 47-48 | 14 (7 daily) | Making of one garment |
| 49-51 | 21 (7 daily) | Making of two garments |
| 52-53 | 14 (7 daily) | Making of two garments |
| 54 | 7 | Lectures on anatomy, history of costume, fashion in leather garments (nappa and suede) |
| 55 | 7 | Discussion, delivery of certificates, closing formalities |

Annex IV

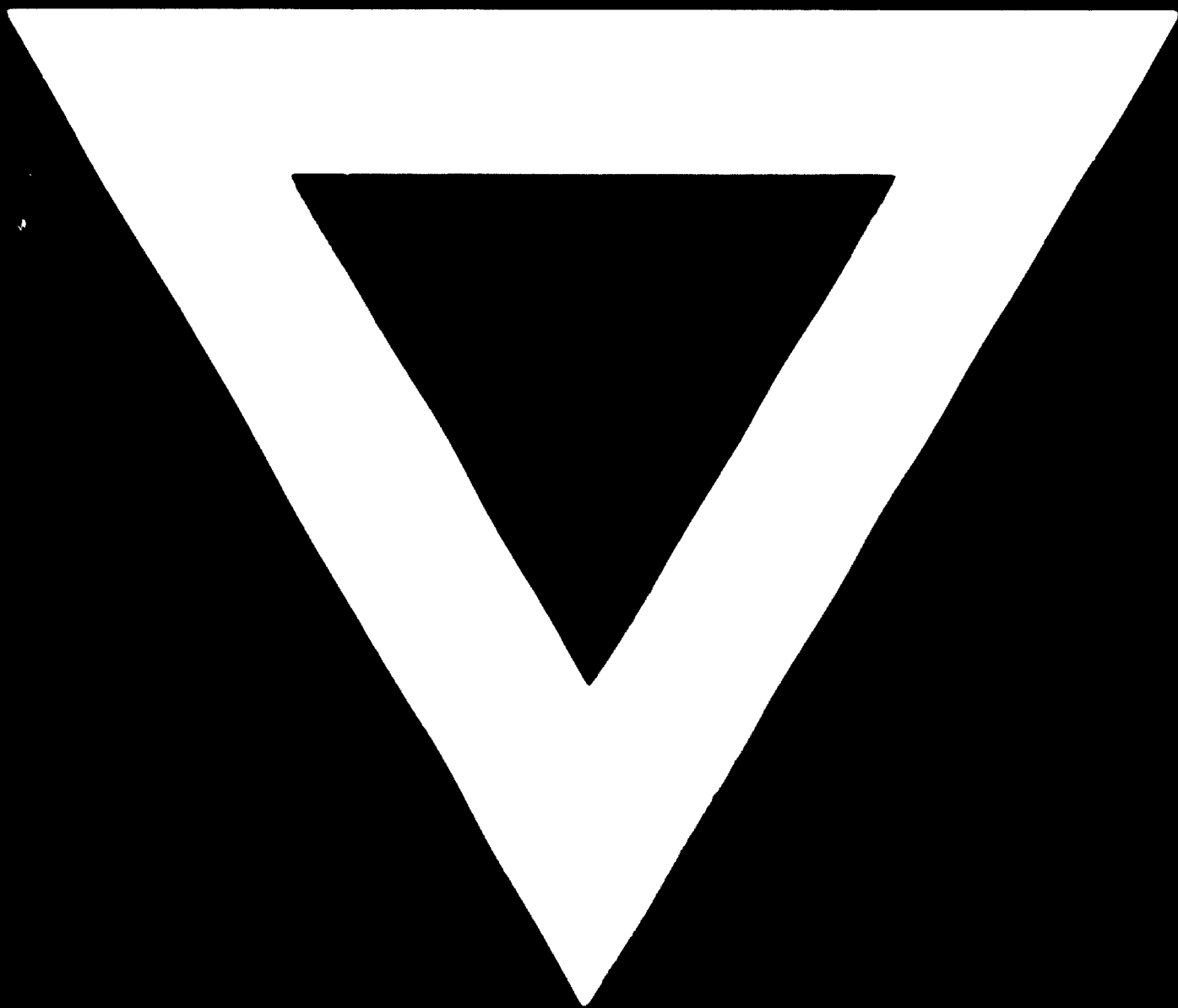
RECOMMENDED EQUIPMENT LIST FOR A TRAINING CONFECTION DEPARTMENT AT LRTI

The following list of equipment was compiled to give a general idea of the layout of a training confection department, and of the essential machinery needed for training courses on leather garment production processes. Required spare parts, apparatus and tools will be indicated later, when the official cost estimates and layout are completed.

List of equipment

| <u>Equipment</u> | <u>Specifications</u> |
|---|--|
| 10 sewing machines | One-needle, lockstitch, flatbed Presser foot (not roller presser) Unison feed (drop, needle, and walking foot feed) Stitch type: 301 Stitch length: up to 6 mm Speed: the lowest Possibility of using heavy thread Lamp with articulated bracket |
| 3 sewing machines | Two-needle, lockstitch, flatbed with disengagable right and left needles Presser foot (not roller presser) Compound feed (drop and needle feed) Stitch type: 301 Stitch length: up to 8 mm Speed: the lowest Distance between needles: 8 mm Possibility of using heavy thread Lamp with articulated bracket |
| 1 overlock machine | Safety stitch (for assembling lining) 2 needles - 4 threads Stitch type: 515/516 Lamp with articulated bracket |
| 1 zig-zag machine | One-needle, lookstitch, flatbed Straight and zig-zag sewing: 6 mm Drop feed, reverse feed Speed: the lowest Possibility of using heavy thread Lamp with articulated bracket |
| 1 press for final pressing | |
| 1 fusing machine (for attaching fusing interlinings) | Continuous running conveyor |
| 30 adjustable swivel chairs | |
| 30 work-holding container | |
| 20 tables | Dimensions: 200 cm x 100 cm |

C-6



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