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PRODUCT ADAPTATION AND UPGRADING OF QUALITY

DP/IND/72/045

INDIA.

Technical report:
METHODS TO IMPROVE THE MANUFACTURE
OF CAMPING EQUIPMENT

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

United Nations Industrial Development Organization

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United Nations Development Programme

PRODUCT ADAPTATION AND UPGRADING OF QUALITY

DP/IND/72/045

INDIA

Technical report: Methods to improve the manufacture of camping equipment

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

Based on the work of Harry V. Wagar,
expert in the manufacture of camping equipment

United Nations Industrial Development Organization
Vienna, 1977

Explanatory notes

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

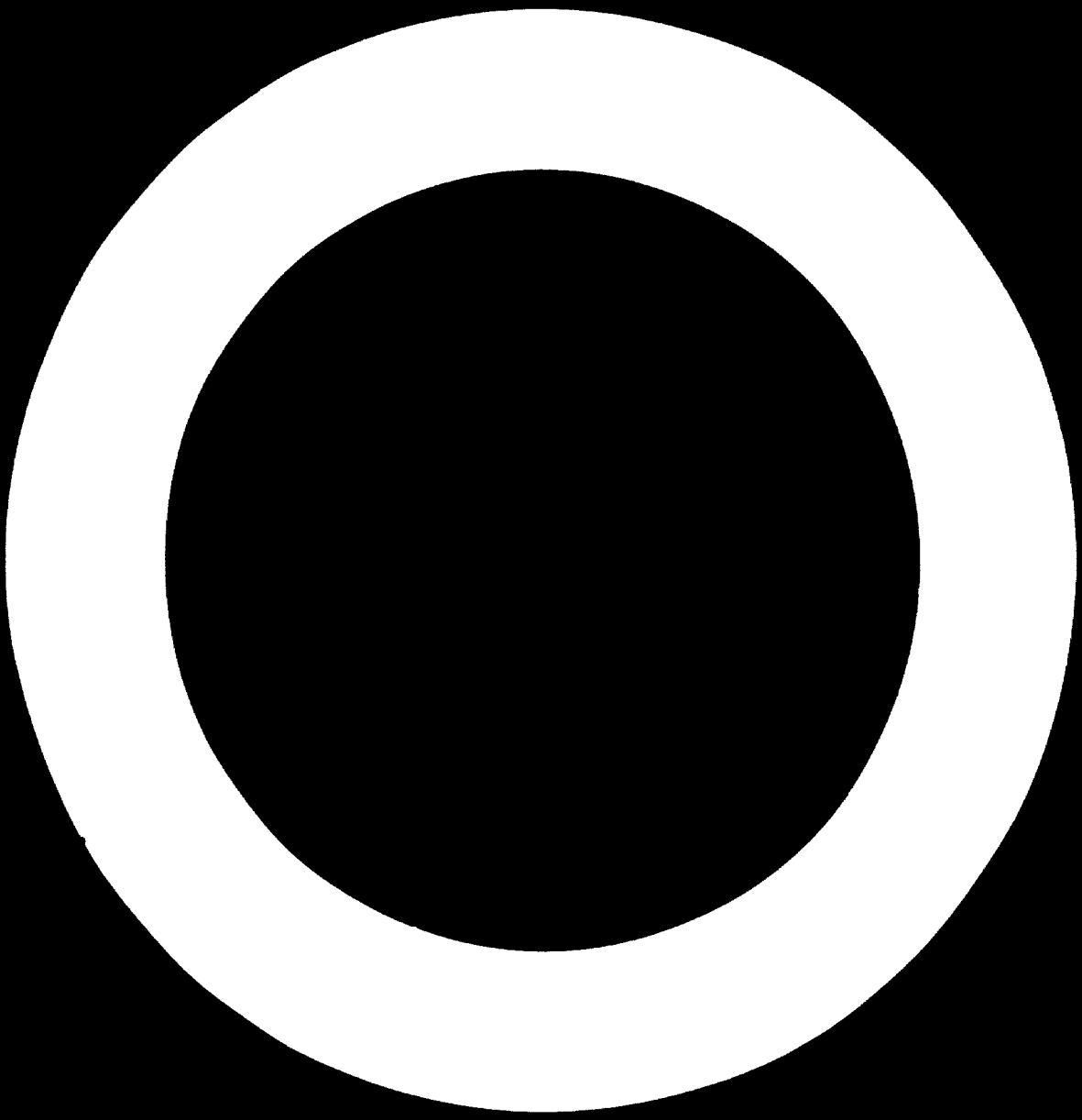
The monetary unit of India is the rupee (Rs). During the period of the project, the value of the rupee in relation to the United States dollar was $US 1 = Rs 8.80.

TDA is the Trade Development Authority.

ABSTRACT

The report covers the assignment of an expert in the manufacture of camping equipment who visited India for one month in February 1977. The purpose of the visit was to assist the Government of India through the Trade Development Authority (TDA) in improving methods of producing camping equipment to meet the requirements of world markets for such equipment. The assignment formed part of the project entitled "Product Adaptation and Upgrading of Quality" (DP/IND/72/045) sponsored by the United Nations Development Programme (UNDP). The United Nations Industrial Development Organization (UNIDO) was the executing agency.

The expert's general conclusion was that while sports articles produced in India were of good quality, the design and styling of most items would have to be modified to be suitable for export. It was most important to increase productivity in this sector if Indian manufacturers were to compete successfully on foreign markets. The comparatively small size of the production units in India was a disadvantage, but the expert felt this could be overcome by pooling marketing arrangements.



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INTRODUCTION

The project entitled "Product Adaptation and Upgrading of Quality" (DP/IND/72/045) is sponsored by the United Nations Development Programme (UNDP) and is part of a comprehensive plan of export development measures drawn up by the Government of India. The project includes assignments of experts in various sectors such as electronic equipment and sports goods. The United Nations Industrial Development Organization (UNIDO) was appointed executing agency for the project.

This report covers the assignment of an expert in the manufacture of camping equipment who visited India for the month of February 1977. The purpose of the visit was to assist the Government through the Trade Development Authority (TDA) in offering services to firms making camping equipment to improve production methods so that control costs would be reduced, to mechanize production and generally to enable the industry to produce items of the right quality and at competitive export prices to meet the requirements of world markets.

Specifically, the expert was expected:

(a) To assess the present status of the industry;

(b) To participate in in-plant visits to the various enterprises providing direct, on-the-spot consulting services, especially on problems of production planning, materials and equipment;

(c) To recommend measures to increase productivity;

(d) To advise manufacturers on the economics of plant layout;

(e) To advise on product adaptation and diversification;

(f) To put forward proposals for possible collaboration;

(g) To assist the TDA, appropriate government officials and private sector associations and enterprises in identifying the external and internal factors influencing the performance of the industrial sector concerned.

I. SUMMARY OF FINDINGS

The sports articles seen during the mission were of a good quality. Design and styling of many articles would have to be modified, however, to be better suited for export markets. It would be particularly important to refine the quality of material for the inner lining of leather bags, and to improve the design and quality of buttons for leather clothing.

Wages and other related costs of an Indian production unit amount to between 7% and 10% of those of a comparable plant in Europe. This basic advantage could not be brought to bear below a minimal plant size, however, since limited physical facilities would not permit a sizeable expansion of production. Also, the performance output is very low because of the parcelling of the already limited production space. The expert encountered plants in which 40 workers produced a large variety of goods comprising shoes, different types of bags, boxing gloves of many kinds and other articles. This situation places Indian manufacturers at a disadvantage compared with producers in Hong Kong, Malaysia and the Republic of Korea, which are the chief competitors of India on foreign markets.

The machinery and technical installations required for predominantly manual production can be improved gradually once larger orders have been obtained. A number of manufacturing units exist which would now allow the production of a given item to be broken down into various separate functions to be performed by different workers. This would be one of the prerequisites for improving productivity.

At present, the manufacturing conditions in India are suitable primarily for producing all sorts of articles manually that could not be produced by machines. Furthermore, articles requiring a large quantity of locally available material could be produced advantageously for export markets.

Productivity would be a decisive factor if Indian manufacturers were to enter export markets. As the skills of Indian manufacturers and workers are largely equivalent to those of their foreign competitors, the comparative wage advantage could be realized fully in the traditional field of manufacture. The largely manual production of cricket balls or of boxing gloves is a typical example. However, in this particular field the existing demand is limited and is not expected to expand to any considerable extent. A re-

current experience on European markets is that foreign firms disposing of large production facilities equipped with suitable machinery attempt to replace hand-made articles by industrially produced items even at the expense of quality. This tendency has led to an increased supply of sports articles on the market. It would therefore be wise for Indian manufacturers not to concentrate on such articles, which are affected by decreasing demand and stagnant prices.

As regards the use of equipment, manually operated sewing machines have disadvantages as compared with electrically driven machines. The production of tents or bags, for instance, requires uniform long stitches which cannot be done easily on a manually operated sewing machine. Manually operated machines, on the other hand, can be used without any drawback in the production of gloves. The difference in productivity between both types of sewing machines is usually expressed in the time involved: the production time for certain items with manually operated sewing machines is three times longer than the time taken by electrical machines. In the case of gloves the time differential still amounts to some 30%. The additional time required for the production of bags and rucksacks varies between 50% and 150% of that achieved with automatic (electrical) machines.

As mentioned earlier, the comparatively small size of production units in India results in a disadvantage since an export order would be dependent on a guaranteed uniform quality for a larger production quota. In addition an individual production unit cannot afford to establish its own overseas marketing mechanism. At present, the existing, predominantly small units do not employ a co-operative sales agency. If a number of small consignments were to be marketed by an export marketing agency with joint sales agents, the chances of obtaining export orders would be considerably enhanced. At the same time such arrangements would reduce price variations resulting from competitive bidding.

The expert believes that such a joint marketing arrangement can be established with the administrative support of a government agency such as the TDA, using its various branch offices overseas or the commercial attachés at the Indian Embassies. As an initial practical measure the TDA could exhibit products from various Indian producers at the sports fairs at Cologne (Federal Republic of Germany), Leipzig (German Democratic Republic), Paris and

other European and North American cities. For the export of sports articles it is important to ensure that there shall be only a short lapse of time between the order and the delivery, apart from price and quality. Also, a uniform standard of quality is indispensable. A successful first delivery often prompts subsequent orders which should be met on the same conditions. Thus, pooling for the sale and delivery of a larger export consignment should become a permanent feature rather than be done on a one-time basis.

The presentation of the exported items may affect positively or negatively the acceptability of goods, in the same way as it does when other commodities such as household or other utilitarian items are distributed locally. The packaging must withstand any outside influences to which the consignment may be normally submitted during a long transport. It would also be preferable to use transparent materials. Customers such as department or mail order stores distribute goods under their own trade names. They may not wish to have the country of origin clearly displayed on the packaging material or imprinted on the goods. There may be others who on the contrary would like to have such information explicitly given.

The production of materials in small units normally cannot compete with large-scale production in an automatized or semi-automatized fashion which permits a better, aesthetically more attractive quality, apart from more appropriate dimencions. As has been pointed out earlier production in larger plants has cost-price advantages over that in smaller units.

It is suggested further that Indian manufacturers review their price calculations since attractive prices lead to larger orders for certain sports articles. Even though the relative profits may thereby be lower, large orders will permit higher overall returns. If small quantities are being produced, the profit margin over and above the prime cost should be about 20%. Governmental bodies involved and interested in the exportation of such items may grant at least initially a certain extra bonus of about 12% on the above profit margin.

II. STATUS OF PRODUCTION AND EXPORT POTENTIAL OF SELECTED ITEMS

Bags, rucksacks and pertinent materials

The expert noticed that coarse and heavy materials are being used in the production of bags and rucksacks in India. These materials are durable and aesthetically acceptable; the design is simple and dim colours generally prevail. The workmanship including the stitching is good and solid. In their present form, however, the rucksacks are not fully suited for export to European and North American markets since different types of materials are being preferred there, such as light synthetic materials or a mix of synthetic and natural fibre materials. The latter have better soil release properties and can therefore be kept clean more easily.

Big, heavy rucksacks cannot be sold in large quantities. An important factor bearing on the marketability of a rucksack is the quality and design of its in-built metal frame. If aluminium is used for this purpose, it should in any case undergo surface treatment. Natural materials like wood have a certain aesthetic appeal. It is therefore recommended that light woods be used for the rucksack frame.

Bags made out of leather are subject to changes in fashion. During his mission the expert saw quite a number of models corresponding to the currently fashionable design and styling. In this particular field contacts with export markets seem to be lacking. In this regard, TDA could obtain through the Government (trade attachés) or from its own overseas branch offices directories of specific firms distributing this kind of article. Such lists are available everywhere in Europe and North America and permit an effective approach to potential buyers.

Boxing, cricket and hockey outfits

The articles that the expert noted in this particular domain were generally of an outstanding quality and presentation. As these items are entirely manually manufactured, they should have good export prospects. It should be borne in mind, however, that this specific market expands slowly. Possible export quota and the related production capacities could therefore only increase gradually. The production of gloves for cricket and hockey also conforms to existing requirements for quality. However, the cutting of materials for these articles seems to be outdated even as manually produced.

The relevant work procedure could be simplified with relatively small additional investments. For this purpose, cutting cables, rolls and electrically operated knives or saws would be required. In this field the existing export contacts could be expanded.

Both models and basic qualities of these sports articles are continuous and invariable. Should changes or modifications be requested these could be easily made according to samples provided by buyers. The production characteristics in this field permit a quick and accurate adjustment, which is important since buyers usually ask for a number of tenders prior to placing an order.

Camping and tent industries

The expert visited a number of firms producing various types of tents and other items. There are also firms which apart from producing tents make the cotton material for this product. At present, however the kind of tents produced is not suitable for the demand in European or North American markets.

Sleeping bags

Although the models are quite satisfactory, the sleeping bags are too heavy, and the price calculations seem to be high. Both material and filling, given the present price conditions, are not competitive with European producers. In this field the demand for synthetic fibre materials is significant. Therefore, only far-reaching changes in materials would allow access to overseas markets. It should be emphasized, however, that the expert noted sleeping bags only in one instance in which this item was produced in a small quantity as a sort of sideline.

Tents

In the few plants visited the tents are almost entirely (some 95%) hand-stitched. They are suitable for the needs of armed forces and other domestic demand and perhaps would fulfil the requirements of a number of Middle-Eastern countries for large sales tents manufactured in a three-ply design. They are medium- and small-sized tents designed for use in expeditions, mountain tracking etc. The price calculations and quotations provided by the manufacturers definitely exceed the price range within which these tents could

be competitive on European and North American markets. One manufacturer visited at the time did not have orders or workers employed; all inventory and outfit had been mortgaged to a bank. This production unit is definitely not in a position to export any item since it is not competitive even on the domestic market. The expert saw many production units producing various types of sports articles and interested in including tents and camping articles in their production programmes. During the meetings and discussions with these manufacturers the expert furnished typical designs suitable for European markets and specified material requirements.

The expert expects to send further material samples which will help in the selection of appropriate colours, stitching and dressing. He will also make available sample tents suitable for the production for export on a large scale. After an initial period of experimentation and practical product adaptation, lasting perhaps two years, a larger quota of tents could be exported to European and North American markets.

The major tasks in the meantime will be to enhance the quality of materials, the durability of colours and the dressing. These preparatory efforts will require some time since the material accounts for 70% of the total manufacturing cost. The development of good quality and economically acceptable tent material is most important.

Initially, export tents could be manufactured using manually operated sewing machines. Manual stitching should not be used for producing camping tents, however. Additional tools that might be required, such as special design hammers, stamps, dies etc., could be produced locally. Should larger export orders eventually be forthcoming, the installation of special sewing machines might be indicated.

Indian tent manufacturers should concentrate primarily on the production of tents made of cotton and laminated cotton, thus limiting themselves to a few standard types which are required continuously on the aforementioned markets. Design samples are easily available; the models barely change and techniques for their production do not pose any specific problems.

It is, however, anticipated that difficulties will have to be overcome in the production of pertinent accessories. Poles and pegs are not yet of the desired quality; they are also too expensive. Further, reliable top

quality zips are not yet available on the local market and would have to be imported initially for this purpose.

The Republic of Korea is considered to be one of the main competitors on the European and North American markets. Manufacturers in this country produce tents primarily from materials made of synthetic fibre such as acryl laminated with nylon. The list of plants that the TDA had prepared for the expert's mission included only one large manufacturing unit with some 12,000 workers. As this plant produces primarily tents and other outfits for the armed forces, access to its production facilities was not allowed. The expert met with the general manager and the production manager, however, and could inspect tents that had been erected at the factory premises outside. He was informed that these tents were being made using electrical sewing machines of imported brands (Pfaff and Singer).

As regards swift changes in the production programme, small family units seem to be rather flexible. Various small plants at Kanpur situated in Uttar Pradesh were in a position, for instance, to present new models within two days on the basis of the design suggestions made by the expert. Given the average size of production plants for sports articles, they could be expected to adjust their production programme to include export articles within six months to two years.

The expert meanwhile has arranged for typical samples from the European market to be made available to Indian manufacturers through the TDA. This will enable manufacturers to study and copy the samples and to train their workers for eventual production and to search for suitable materials available locally.

Camping furniture

In this particular field export prospects would appear to be very promising since the styling, production quality and finish are very advanced. After sales talks with interested buyers overseas, it will be clear to what extent the sales price will be influenced by the transport cost of these items, which are sometimes bulky.

There is still room for broadening the existing model range. Material (cotton) specifications should be requested from prospective buyers. Also

in this respect the expert will provide samples, designs, sketches and a list of potentially interested parties in Europe. Some standard specifications for material are given below:

Material for the tent-ground:

Cloth, laminated or polyglass	300 - 400 g/m^2
Cloth for sleeping cabin and inside roof	100 - 150 g/m^2
Cloth for small tents	210 - 250 g/m^2
Cloth for large tents	300 - 350 g/m^2
Cloth, laminated	400 - 450 g/m^2
Nylon cloth, laminated	80 - 100 g/m^2

Tents and their pertinent materials should have the following properties:

(a) The shrinkage of the tent material used for the overfly may not exceed 3% in each direction when exposed to extremely humid or dry weather conditions. The pulling strength of the material for both dry and humid conditions should have a minimum of 80 to 100 kg (daN), the so-called specification tearing strength (resistance) should be 2 kg (daN) at a minimum. The dies and impregnation must resist weather conditions, wear and tear and other mechanical influences;

(b) The pulling strength of the inner fly material should be in the order of 30-40 kg (daN). All materials must be fully resistant to any type of fungus;

(c) The material for the floor section should consist of synthetic foil or otherwise laminated cotton material. A pulling strength of 20 kg (daN) is required. The stretching, using a pulling force of 5 kg (daN), should not exceed 10%. The continuance of outer resistance should be a minimum of 1 kg (daN);

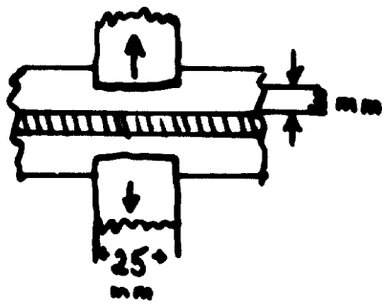
(d) A diameter of 3 mm is required for the supportive tent ropes. The connection between tent and rope must withstand a minimum pulling strength of 50 kg (daN);

(e) Rope rings should be elastic and able to withstand a pulling strength of 40 kg (daN);

(f) Zips, pegs and 'eyes' must be resistant to corrosion. The cross pulling strength of the zips should be:

35 kg (daN) for small tents
55 kg for upper fly
35 kg for inner fly

(see also sketch below)



(g) Gauze windows (bulls' eyes) should be manufactured from synthetic materials;

(h) Alternatively, tent windows can be produced from synthetic foils. Such foils should be transparent, light and resistant to ultraviolet rays. The foil may not harden or break under any conditions (when folded). The material must be soft without scratches;

(i) The size and design of tent bags depend on the type of tent they are destined for. A bag made from polyethylene or similar materials would be sufficient for small tents. In the case of bigger tents it would be preferable to use the same materials as used for the pertinent tent. The bags must contain an indication of its content (e.g. one outer-fly No. 661524; model: Batavia);

(j) The outer-fly has to be absolutely waterproof. A test can be carried out according to the sketch below. The distance between tent and watergun should be 7 m; the diameter of the spraying nozzle 12 mm; the water pressure 3 bar, at a flow rate of 140 litres per minute.

Basic data for the installation of a production unit with a monthly capacity of 2,000 tents of various types and sizes are as follows:

(a) Staff requirements

Production foreman	1
Production supervisor	1
Production mechanic	1
Workers	35

It is assumed that such a production unit operates on one shift of eight hours, with a supplementary work-time of four hours on Saturdays. In this case the following equipment is required:

Foot-driven sewing machines	35
Cutting table	1
Control table for materials	1
Large wooden anvil	1
Final control table for tents	1

The following tools are required:

Electrical cutting machine	1
Folding table	1
Transport boxes	60 (approximately)
Sitting chairs	30
Supportive structures for material rolls	2

The production of one small tent requires in Europe one hour. For a model plant under local conditions a production time of three hours per tent has been assumed. This assumption has been made taking into account the climatic conditions and the present productivity as well as the training background of workers.

The cutting table would have to be 15 m long, 170 cm broad and 80 cm high. It must be completely plain, with a polished surface.

The control table for the material must be fitted with good lamps (tube lights) covered by a glass reflector, above which the material can be inspected for any deficiencies. The control table for the tents must have a length of 5 m with a breadth of 150 cm and a height of 70 cm.

The electrical cutting machine should be equipped with an 8-in. knife costing approximately $US 800.

The transport boxes should not have wheels since the underground will not usually be of even surface. Their size should be 120 x 80 x 80 cm with the inner walls polished, thereby avoiding any sharp edges which could damage the materials. Very strong canvas materials could be used to make these boxes.

When cutting the material it should be put on the cutting table in approximately 100 layers. The length of the material pieces depends on the dimensions desired. The electrical cutter will then cut 100 pieces of exactly the same size and dimensions.

The sewing machines must be installed at sufficient distances in order that one worker should not step on the material of the adjacent sewer/worker.

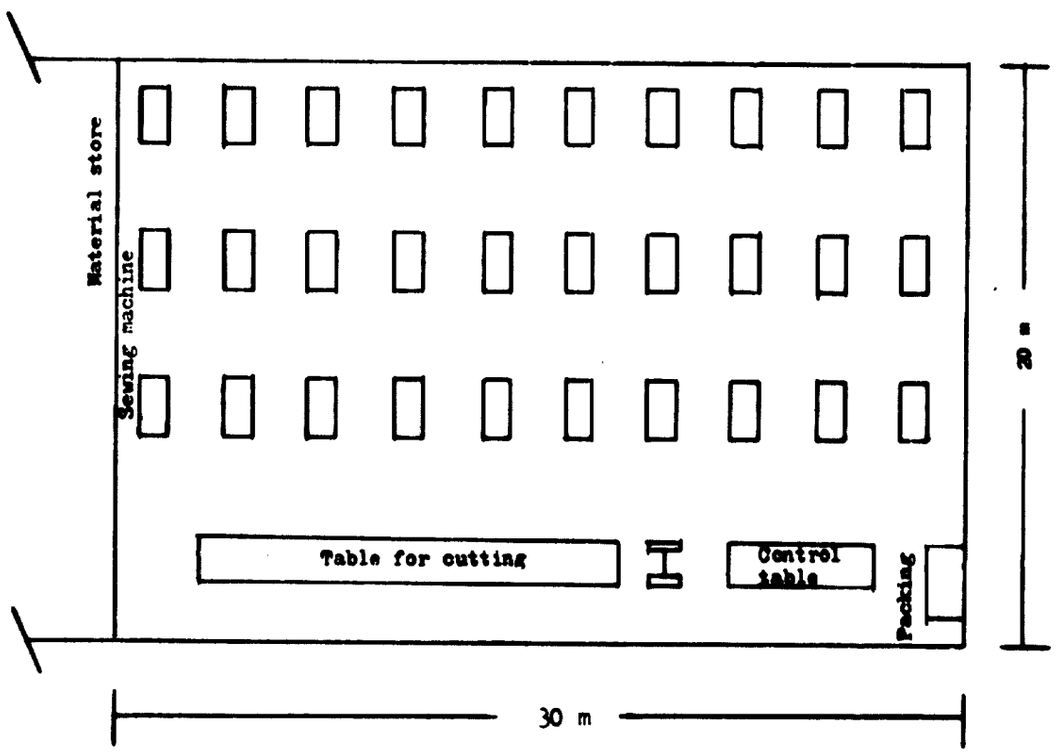
It should be ensured that a ready-made tent should under no circumstanoes be stained or have material deficiencies. The tents shown to the expert did not fulfil these conditions and, therefore, could not be considered as suitable for export. This is the main reason why the working room should be rather large.

If at a later stage electrical sewing machines were to be installed, some 20 machines would be required. Preferably, sewing machines should be acquired that have triple transport arrangements using both a one- and two-needle mechanism. For the reinforcements special rack and bar sewing machines are required. When the manufactured items are being dispatched, careful attention should be given to the labelling of the boxes as well as to the description of the final packaging.

After the consignment has left the factory the entrepreneur's task is not yet completed. He has to ensure that shipping dates, port transfer etc. conform with his delivery schedule.

A basic pattern for the production plant outlined above is shown in the figure.

Drawing of a factory



III. CONCLUSIONS AND RECOMMENDATIONS

The following are the consultant's major conclusions and recommendations:

1. Selected Indian manufacturers should be encouraged to participate in European fairs for sports articles. This could be arranged with the assistance of TDA.

2. Standard samples of tents, sleeping bags, rucksaks etc. should be distributed to manufacturers who have been selected by TDA or other appropriate authorities, in order to improve the quality and the design of the products.

3. TDA overseas offices and Indian trade attachés should obtain the necessary documentation and information from overseas buyers.

Annex

TOUR PROGRAMME OF EXPERT
(From 2 February 1977)

Date	Time	Address of firm	Contact executive	Phone
2/2/1977 Wednesday	5.00 a.m.	Arrival New Delhi		
	11.00 a.m.	Meeting UNDP		
	3.00 p.m.	Meeting TDA		
3/2/1977 Thursday	10.00 a.m.	Meeting TDA		
	11.00 a.m.	Sarma Web Equipment Mfg. Co. 7197 Kutab Road New Delhi 110 055	B. S. Sarma	519314
	3.00 p.m.	West Coast Manufacturers and Traders 92 - U.B. Jawahar Nagar New Delhi 110 007	Lajpat Anand	223900
4/2/1977 Friday	10.00 a.m.	Sarma Web Equipment Mfg. Co.	B. S. Sarma	
5/2/1977	11.00 a.m.	Export Fair, Hotel Ashoka		
		Sarma Web Equipment Mfg. Co.	B. S. Sarma	
		Ramnath Exports Private Ltd.	R. K. Mittal	70835
		Reflex International Pvt. Ltd.	Mukesh Jain	562645
		Kumar Exports	Anand	525684
6/2/1977 Sunday	12.40 p.m.	Departure for Jullundur by train		
7/2/1977 Monday	10.00 a.m.	Universal Sports Industries 246-A, Islamabad, G. T. Road Jullundur 1	A. N. Chadha	6267
	3.00 p.m.	F. C. Sondhi and Co. Pvt. Ltd. Basti Sheikh Road Jullundur 14400	O. P. Pahwa	6159

Date	Time	Address of firm	Contact executive	Phone
8/2/1977 Tuesday	10.00 a.m.	Universal Sports Industries		
	2.20 p.m.	Departure for New Delhi by train		
9/2/1977 Wednesday	11.00 a.m.	Sports Equipment Ltd. New Delhi 110 049		
	4.00 p.m.	Ramnath Exports Private Ltd.	Mittal	70835
			Ravindra Kumar	622467
10/2/1977	3.00 p.m.	Ramnath Exports Pvt. Ltd.	Ravindra Kumar	
11/2/77 Friday	Indian holiday			
12/2/1977 Saturday	Indian holiday			
13/2/1977 Sunday	6.55 p.m.	Departure for Kanpur		
14/2/1977 Monday	10.00 a.m.	Rahim Overseas Corporation Manufacturers and Exporters Leather Garments; Leather Goods and Textiles 89/208 Bangamandi Kanpur-1	Mohamad Ahmad	64052
15/2/1977 Tuesday	10.00 a.m.	Rahim Overseas Corporation	Mohamad Ahmad	
	2.45 p.m.	Cawnpore Dyeing and Cloth Printing Co. Ltd. 14/64 Civil Lines Post Box No. 73 Kanpur	R. Shirivastav General Secretary	62215
16/2/1977 Wednesday	10.00 a.m.	Shaharyaz Saddlery Corporation 90/119-5 Atikhara Bld. Kanpur 208004	Mirza Shabaryaz	69853

Date	Time	Address of firm	Contact executive	Phone
	2.00 p.m.	Rahim Overseas Corporation	Mohamed Ahmad	
17/2/77 Thursday	10.00 a.m.	Industrial Enterprises 83/258 A. Juhi, Kanpur	K. Garg	69148
	4.00 p.m.	U.P. Export Corporation D-27 Sarvodaya Nagar, Kanpur 208005	V. K. Goyal	8072
18/2/1977 Friday	10.00 a.m.	U.P. Ordnance Factory Headquarter Sarvodaya Nagar, Kanpur-5	K. L. Bajaj	
	1.30 p.m.	Industrial Enterprises	K. Garg	
	5.00 p.m.	Rahim Overseas Corporation	Mohamed Ahmad	
19/2/1977 Saturday	9.45 a.m.	U.P. Ordnance Factory	K. L. Bajaj	
	2.30 p.m.	Rahim Overseas Corporation	Mohamed Ahmad	
	4.20 p.m.	Departure for New Delhi		
20/2/1977 Sunday	Holiday			
21/2/1977 Monday	11.00 a.m.	UNDP		
	3.00 p.m.	Ramnath Exports Pvt. Ltd. A-7, Green Park, New Delhi-110016	Radhey Lall President	
22/2/1977 Tuesday	3.00 p.m.	UNDP		
23/2/1977 Wednesday	10.00 a.m.	Ramnath Exports Pvt. Ltd.	Ravindra Kunmar	
	2.30 p.m.	Debriefing TDA		

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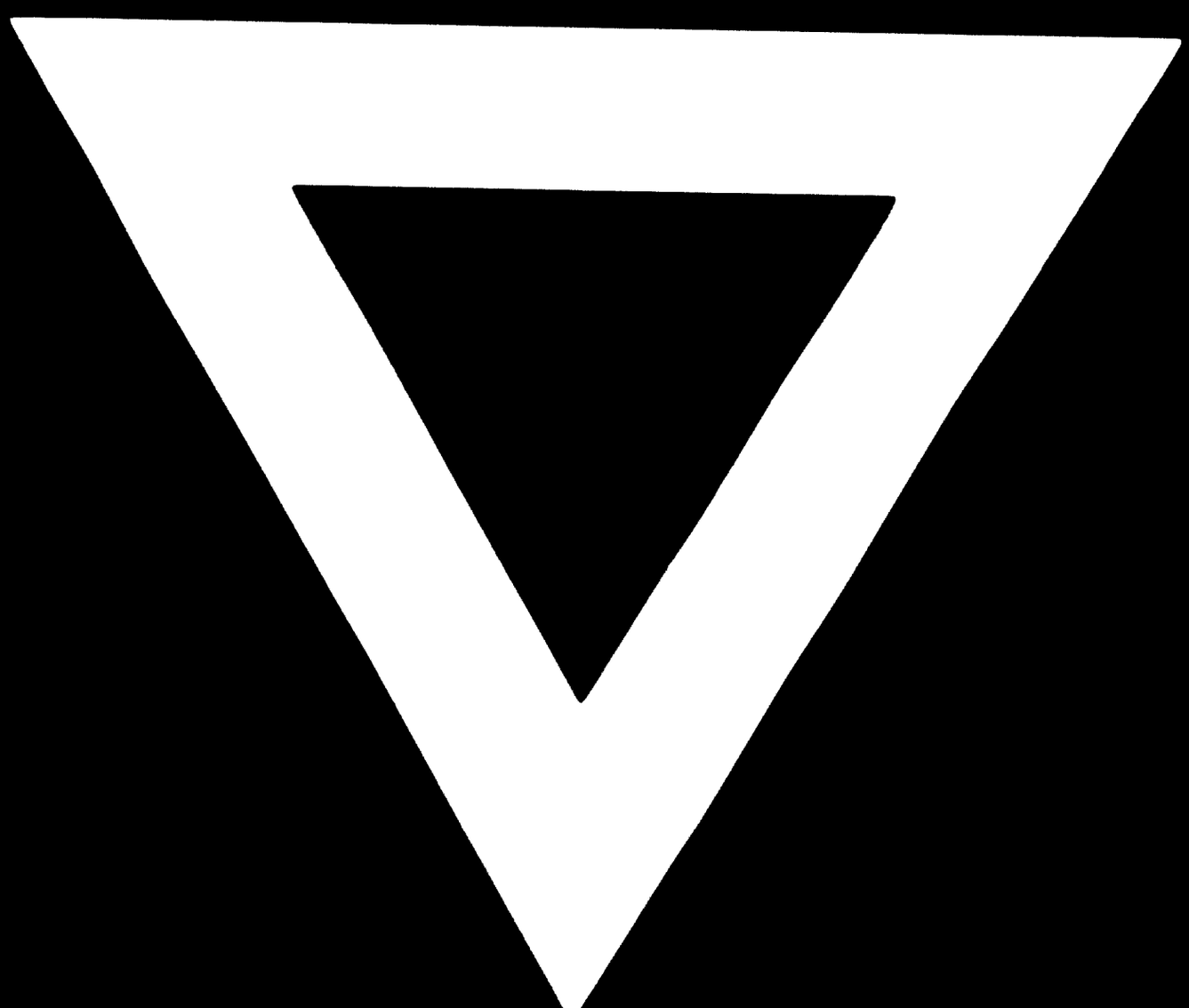

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