

CHAPTER 6

**CHADDAR INDUSTRY IN
SOLAPUR CITY: DEVELOPMENT
AND
MANUFACTURING PROCESS**

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CHAPTER 6

CHADDAR INDUSTRY IN SOLAPUR CITY:

DEVELOPMENT AND MANUFACTURING PROCESS

PART I

DEVELOPMENT

6.1 INTRODUCTION

Solapur is famous as a big industrial town in the Western Maharashtra. Base of the economic development of the Solapur City is the textile industry, which has passed through many ups and downs in the last 55 years. Variety of products right from the ordinary cloth silk, synthetic cloth, long cloth to towels and world famous Jacquard Chaddars are being manufactured in Solapur City.

In 2003 the textile industry in Solapur City provided direct and indirect employment to more than 1.5 lakh people. N. G. mills (1898) and Jam mills (1909) employs about 4000 workers. Yashwant and Solapur Co-op. Spinning mills employ around 3000 to 4000 workers and rest of the small units employ about 10,000 workers where as the decentralized powerloom sector (which includes chaddar industry) provides employment to one lakh workers. This is ever expanding¹.

Solapur has the benefit of being on the border of Karnataka, Andhra and Maharashtra and also being accessible to the major

industrial towns in the country through the wide spread network of railway. Industrial place is also an important cause behind the industrial development of Solapur City for the last 55 years.

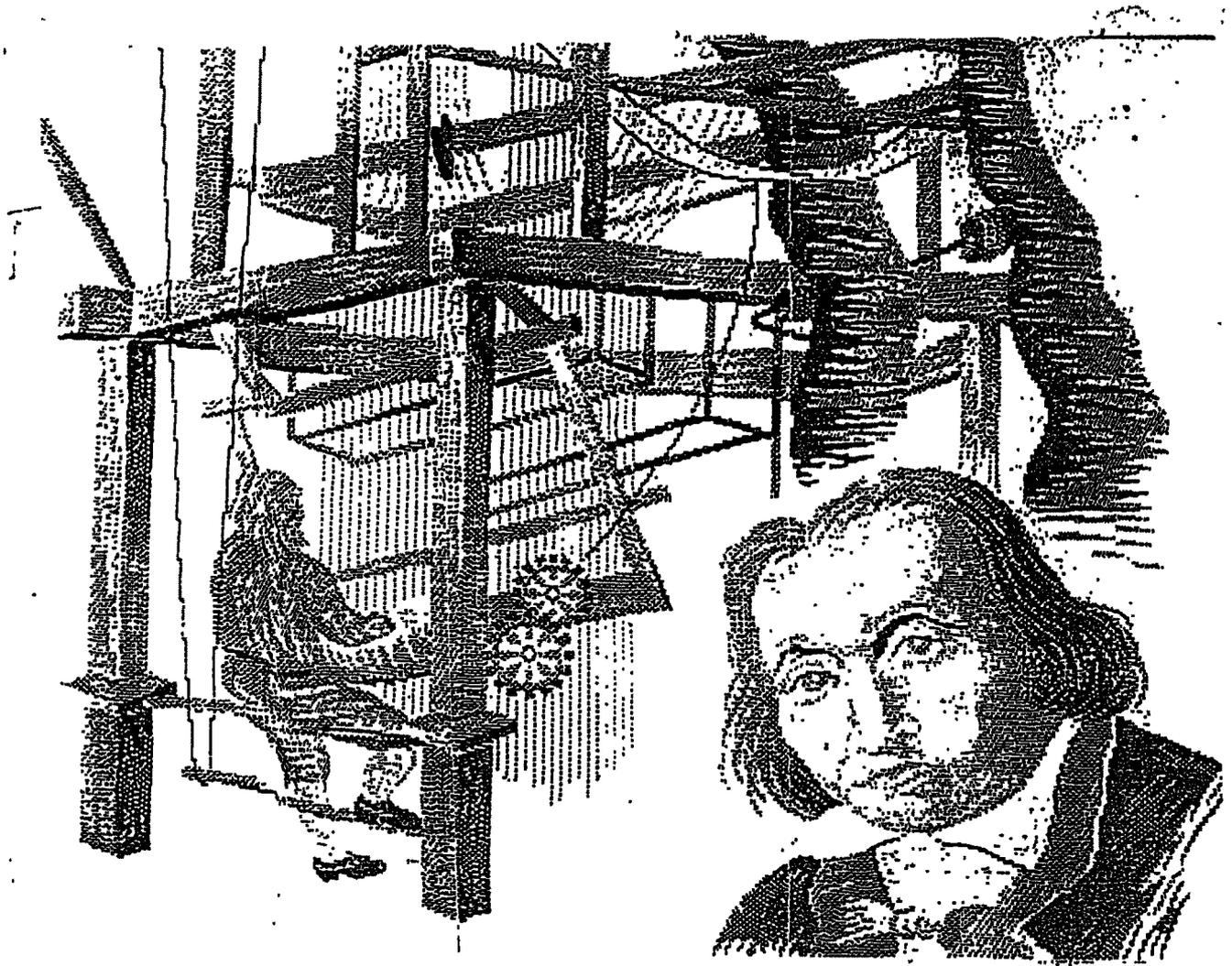
All these factors in addition to the favorable climate have led to Solapur, achieving a prominent place on the industrial map of the country. Solapur City is the first and foremost manufacturer of chaddars in the world. Jacquard chaddar is a unique product manufactured in Solapur City. The Jacquard chaddar has taken the name of Solapur City on the international map.

6.2 JACQUARD CHADDAR: HISTORICAL PERSPECTIVE

Solapur spinning and weaving mill (Juni Mill) is the oldest mill in Solapur City. Ever since its establishment on 28th Dec. 1876, Juni Mill has contributed a lot to the economic development of Solapur City for well over 55 years. It too has passed through numerous ups and downs and had to pass many turbulent years. It kept on expanding its capacity in various phases up to 1921. It employed about 3000 workers and its products had an international market. It had a technical institute on the same lines as the

Plate 1

JOSEPH - MARIE - JACQUARD



current day Research & Development. It is said that it's superintendent Mr. 'So's, with the help of one of the workers, Allauddein first produced the Jacquard Chaddar in Solapur which is now popularly referred as the 'Solapur Chaddar' or 'Jacquard Chaddar.' Thus in the respect of chaddar manufacturing Solapur owes a lot to Juni Mill for giving it quality chaddars².

Around 1947, Solapur spinning and weaving Mills, Solapur popularly known as 'Juni Mill' was closed down. This has resulted into a serious setback to the textile working community in Solapur. It had created displacement of labour and problem of unemployment. This has however resulted into the beginning of decentralization in the sector of powerlooms.

In order to solve their employment problem, the skilled labour from Juni Mill, purchased the old powerlooms of the said mill and started manufacturing variety of products. Jacquard Chaddar is one of the products manufactured on these powerlooms. The pioneer of Solapur Chaddars Mr. K.S. Kshirsagar was working under Allauddein master right from 1918 to 1946 in Juni Mill. After the close down of Juni Mill he too started manufacturing chaddars on his own in 1948. His contribution to the development of chaddar industry is vital.

The tradition continued when Mr. Rangnath Kshirsagar started, 'Kshirsagar Textiles'. On similar lines many of the Juni Mill workers started their own units resulting in a rapid growth of this Industry since 1953. The Padmashali community migrated from then Hyderabad State to Solapur has also made valuable contribution to the development of powerlooms and handloom industry in Solapur.

6.3 JACQUARD CHADDAR: SPECIALTY OF SOLAPUR

The Solapur Chaddar is popularly known as Jacquard Chaddar. It would be very interesting to know why it is called Jacquard Chaddar. In order to produce large figure designs, many experts and technicians developed variety of machines. But the machine and technique developed by Mr. Jacquard a French technician proved to be very effective in producing quality chaddars with large figure designs. This machine was used for the first time by Mr. So's for the manufacturing of chaddars in Solapur. Ever since then chaddars manufactured on such machines were named after Mr. Jacquard. This is how it was named popularly as, 'Jacquard Chaddar'. Thus the Jacquard chaddar is named after Mr. Jacquard Joseph M.

6.4 JACQUARD MACHINE

In the textile industry the following two methods are generally adopted for the ornamentation of textile fabrics:

- i. During the manufacturing of cloth**
- ii. After the manufacturing of cloth**

In the first method the ornamentation of fabric is accomplished during weaving or manufacturing by the following means:

- a. The ornamentation of fabric is done by the introduction of more than one colour count or quality in the warp or weft or both. The ornamentation in the warp is done in the preparatory department and in the weft by means of a multiple box motion.**
- b. Again the ornamentation of fabric is done by the constant variation in the number of warp threads in the top and bottom lines of shade in successive picks so as to reveal or conceal certain threads to form an effective pattern on the face or back of the cloth. This is accomplished by means of tappet dobbies jacquard. The figures designed are produced by jacquard small figures by dobbies and standard weaves by tappets.**

In the latter method the woven fabrics are dyed, printed, embossed or embroidered³.

Mr. Falcon and Mr. Vaucanson's inventions and Jacquard machine were introduced to produce large patterns of design on fabrics by the first method. While the former two inventions are now out of use. The jacquard is universally used in the industry for producing large figure designs.

In 1801 Mr. Joseph M. Jacquard completed his first model, which he exhibited at national exhibition at Paris. Mr. Jacquard used falcon's machine but he drilled the needle board and cylinder to form diagonal instead of vertical rows of holes and perforated the cards to suit the arrangements of the needles. However this plan was soon given up.

The Jacquard is a shedding device placed at the top of the loom to produce large figure patterns by using a very large number of warp threads separately, by means of harness cords, hooks and needles, but without any heald shaft. It is the finest of all machines for making the figure woven fabrics that have ever been invented and far superior in capacity to a dobbie. Each hook in a Jacquard represents a single heald. The principle of Jacquard shedding is that each mail eye is connected separately to its hook by means of a harness. If there is a perforation in the pattern card, the hook is left over the knife and when the knife goes up it carries the hook, the harness and the mail eye with the warp end to

form the top line of shed. This bottom line of warp is maintained or is produced by cylindrical dead weights⁴.

◆ **CHARACTERISTICS OF JACQUARD MACHINE**

The Jacquard is a shedding machine used for selecting and lifting warp threads for each pick. It produces large patterns of design in which all or most of the warp threads move independently in a repeat of the design to reproduce elaborate details and flowing lines in a fabric. The following distinctive features characterize the jacquard weaving:

- (i) Sketching, designing, card cutting and lacing,
- (ii) Harness building
- (iii) Lifting the grieffe, knives and hooks and
- (iv) Rotation of card cylinder

The Jacquard machines as used in the modern textile industry are numerous and vary, but are generally classified into four distinctive groups.

- a. **Single Lift Jacquard**
- b. **Double Lift Single Cylinder Jacquard**
- c. **Double Lift Double Jacquard**

Jacquards for special uses viz. Crossborder jacquard, Twilling or Damask Jacquard, Leno Jacquard, Double shed Jacquard, compound Jacquard etc. Besides, there are also special types of Jacquard viz. Open

shed Jacquard, Electrical Jacquard, Verdol Jacquard, fine pitch Jacquard, etc. The variety of Jacquard proves that no single machine is suitable for all-purpose.

The single lift Jacquard is seldom used in powerlooms except for special requirements being too slow and involving much power consumption, but it is universally used in handlooms. The Twilling Jacquard is constructed on the single lift principle with single cylinder. The two kinds that are most extensively used in the Chaddar Industry are the double lift single cylinder and the double lift double cylinder Jacquard.

6.5 UNIQUE FEATURES OF THE JACQUARD CHADDAR

The Jacquard chaddars are durable, they are available in a verity of attractive designs. The designs consist of small and large figures. The chaddars have versatility and aesthetic appeal. The most important features are the chaddars available at reasonable prices.

Solapur chaddars are made available in different sizes viz. 43-90, 54-90,60-90. Every attempt is made to tailor it to the needs of the consumers of different economic classes from different states and countries.

The most common and popular varieties of chaddars made available by majority of the manufacturers in Solapur are Janata, Deluxe, Special white, Mayurpankh, Sargam and Pariydarshini etc. of these, Janata, Deluxe and Mayurpankh are the varieties, which are manufactured by almost all the manufactures⁵.

PART II
MANUFACTURING PROCESS

6.6 INTRODUCTION

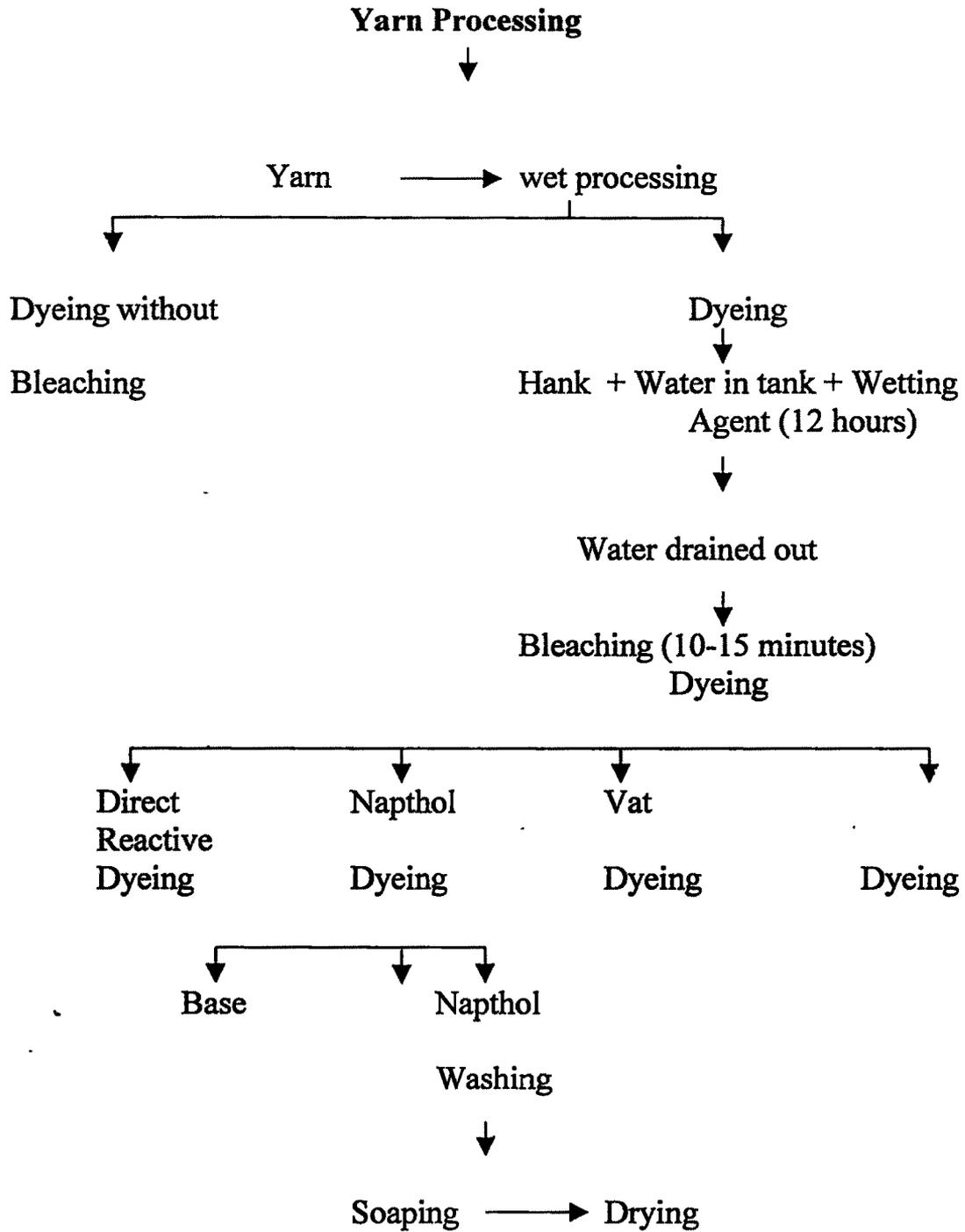
Mostly illiterate people run the traditional business of powerloom industry in Solapur. Besides there are number of problems and drawbacks in this industry (mostly 8 to 12 looms in factory). However it runs successfully only because of hard working of factory owners whole family (12 to 16 hours per day) and their fine skill. In this powerloom industry all the activities and processes, which are much complicated and tedious, are carried out at only one place. Probably Solapur is the only place in India where all the processes like Doubling, Dyeing, Winding, Warping, Weaving, Finishing, Packing, Marketing etc. are done in one and the same premises. Because of illiteracy and parsimoniousness of factory owners, delegation of work, planning management, which is found at Solapur will be found rarely any other place. As most of the factory owners are basically from labour families, the family relation with affection is developed between workers and owners.

In the industry of powerlooms, manufacturing chaddars and towels, most of the processes are carried out manually. Modern machinery in any of the processes will not be found, as all the

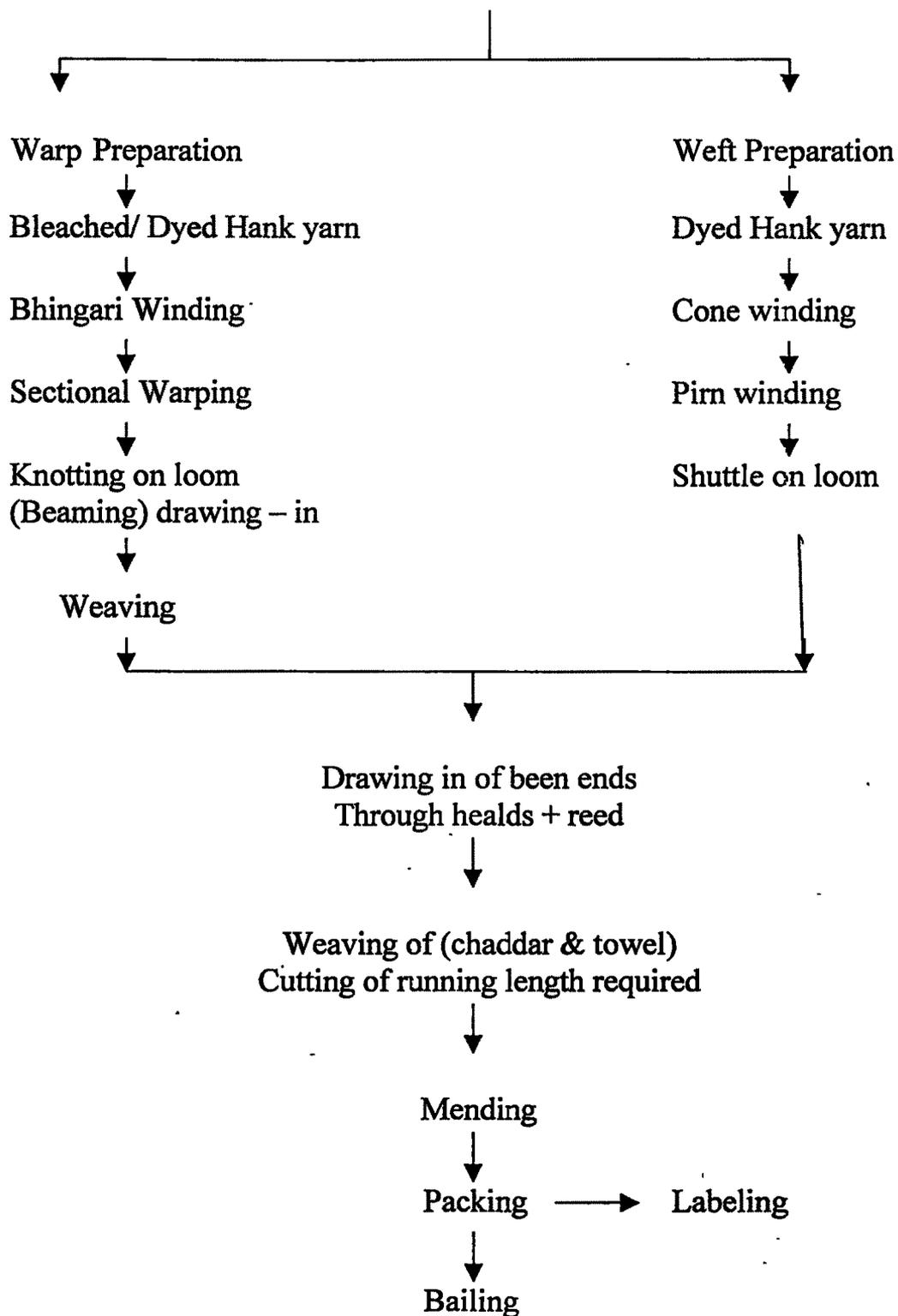
machinery is totally conventional. Dyeing, Finishing, Packing etc. are done manually while Winding, Warping, Weaving etc. are carried out on scrap models of conventional machines. In most of the powerloom industries elsewhere one worker handles minimum of four looms, whereas in Solapur one worker is working on one loom only. The worker required in back processes and other than weaving are three to four times more of loom workers. Hence the manpower required in the Solapur powerloom industry is much more. The labour shortage is a big problem in this industry. Absence of labour in back process collapses the entire production line. In this situation the family members of the factory owners manage the work⁶.

6.7 MANUFACTURING PROCESS

The following flow chart gives details about the manufacturing process of Jacquard chaddars.



WEAVING PREPARATORY



The yarn in the form of cone or hank undergoes a number of processes till it is converted into a chaddar and other related products.

Following are the various processes, which are carried out on the cotton yarn, during the manufacturing of textile products in general and chaddars in particular.

6.8 YARN PROCESSING

This is the first important process in the manufacturing of chaddars and towels. The warp is processed while there is no processing treatment required for weft. It is used in grey form. However in some cases where the chaddars are for export or against special orders, the weft yarn is also bleached.

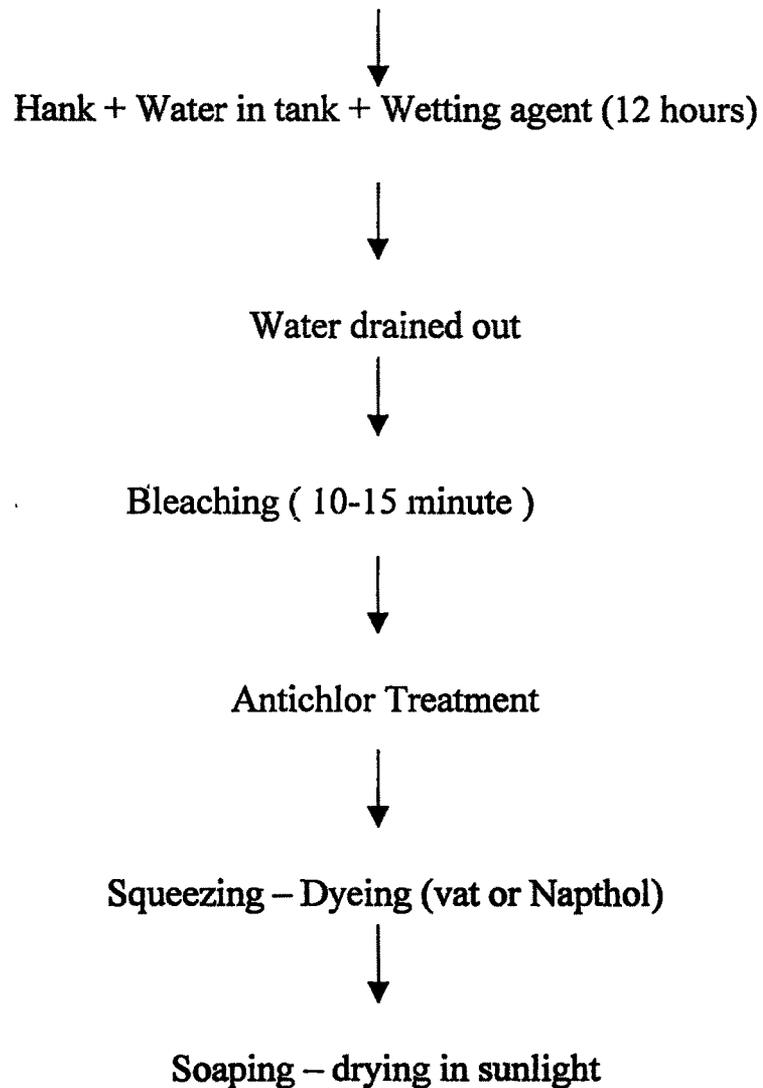
(a) Dyeing

Grey yarn in hank form is taken for dyeing and optical whitening. Wetting process of gray yarn is done for whole night. In this process the hanks of gray yarn are submerged in water containing wetting agent for overnight. Next day morning the hanks are taken out and washed in cold water. This yarn is then taken for bleaching process, wherein the cotton impurities and colouring matter are removed. This yarn becomes off-white. After bleaching this bleached yarn is taken for antichlorination. This is done by agents like peroxide or sodium Bi-sulphite etc. The hanks are washed and squeezed. This yarn is now ready for dyeing or optical whitening. Various types of dyes are used for dyeing the yarn,

for chaddars, naphthols, direct dyes, terry towel dyes like reactive, vat and direct dyes are used. For optical whitening optical whiteners are used. Their dyes and whiteners are used as per requirement. Then the yarn is squeezed and dried.

The high priced chaddar require over night wetting and next day it is bleached. The extra yarn is directly dyed without wetting and bleaching as a dark colour is applied to it .All the power loom factories do not soap the material after dyeing. Factories catering to the export market give kier-boil before bleaching. Usually the problem of uneven dyeing, colour brightness, whiteness in bleaching etc. is faced. Testing facilities like analysis of dyes, colour matching, colour fastness is very essential⁷. The processes from wetting to sunlight drying are presented in the following flow chart.

WET PROCESSING SEQUENCE



◆ TYPES OF DYES USED

For dyeing of chaddars and towels generally four types of dyes are used, viz.

I. Vat

II. Napthol

III. Procion

IV. Sulphur

I. VAT

In the vat dye, colours like green, violet, blue, bottle green are mixed up so that the colour goes along with the dye during the dyeing process.

II. NAPTHOL

With the naphthol dye, colours like red, blue, shaukatal (green), bottle green, orange and yellow are mixed up.

III. SULPHUR

Only black colour is mixed up with the sulphur dye.

IV. PROCION

The procion dyes are those kind of dyes which are recently put into and are not extensively.

6.9 WINDING

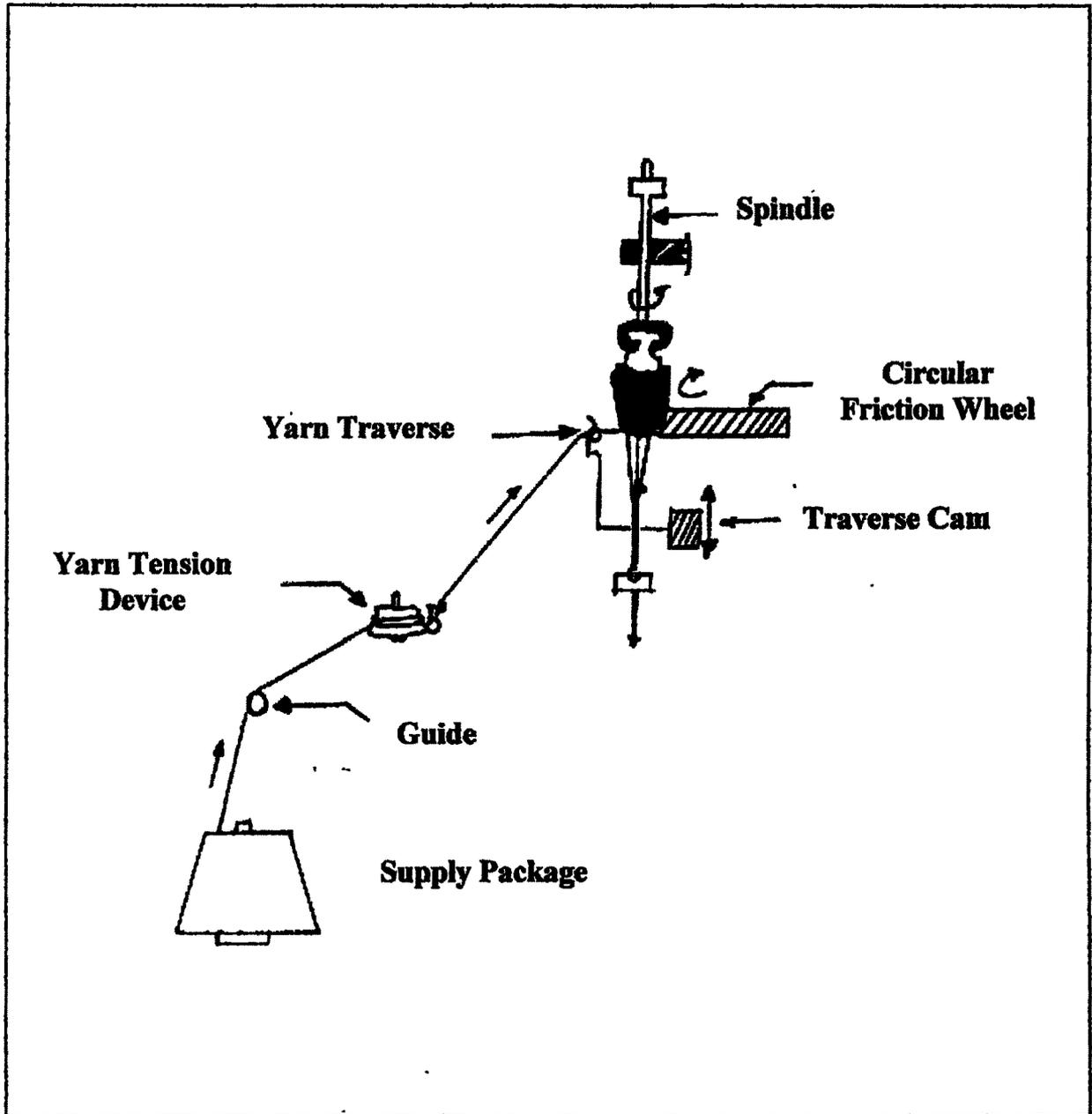
After drying of yarn hanks ~~yarn hanks~~ are transferred on flanged bobbins (in case of warp) and on cones (in case of welf) with the help of winding machines.

• Pirn Winding

In case of welf yarn, the cones are transferred to pirns on circular or horizontal pirn winding machines.

FIG. No. 6.1

VERTICAL SPINDLE CIRCULAR PIRN WINDING



6.10 WARPING

This process is carried out for warp yarn only. In this process- flanged bobbins having different colours of yarn are arranged as per the design of chaddars and towels on creel machine. The yarn is transferred on drum and then to beams. The yarn is received from the mill in the form of either single or double yarn. If the yarn is received as double yarn the first two stages of doubling and reeling are eliminated.

(a) Bhingari Warping

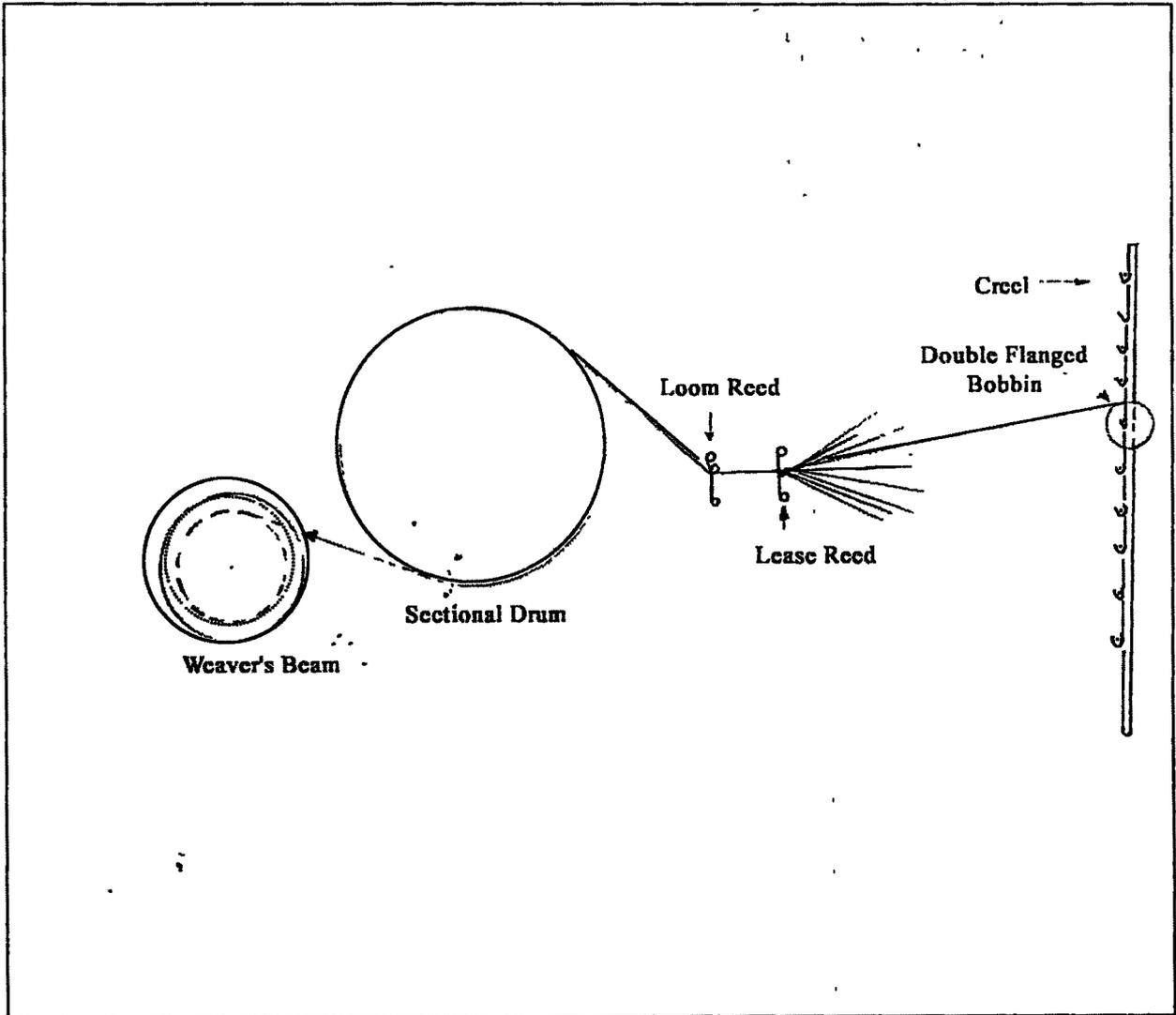
The yarn in the form of Bleached or Dyed hank form is converted in to the bhingari suitable for sectional warping the yarn is taken form hanks and through the guides wound on bhingari winding. It is just a physical transformation of hank yarn in to bhingari yarn.

(b) Sectional Warping

Weaver's beam is prepared on sectional wrapping-cum-beaming machine from parallel wound double flanged wrapper's bobbin in the creel. In usual machines it has a capacity to hold about 400 bobbins. These machines do not have brake motion. It warps at about 75 yarns per minute and the production of the machine varies from 2000 – 3000 yarns per shift depending on the need. The ground beam and extra beams are of about 1200 meters length.

FIG. No. 6.2

SECTIONAL WARPING MACHINE



6.11 WEAVING

In this process two beams are attached to powerloom. These beams are used for warp and pirn in shuttle is used for weft made according to the design with the help of jacquard machine fitted over the loom.

6.12 CUTTING

After weaving, the product is taken out for cutting. In this process chaddars and towels are made as per standard size. There are different sizes for chaddars and towels.

6.13 FINISHING

In this, the checkers inspect product and stitching the towel borders does finishing. Ultimately they are folded.

6.14 BUNDING AND BALE PACKING:

The folded pieces are then banded in 6 to 12 pieces each for terry towels and 5-piece case of chaddars. Then bale is packed. One bale contains 50 to 100 chaddars i.e. 10 to 20 bundles and for terry towel 10 to 20 dozens are baled together. These bales are then dispatched through

transport agent in case of domestic market and by C and F agent for exports⁸.

6.15 WELF PREPARATION

Mostly 36-spindle vertical spindle pirn. The pirns are rotated by surface contact of the revolving wheel. The supply package has to be cone only. Therefore, if bleached hank on drum winding machine and then used to make pirn on the machine. The drum winding used is very crude and does not have any stop motion.

The jacquard chadders contain large no of colours. In jacquard chaddars the ground beam yarn is either blended or dyed. The repeat size of the notify varies from 5" to 15" in length. Some percentage of chaddars is produced in full figures. The jacquard chadders are classified on the basis of colour as well as weight as follows:

- a. Janata – 700 to 900 gms.
- b. Deluxe – 1000 to 1100 gms.
- c. Mayurpankh – 1100 to 1400 gms.

Most of the factories use 23/205-hank yarn for ground as well as extra warp. 105 yarns do not find much favour because chaddar made from it has harsh feeling price compared to the chaddar from 2/205-ring yarn⁹.

The details of construction of chaddar are as follows.

- i. Count of ground warp : 20/2
- ii. Count of extra warp : 14/2
- iii. Count of welf : 4/1, 6/1, 10/1, and 14/1.
- iv. Reed : It varies from 4/22s to 4/30s, 4/26s are most commonly used.
- v. Picks/weight : 24 to 36 are common depends on the construction.
- vi. Size : Various sizes of chaddar are being produced depending on the end use. The most Common sizes used are 54-90 and 60-90.

6.16 LABOUR FORCE

Any chaddar manufacturing unit is a complex set-up where different people work together and some under one roof and some at servicing industry. Number of workers required for processing of yarns (for a unit of 12 looms), is given below.

(a) Skilled Workers

Two dyers are required for weighing the dyes, chemicals and fixing the re-crepe and controlling the process and flow of the yarn from wetting to drying. These workers are required for processing of grey

yarn and converting the same into dyed veels and drying. The number of workers for conversion of dyed are into chaddars is given below:

Table No. 6.1

Number of Workers for Dyed into Chaddars

Sr. No.	Particular	Number of Worker
1	Doubling m/c siders	07
2	Reeling operators	01
3	Reels to bhangari winders	04
4	Warpers	01
5	Weavers	12
6	Jobber for looms	01
7	Mending and checking workers	02
Total		28

(Complied by the researcher)

(b) Unskilled

i) Begaris required for transportation of cones, hank, wrapper bobbins,

Weavers beams, Cloth rollers etc. - 2

ii) Oilers cum cleaners - 1

iii) Pirm winders - 4

Administration: Supercisior / manager - 1

Clerk / Accountant - 1

The service industry includes the skilled people who work for the preparation of the design papers (designers), card cutting, card lacing (lacers), harness dressing and buiding, drawers and for knotting of beams (knotters). Such skilled person work on contract basis⁶.

6.17 WAGE STRUCTURE

There are two types of wage structures:

(a) Piece Work Basis

Bleaching and dyeing	:	Rs. 200/- to Rs 300/ 100 kg.
Warping	:	Rs. 150/- beams of 900 yards.
Weaving	:	Rs. 8 to 10 per chaddar.
Bhingari winding	:	Rs. 5 to 7 for 5 kg.

(b) Monthly basis :

Jobber	:	Rs. 6000/-
Fitter	:	Rs. 5000/-
Lacing boy	:	Rs. 1500/-
Pirn winders	:	Rs. 1200/-
Packing boy	:	Rs. 1400/-
Watchman	:	Rs. 1500/-

(Source: Mr. Rangnath Kshirsagar by the researcher Interview May 2003¹⁰.)

6.18 SUMMARY

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